МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

НАУКОВИЙ ВІСНИК

МУКАЧІВСЬКОГО ДЕРЖАВНОГО
УНІВЕРСИТЕТУ

СЕРІЯ
«ЕКОНОМІКА»

Науковий журнал

ТОМ 11, № 4
2024

МУКАЧЕВО
2024

ISSN 2313-8114
E-ISSN 2518-1254

Рішення Національної ради України
з питань телебачення і радіомовлення № 1564,
протокол № 15 від 09 травня 2024 року.
Ідентифікатор медіа - R30-04571.

Рекомендовано до друку та поширення
через мережу Інтернет Вченою радою
Мукачівського державного університету
(протокол № 8 від 27 грудня 2024 року)

Журнал входить до переліку наукових фахових видань України
Категорія «Б». Спеціальності: 051 – Економіка; 071 – Облік та оподаткування;
072 – Фінанси, банківська справа та страхування; 073 – Менеджмент;
075 – Маркетинг; 076 – Підприємництво, торгівля та біржова діяльність;
281 – Публічне управління та адміністрування
(Наказ Міністерства освіти і науки України № 1643 від 28.12.2019 р.)

Журнал представлено у міжнародних наукометричних базах даних, репозитаріях та пошукових системах:
Scopus, Web of Science, Google Scholar, Фахові видання України, Національна бібліотека України імені В. І. Вернадського, EconBiz, ERIH PLUS, DOAJ, Polska Bibliografia Naukowa, UCSB Library, Dimensions, German Union Catalogue of Serials, University of Oslo Library, University of Hull Library, SOLO - Search Oxford Libraries Online, European University Institute, Leipzig University Library, Cambridge University Library,
OUCI (Open Ukrainian Citation Index), WorldCat

Науковий вісник Мукачівського державного університету. Серія «Економіка» / Ред. кол.: Т.В. Шталь та ін. – Мукачево: Вид-во МДУ, 2024. – Том 11, № 4. – 161 с.

Засновник і видавець:
Мукачівський державний університет
89600, вул. Ужгородська, 26, м. Мукачево, Україна
E-mail: info@economics-msu.com.ua
https://economics-msu.com.ua/uk

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SCIENTIFIC BULLETIN

OF MUKACHEVO STATE UNIVERSITY

SERIES "ECONOMICS"

Scientific Journal

VOL. 11, No. 4
2024

MUKACHEVO
2024

ISSN 2313-8114
E-ISSN 2518-1254

Decision of the National Council
of Television and Radio Broadcasting of Ukraine No. 1564.
Minutes No. 15, dated 09.05.2024.
Media identifier - R30-04571.

Recommended for printing and distribution
via the Internet by the Academic Council
of Mukachevo State University
(Minutes No. 8 of December 27, 2024)

The journal is included in the list of scientific professional publications of Ukraine
Category "B". Specialties: 0311 – Economics; 0411 – Accounting and taxation;
0412 – Finance, banking, and insurance; 0413 – Management and administration;
0414 – Marketing and advertising
(Order of the Ministry of Education and Science of Ukraine No. 1643 of 28.12.2019)

The journal is presented at international scientometric databases,
repositories and scientific systems:
Scopus, Web of Science, Google Scholar, Professional publications of Ukraine, Vernadsky National Library of Ukraine, EconBiz, ERIH PLUS, DOAJ, Polska Bibliografia Naukowa, UCSB Library, Dimensions, German Union Catalogue of Serials, University of Oslo Library, University of Hull Library, SOLO - Search Oxford Libraries Online, European University Institute, Leipzig University Library, Cambridge University Library, OUCI (Open Ukrainian Citation Index), WorldCat

Scientific Bulletin of Mukachevo State University. Series "Economics": / Editorial Board: T. Shtal *et al.* – Mukachevo: MSU Publishing House, 2024. – Volume 11, No. 4. – 161 p.

Founder and publisher:
Mukachevo State University
89600, 26 Uzhhorodska Str., Mukachevo, Ukraine
E-mail: info@economics-msu.com.ua
https://economics-msu.com.ua/en

НАУКОВИЙ ВІСНИК МУКАЧІВСЬКОГО ДЕРЖАВНОГО УНІВЕРСИТЕТУ
СЕРІЯ «ЕКОНОМІКА»
Том 11, № 4. 2024

SCIENTIFIC BULLETIN OF MUKACHEVO STATE UNIVERSITY
SERIES "ECONOMICS"
Vol. 11, No. 4. 2024

ЗМІСТ

CONTENTS

Scientific Bulletin
of Mukachevo State University
Series
Economics

Volume 11, No. 4, 9-26
Journal homepage: https://economics-msu.com.ua/en

UDC 378.147:339.9
DOI: 10.52566/msu-econ4.2024.09

Financial and economic approaches to pedagogical monitoring in higher education: Quality assurance through green economy principles

Dzhyldyz Albanbaeva*
Senior Lecturer
Kyrgyz State University named after I. Arabaev
720026, 51A Razzakov Str., Bishkek, Kyrgyz Republic
https://orcid.org/0000-0003-3558-7107

Zhibek Amerkulova
Senior Lecturer
Kyrgyz State University named after I. Arabaev
720026, 51A Razzakov Str., Bishkek, Kyrgyz Republic
https://orcid.org/0009-0006-5416-167x

Asylkan Sharsheeva
Senior Lecturer
Kyrgyz State University named after I. Arabaev
720026, 51A Razzakov Str., Bishkek, Kyrgyz Republic
https://orcid.org/0000-0008-6536-045x

Aigul Chaldanbaeva
Doctor of Pedagogical Sciences, Professor
Kyrgyz State University named after I. Arabaev
720026, 51A Razzakov Str., Bishkek, Kyrgyz Republic
https://orcid.org/0009-0003-8107-2697

Rustambek Asanov
PhD in Economics
Kyrgyz State University named after I. Arabaev
720026, 51A Razzakov Str., Bishkek, Kyrgyz Republic
https://orcid.org/0009-0005-0166-9229

Received: 20.08.2024, Revised: 29.11.2024, Accepted: 27.12.2024

Suggested Citation: Albanbaeva, D., Amerkulova, Zh., Sharsheeva, A., Chaldanbaeva, A., & Asanov, R. (2024). Financial and economic approaches to pedagogical monitoring in higher education: Quality assurance through green economy principles. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 9-26. doi: 10.52566/msu-econ4.2024.09.

*Corresponding author

Abstract. The purpose of this study was to cover the financial and economic approaches to monitoring for the green economy integration in the educational process. The study analysed the financial and economic aspects of pedagogical monitoring and their role in the implementation of green economy in higher education. The relationship between sustainable development and green economy was covered and the impact of green economy on the educational process was examined. The study defined the financial and economic methods of monitoring: cost and profitability analysis, resource optimisation, benchmarking, budgeting, calculation of key performance indicators, modelling. The study explored the degree of implementation of green economy principles in the educational process of Kyrgyzstan, Kazakhstan, and Uzbekistan. To assess the real practices in higher education institutions, the opinion of teachers and students at the Kyrgyz State University named after Ishenaly Arabaev, Almaty Humanitarian-Economic University, Tashkent State Economic University was analysed. The findings showed that the universities under study actively implement environmental projects and initiatives related to sustainable development and green economy. Furthermore, the principles of green economy are integrated into educational programmes. However, the effectiveness of monitoring the educational process was low. Financial and economic barriers in monitoring and implementation of green economy in the educational process were also found, namely: lack of material and technical support (45%), limited opportunities to use innovative technologies (35%), low motivation of students to implement the principles of green economy (32%). There are also barriers in the practical training of future specialists to implement the green economy principles. For more effective practical training of students and to improve the effectiveness of green economy, it was proposed to introduce into the educational process the cooperation with educational institutions and public organisations, project-based learning, to organise trainings and courses, as well as to leverage information and communication technologies. A monitoring model was proposed based on financial and economic approaches, which includes the stages of planning, diagnostics, and the stage of strategy development, which can influence the objectivity of evaluation of the educational process through the lens of green economy

Keywords: sustainable development; environmental initiatives; education program; innovative methods; training of specialists

Introduction

The key areas in the development of the state include the improvement of the quality of life and well-being of the population. The growth of economic efficiency of the state can contribute to the improvement of the quality of life by increasing the number of jobs, infrastructure development, and technological advancement. However, in some cases, economic development may be accompanied by a series of environmental problems: pollution and depletion of natural resources, ecosystems, and climate change. In the modern world, apart from economic development, a competitive state strives to preserve and conserve natural resources and ecosystems, which is also important for improving the quality of life. This necessitates the introduction of a new area - green economy - in all spheres of the state's activity.

Increasing the environmental responsibility of the population is possible through the educational sphere, particularly through training at the university (Onyshchenko & Serdiuk, 2023). The relevance of this study was determined by the fact that it is through education that the principles of green economy can become a way to promote environmental culture and a method of preparing future specialists for environmental and economic challenges of future activities. This indicated the need to search for new, specifically financial and economic, approaches to monitoring in the educational process. J.O. Odiyo *et al.* (2022) discussed the role of green economy in the system of higher education. The researchers investigated the need to pass on the existing knowledge to the next generations as a method of developing environmental culture. S. Dibra *et al.* (2022) analysed the role of universities in training specialists to implement the principles of green economy.

Higher education is the social institution where future specialists of all sectors develop knowledge and skills necessary to advance their field of activity (Yevseiev *et al.*, 2020). Professionals familiar with the principles of green economy can contribute to sustainable development, well-being, and quality of life. To train environmentally responsible professionals, it is necessary to promote compliance with the principles of green economy by educators and students (Dolhikh, 2024). However, in the implementation of green economy principles in the educational process, there are such difficulties as ineffective educational programmes, lack of necessary skills of teachers and students to implement green economy principles. This requires regular assessment of the quality of the educational process and evaluation of compliance of educational programmes with modern requirements and principles of green economy. Such assessment can be performed through pedagogical monitoring, which will be more effective based on financial and economic approaches.

K. Sushil *et al.* (2024) analysed financial and economic approaches in higher education and sustainable development. The researchers investigated the concept of green finance in monitoring system. U.S. Ahmad *et al.* (2024) studied the relationship between financial aspects and sustainable development. X. Zhang *et al.* (2024) discussed the relationship between education and economy. Financial and economic approaches are essential to implement

the goals of pedagogical monitoring through the lens of green economy. These approaches can improve the quality of monitoring of the educational process. This can positively influence sustainable development and contribute to the balance between economic growth and environmental preservation. The use of financial and economic approaches in monitoring the quality of the educational process can help to evenly distribute resources aimed at its improvement. Thus, by channelling financial investments into environmental and economic projects, educational institutions create an environment for training competitive specialists who will be catalysts for the development of the state. Central Asian countries such as Kyrgyzstan, Kazakhstan, and Uzbekistan cooperate closely, particularly in the education sector. Furthermore, these countries, due to their location, face comparable environmental challenges that require the introduction of green economy principles.

Thus, B.K. Kaldybaev *et al*. (2022) investigated aspects of green economy in Kyrgyzstan. Kyrgyzstan's priority is to improve the health of the population and their quality of life, which can be achieved by preserving the environment. The government of Kyrgyzstan plans a phased restoration of ecosystems, which will ensure a higher quality of life and sustainable development. The transition to a green economy also affects the educational sphere of Kyrgyzstan. Higher education prepares specialists who can manage global environmental and economic challenges and fulfil their professional activities for the benefit of society. G.T. Shakulikova & S.S. Shakulikova (2021) covered the role of green economy in sustainable development of Kazakhstan. The government of Kazakhstan strives to meet international environmental requirements. The transition to a green economy is expected to improve the quality of life of the population, preserve natural resources, and build a sustainable society. A. Mikhailov *et al*. (2023) investigated the specific features of green economy development in Uzbekistan. The priority areas of Uzbekistan include the modernisation of economic and environmental sectors, which will preserve social stability and promote sustainable development.

Green economy is a major area of modern economic sector, which promotes the development of society and improves the quality of life of the population, while preserving natural resources and ecosystems (Kyfyak *et al*., 2024). Introduction of green economy elements into the educational process is an essential part of preparing the younger generation for effective professional activity. Kyrgyzstan, Kazakhstan, and Uzbekistan are actively implementing the principles of green economy, but the role of higher education in this process is not sufficiently analysed. The quality of the educational process in the above countries through the lens of green economy has not been analysed and the financial and economic features of pedagogical monitoring have not been covered. Proceeding from this, the purpose of this study was to determine financial and economic approaches to monitoring to improve the quality of the educational process through the lens of green economy. Objectives of the study: to analyse the implementation of green economy in the educational process of Kyrgyzstan, Kazakhstan, and Uzbekistan; to explore approaches to improving the effectiveness of green economy in higher education; to propose a model of pedagogical monitoring considering financial and economic approaches to effectively assess the implementation of green economy principles.

Materials and Methods

This study evaluated the educational process of Central Asian universities through the lens of green economy. The study included two stages: theoretical and empirical. The term 'green economy' was analysed, and its principles were explained, which was necessary to determine its role in all spheres of state activity. To confirm the relationship between the educational process and green economy, its influence on the training of specialists was analysed. Based on the information obtained, using synthesis, the relationship between the sustainable development, educational process, and economic growth was analysed.

The study covered the financial and economic approaches to pedagogical monitoring, as well as its role, stages, and methods in the system of higher education. At this stage of the study, regulations were analysed, including "On the Concept of the Transition of the Republic of Kazakhstan to a "Green Economy" (2013); the Concept of the green economy in the Kyrgyz Republic "Kyrgyzstan – A country of green economy" (2018); the Resolution of the President of the Republic of Uzbekistan "On Measures to Improve the Effectiveness of Reforms Aimed at the Transition of the Republic of Uzbekistan to a "Green" Economy by 2030" (2022). Analysis of these documents was used to synthesise the information obtained to assess the specific features of introducing the green economy in the countries of Central Asia. Analysis and synthesis of regulations helped to define the aspects requiring further research. To obtain more information regarding the monitoring of the educational process, the second stage of this study involved a survey among the educators and students of the Kyrgyz State University named after Ishenaly Arabaev, Almaty Humanitarian-Economic University, and Tashkent State Economic University. These educational institutions were selected based on the following criteria: implementation of the green economy principles in the education process and active international interaction, which was essential to organise such a study.

55 educators took part in the study – lecturers of the faculties of economy, as well as 160 students majoring in economy (60 students), digital economy (55 students), and finance (45 students). The age of the educators under study was within 30-35 years, while their professional experience was within 5-30 years. The age of the surveyed students was within 19-26 years, and their year of study was from 2nd to 5th. The sample of the survey subjects was formed randomly among those educators and students who had experience of interaction with green economy in the educational process. The study employed a specifically designed questionnaire aimed at analysing the quality of the educational process (Table 1). The participants of the study were informed

about the purpose of the survey, gave their consent to take part in it and to process their personal data. The participants were also informed that their answers would not influence their academic performance (for students) and professional development (for educators), which increased the objectivity of the results obtained. The research complied with the ethical standards specified in European Commission on ethics and data protection (2021).

Table 1. Questionnaire to determine the quality of the educational process through the lens of green economy

No.	Statement	Answer	
		Yes	No
1	I am familiar with the term "green economy"		
2	I am familiar with the principles of green economy		
3	The green economy principles are being integrated into the educational process of my institution		
4	The educational process of my institution provides a quality theoretical basis for the green economy principles.		
5	The educational process of my institution provides a qualitative practical basis for the green economy principles.		
6	In the educational process of my educational institution practical projects based on the green economy principles are implemented		
7	Various environmental initiatives are supported within my educational institution		
8	The administration of my educational institution promotes the implementation of green economy principles in the educational process		
9	The quality of the educational process is regularly monitored at my educational institution		
10	Financial and economic aspects are considered in the monitoring process		
11	Modern methods are used in the monitoring process		
12	In my opinion, financial and economic approaches can influence the quality of the educational process		
13	In my opinion, financial and economic factors influence the integration of green economy principles into the educational process		
14	The administration of my educational institution facilitates monitoring of the educational process		
15	My educational institution regularly makes changes in the educational process based on the monitoring conducted		
16	My educational institution makes rational use of financial resources to improve the educational process		
17	International cooperation is being implemented within the framework of my educational institution		
18	My educational institution uses innovative information and computer technologies, particularly in the implementation of the green economy principles		
19	In my opinion, the green economy principles positively influence the educational process and the quality of training of future specialists		
20	The educational process of my higher education institution contributes to the development of ecological principles		

Source: created by the authors

The questionnaire included 20 statements to which teachers and students had to answer "Yes" or "No". To confirm or refute the results obtained, an additional interview with 25 experts in the field of green economy and educational process monitoring was conducted. These experts included representatives of environmental NGOs that cooperate with the studied higher education institutions, the management of higher education institutions, teachers who had experience in working with the concept of green economy. The interview included the following questions:

1. How effective is monitoring the quality of the educational process through the lens of the green economy?

2. Can financial investments improve the pedagogical monitoring process and how?

3. What financial and economic barriers exist in the pedagogical monitoring process?

4. What barriers exist in the implementation of green economy in the educational process?

The final stage was a comparative analysis of the findings of the study for each of the educational institutions. This helped to understand the specific features of monitoring of the educational process, as well as aspects of introducing the principles of green economy in the educational process in each of the educational institutions. The criteria for comparative analysis included greening of educational programmes, availability of practical projects on sustainable development and environmental initiatives, availability of pedagogical monitoring, its quality and methods, the degree of involvement of educators and students in the implementation of green economy principles. The obtained information was used to identify key areas for improving the quality of the educational process and training of specialists.

Results

In modern society, the activities of the state and its branches are aimed at economic development, improving the well-being of the population, increasing life expectancy, and harmonious development of the younger generation. One of the areas for the fulfilment of these goals includes the use of an ecological approach in all sectors, which

implies saving natural resources and ecosystems by reducing emissions into the environment, creating green infrastructure, waste management, and switching to renewable energy sources. It is vital to introduce such an approach in the educational sphere, as the transition to new environmental and economic models requires the development of environmental culture and responsibility in the younger generation. Proceeding from this, it is advisable to use the principles of green economy, which is aimed at improving the quality of life of the population and the use of environmental approaches in all sectors. This study considered green economy as an ecological and economic concept, the implementation of the principles of which contributes to sustainable development. Green economy is based on the principles of rational use of natural resources, ecosystem conservation, as well as on the principles of "eco-inclusiveness" and "eco-adaptability".

The principle of rational use of natural resources implies their preservation for the next generations by protection from pollution, by transition to a closed cycle of production (when all materials and resources are reused), by forming a responsible attitude towards natural resources among the population (popularisation of reusable goods and resources, popularisation of waste sorting). In the educational process, this principle can be implemented by improving energy efficiency (installation of energy-saving lamps, solar panels, automatic light switch-on/off systems); by switching to electronic documentation and e-learning materials; by reusing materials and equipment.

The principle of ecosystem conservation implies preserving those ecological systems that are necessary for the life of the population, for example: preserving water bodies and cleaning them; preserving clean air (e.g., by planting new green spaces); and preserving soil fertility. The principle of preserving ecosystems may include the preservation of biological diversity: flora and fauna. This is possible through the creation of nature reserves and protected areas, through the protection of endangered species. In the educational process, this principle can be implemented by sorting waste, creating "green" corners, and landscaping the educational territory; by interacting with public environmental organisations, which will initiate 'green' initiatives (cleaning parks and forest parks, cleaning water bodies).

The principle of eco-inclusiveness implies equal environmental opportunities for all segments of the population. For example, residents of large cities and residents of remote villages should receive the same quality of natural resources necessary for their livelihoods. Furthermore, all social groups, regardless of their economic status, place of residence and other criteria, should be provided with equal working conditions following ecological and health-saving principles. In the educational process, this principle can be implemented through equal access of students to environmental education; through equal access to the results of monitoring the educational process; through compliance with hygienic norms of the educational process organisation for all its participants; through the development of "green" infrastructure in the educational institution (Mohamed *et al*., 2024).

The principle of eco-adaptability implies sustainable development of all state sectors, regardless of external factors: climate change and natural disasters. Changes, especially in the modern world, where globalisation and modernisation processes take place, are inevitable, which requires the development of such approaches to environmental and economic challenges that will always be relevant. In the educational process, this principle can be fulfilled through regular monitoring; through the formation of students' "flexible" knowledge and skills that they can apply regardless of the changes occurring in society. The principles of green economy demonstrate the need for responsible attitude towards natural resources, preservation of ecosystems and biodiversity, the need to create equal environmental and economic conditions for all and the significance of developing flexible environmental approaches. The implementation of these principles can improve the environmental situation and contribute to sustainable development. However, the implementation of green economy principles requires a comprehensive approach and involvement of all government sectors at all levels.

Thus, implementation of green economy principles in the educational process is part of sustainable development and preparation of specialists for environmental and economic challenges of professional activity. Higher education institutions train specialists in various sectors. Environmentally responsible specialists, who can apply the acquired knowledge and skills, will be able to implement the principles of green economy in their fields of activity, thus evenly developing the state and its sectors. Furthermore, higher education institutions can train representatives of new specialities necessary for ecological-economic and sustainable development, for example: environmental auditor, climate analyst, urbanist, environmental law specialist, closed-cycle production developer, etc. Research and development work in universities can become the basis for environmental innovations and innovative approaches to the implementation of green economy principles. The implementation of green economy principles in the educational process affects not only the quality of training of specialists, but also the overall atmosphere of the educational process. Thus, environmental projects and initiatives can influence the interaction of all participants of the educational process, improve their morale and health. This suggests that higher education and green economy are interrelated and complementary and affect sustainable development.

Sustainable development is considered as a concept in which natural resources, economic reforms, and other governmental and societal processes are closely interconnected and form opportunities to meet the needs of society (Ponomarenko & Pysarchuk, 2024). Sustainable development affects economic processes as much as they affect it. Green economy also ensures the economic development of the state while preserving natural resources and

ecosystems. Thus, green economy cannot exist separately from sustainable development, as it forms part of the environmental management system, contributes to sustainable progress, and can promote sustainable (especially economic) development (Wang *et al*., 2024). Hence, green economy is, arguably, a part of sustainable development. Thus, higher education, and the changes taking place in it, are closely interrelated with economic development and green economy, and are components of sustainable development. Quality training of future specialists considering the principles of green economy, implementation of eco-economic projects and initiatives in the educational process, introduction of ecological elements into the curricula will contribute to sustainable development, improve the quality of life of the population, and help to preserve the environment, natural resources and ecosystems, and pass them on to the next generations.

However, to support sustainable development and improve the performance of the green economy, it is necessary to conduct regular monitoring of the educational process. It demonstrates to what extent certain principles of green economy are implemented in the educational institution, how effective the educational programmes are, and how relevant the methods and approaches used are. Monitoring allows controlling the quality of the educational process, improving it based on the received information, changing methods and approaches, depending on the needs of its participants. Monitoring is cyclical and includes three stages: diagnostic, prognostic, and formative.

The diagnostic stage is aimed at identifying existing problems in the educational process, assessing the knowledge and skills of students regarding green economy and its principles. At this stage training programmes, methods, and approaches used are evaluated, and their effectiveness is assessed. Within the framework of the predictive stage, based on the obtained information, a strategy is developed, which is aimed at eliminating the identified problems or improving the effectiveness of the existing strategy. At this stage, the future results of students in the educational process are predicted, which are anticipated based on the changes introduced. The formative stage is aimed at developing the necessary knowledge and skills of students regarding the green economy and at implementing environmental initiatives. After the formative stage (at the end of the academic year/semester), the diagnostic stage is conducted again, which is aimed at assessing the updated/improved strategy for the implementation of green economy principles and, if necessary, its further adjustment according to the subsequent monitoring stages. Modern monitoring should be based on financial and economic approaches, as qualitative changes in the educational process require optimisation of resources and rationality of their use. Financial and economic approaches to pedagogical monitoring can include cost and profitability analysis, resource optimisation, and benchmarking.

Cost and profitability analysis is based on the assessment of the costs of the educational process and their correlation with the results obtained. This approach assesses the costs that were necessary to implement educational programmes, projects, initiatives, and then analyses their effectiveness. This allows assessing the cost-effectiveness of the methods used and identifying the most effective approaches that required minimum costs. This approach to financial and economic monitoring helps to minimise unnecessary expenses and at the same time to introduce into the educational process only those methods that will be effective. Optimisation of resources is based on the maximum use of all available opportunities. It helps to effectively utilise existing resources to improve the quality of the educational process. This approach also aims to save natural resources and ecosystems, which is essential in the transition to a green economy. Benchmarking is based on the comparison of financial and economic indicators of an educational institution with equivalent educational institutions. This approach allows assessing how effective certain innovations are and calculating the cost-effectiveness of their use within the framework of the educational institution.

The analysed financial and economic approaches can help to avoid unnecessary expenses and direct existing resources to the implementation of effective educational programmes, practices, and initiatives. This can improve the educational process and increase the quality of training. However, to implement these approaches, the monitoring process should employ such economic tools as budgeting, calculation of KPIs (key performance indicators), and modelling. Budgeting is necessary to understand the financial and economic capabilities of an educational institution. It helps to control the costs necessary for the implementation of projects and initiatives, to determine which of them the university can afford to implement, and which will be financially unprofitable. Budgeting also influences the allocation of finances in the pedagogical monitoring process and in the implementation of changes based on it. KPI calculation is used to quantify the results of monitoring: time and resources spent on monitoring, total costs of implementing environmental projects and initiatives, and quantitative student learning outcomes. Modelling is necessary to consider all possible scenarios, which gives an understanding of the financial and economic consequences of monitoring and decisions taken during monitoring. Thus, modelling provides an insight into what losses an educational institution will incur in case of ineffectiveness of the chosen strategy and what the consequences may be. And conversely: modelling allows assessing what can be the positive results of the chosen strategies, specifically the financial and economic ones.

Financial and economic approaches to pedagogical monitoring allow making the assessment of the quality of the educational process more effective and increasing its efficiency in the conditions of implementation of the green economy. Transitioning to the principles of green economy, an educational institution should be based on the needs of its students, public demand, and the requirements of a modernised society. It is for the implementation of these

goals that higher education institutions should regularly monitor existing educational programmes. Furthermore, in implementing the principles of green economy in the educational process, the management of the educational institution should rely on the regulatory documents of the state. Thus, it is advisable to review the regulatory documents of Kyrgyzstan, Kazakhstan, and Uzbekistan for further consideration of the features of green economy in the educational process of these countries.

Kyrgyzstan's regulatory documents note that the old economic models are irrelevant and do not save natural resources, but on the contrary: they are based on their exploitation and depletion. Thus, Kyrgyzstan is striving for green thinking, green upbringing, and green education (Concept of the green economy..., 2018). In Kyrgyzstan, the greatest attention is paid to the introduction of the green economy in the educational sphere, which is aimed at the formation of environmental responsibility among citizens. Thus, Kyrgyzstan is aimed at the formation of 'green' thinking among the population, particularly students of higher education institutions, the use of the media to promote the principles of green economy among the population, the use of the 3R principle: Reduce, Reuse, Recycle. In terms of the 3R principle, "Reduce" means to reduce the consumption of natural resources; "Reuse" means to reuse goods/materials/resources; "Recycle" means to recycle household waste. This principle is aimed at saving natural resources and their conscious consumption, at preserving ecosystems.

To foster "green" thinking among the population, particularly students, Kyrgyzstan is actively introducing environmental courses that include learning about the environment (e.g., through excursions, environmental lessons, or entire environmental camps); developing specialised educational programmes; restoring conventional knowledge about nature, its resources, and ecology; publishing environmental literature (scientific, popular science, fiction, and methodological literature); and conducting and encouraging research activities. The use of the media includes the use of television, radio, newspapers, magazines, and social networks to promote the ideas of green economy and to develop knowledge and skills of the population regarding this concept.

Kazakhstan, for its part, is also committed to conserving the environment and natural resources. The government of Kazakhstan aims to transition to a new, more modern economic paradigm that can improve the quality of life of the population while preserving the environment. Kazakhstan's priorities include modernising infrastructure; reducing the use of natural resources while increasing the efficiency of the resources used; and creating public awareness of the principles of a green economy (On the Concept of the Transition…, 2013).

In Uzbekistan, approaches to promoting a green economy, as well as "eco-inclusiveness" and "eco-adaptability" are being implemented. Like Kyrgyzstan and Kazakhstan, Uzbekistan seeks to mitigate negative environmental impacts and to be more respectful of natural resources. The key priorities of Uzbekistan include the introduction of green technologies and innovations in all state sectors; creation of conditions for compliance with the principles of green economy in all sectors; implementation of environmental-economic initiatives and projects, specifically international ones; ensuring adaptability of the methods and approaches used; development of green infrastructure; introduction of educational environmental-economic elements, namely: seminars, trainings, courses on the principles of green economy, development of new curricula, preparation of new educational programmes, training of specialists in the field of green economy and sustainable development, and encouragement of research and development activities (Resolution of the President…, 2022). Thus, the analysed regulatory documents indicate that the government of the countries strives to improve the quality of life, to save natural resources and ecosystems, and to increase the environmental responsibility of citizens. However, the specifics of monitoring the educational process in these countries through the lens of green economy are not covered. Moreover, there are no studies on real educational practices in higher education institutions in Kyrgyzstan, Kazakhstan, and Uzbekistan. To obtain this information, a survey of educators and students of Kyrgyz State University named after Ishenaly Arabaev, Almaty Humanitarian-Economic University, and Tashkent State Economic University was conducted.

The results showed that 90% of surveyed educators (49 people) and 80% of students (128 people) are familiar with the term 'green economy'. 86% of surveyed educators (47 people) and 60% of students (96 people) are familiar with the green economy principles. This demonstrated that while the majority of educators and students know what green economy is overall, not all are familiar with its principles. This may affect the training of future specialists, as educators and students who are not fully informed about the green economy principles cannot qualitatively implement them in their activities and follow them. 75% of surveyed educators (41 people) considered that their educational institution integrates the principles of green economy into the educational process. Among students, 65% of the respondents (104 people) mentioned the integration of green economy principles into the educational programmes. Such findings could indicate that environmental and economic elements are not fully integrated into the educational process. This requires revision of educational approaches and methods of implementation of green economy principles. The distribution of integration of green economy principles into the educational process by educational institutions is presented in Figure 1. Among the surveyed students, 65% (104 people) concluded that they received a qualitative theoretical basis regarding the principles of green economy. Quality practical skills were received by 55% of the surveyed students (88 people). Educators, on the other hand, considered that students of their higher education institutions receive both qualitative theoretical and qualitative practical base.

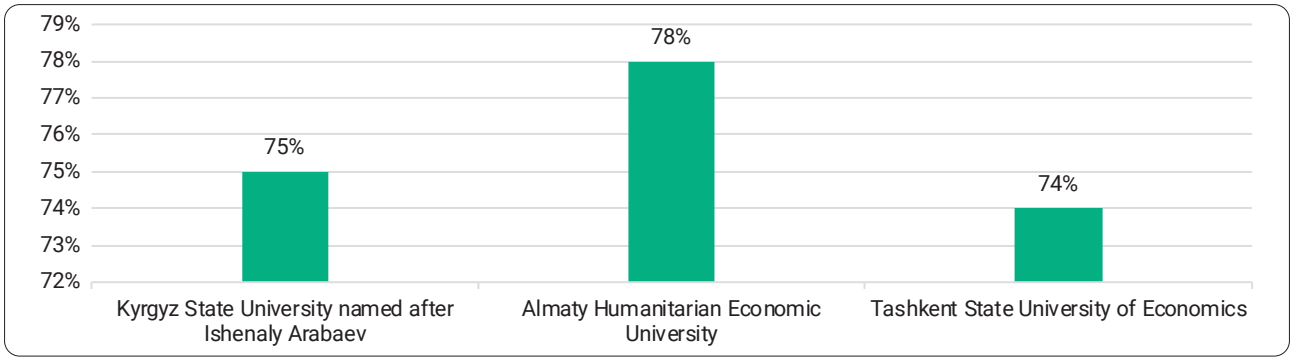

Figure 1. Degree of integration of green economy principles into the educational process
Source: created by the authors

Such findings may suggest that practical skills are not being practised at a sufficient level in the educational process. Such findings may also indicate irrelevant teaching methods, as educators believed that their students receive quality practical skills, while students do not fully agree. The distribution of the quality of theoretical and practical skills regarding the principles of green economy by educational institutions is presented in Figure 2.

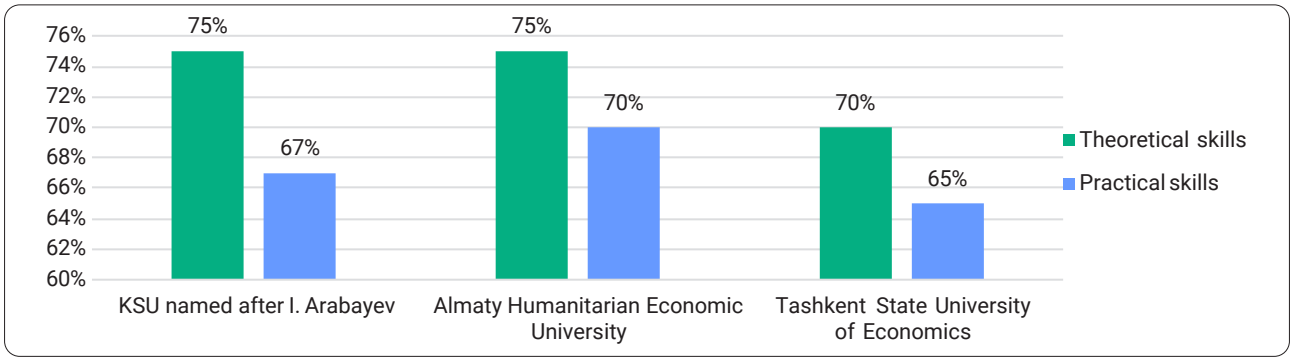

Figure 2. Level of development of theoretical and practical skills regarding the green economy principles
Source: created by the authors

Among the surveyed students, 65% (104 people) indicated that environmental projects are implemented at their institution, but only 50% of students (80 people) felt that various environmental initiatives are implemented at their institutions. Such findings may suggest that students have not formed a correlation between green economy and environmental problem solving. This may demonstrate the need for classes/seminars/trainings to develop environmental responsibility among students. Among the educators, 87% of the respondents (48 people) indicated that the administration promotes the implementation of green economy principles in the educational process, the same opinion was held by 85% of students (136 people). This demonstrated the strong involvement of the administration of educational institutions in the implementation of green economy principles and their promotion of environmental projects and initiatives. 76% of teachers (42 people) and 65% of students (104 people) noted that innovative information and computer technologies are used within their educational institutions. 95% of teachers (52 people) and 87% of students (139 people) considered that international interaction is implemented within their educational institution. Such findings indicated that Kyrgyz State University named after Ishenaly Arabaev, Almaty Humanitarian-Economic University, and Tashkent State Economic University factor in the green economy principles in the educational process. Both educators (80% or 44 people) and students (74% or 118 people) concluded that environmental principles are implemented in the educational process. The distribution of opinions on this issue by educational institutions is presented in Figure 3.

80% of educators (44 people) noted that their educational institution regularly monitors the quality of the educational process, but only 70% of educators (38 people) thought that the monitoring process considers financial and economic aspects. 75% of educators (41 people) noted that modern methods are used in the monitoring process in their educational institution. This may suggest the need to revise monitoring methods and search for new financial and economic approaches to their implementation. 80% of educators (44 people) considered that the administration of the educational institution facilitates monitoring, which indicates that the university administration is involved in improving the educational process. However, only 60% of

surveyed educators (33 people) noted that their educational institution regularly makes changes in the educational process based on the monitoring. Such findings could suggest that the monitoring of the educational process is insufficiently effective and does not cover the needs of teachers and students, which requires a revision of approaches to it. Distribution of opinions on this issue by educational institutions is presented in Figure 4.

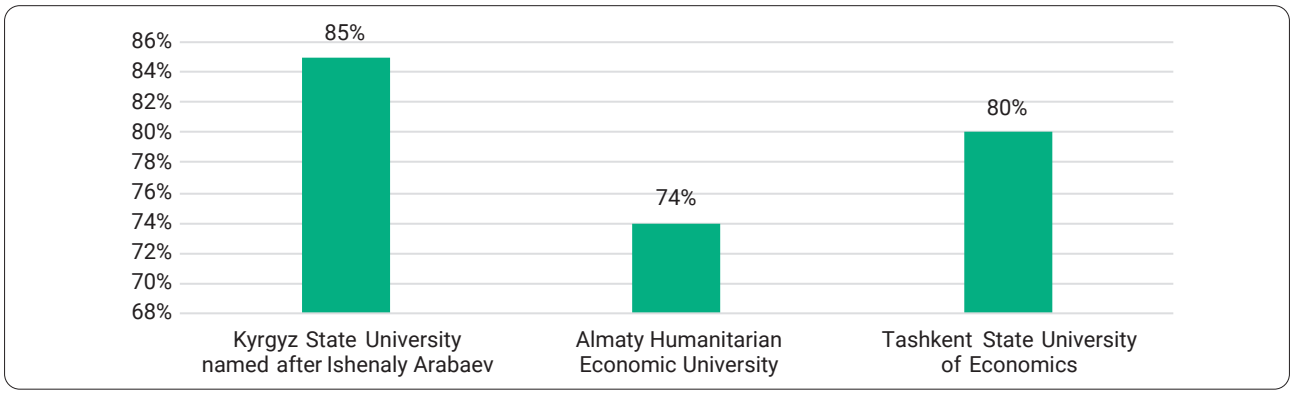

Figure 3. Level of promotion of environmental principles by educational institutions
Source: created by the authors

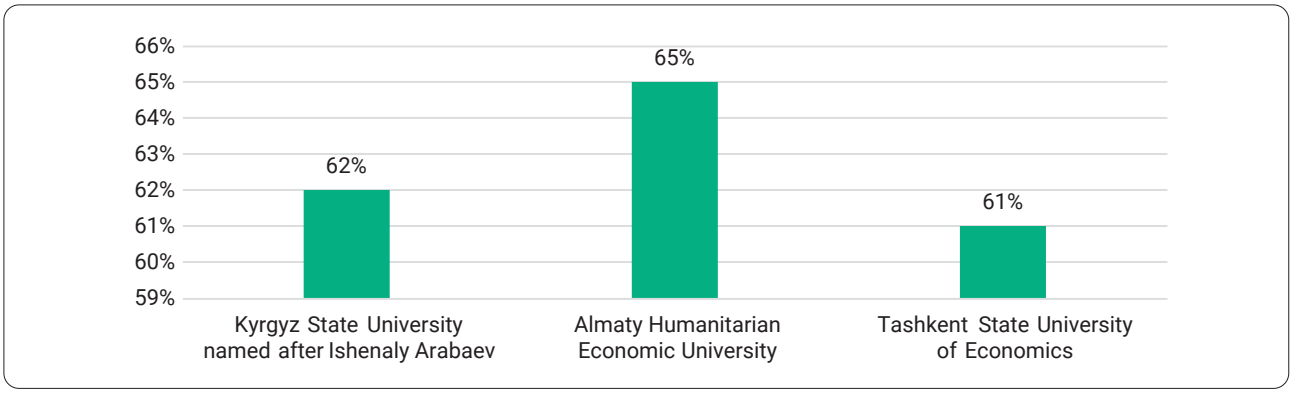

Figure 4. Evaluation of monitoring performance by educational institutions
Source: created by the authors

Thus, in all the higher education institutions under study, the principles of green economy are implemented at approximately the same level, but in different areas. In the Kyrgyz State University named after Ishenaly Arabaev, projects related to sustainable development and, specifically, green economy are implemented; in Almaty Humanitarian and Pedagogical University green economy principles are actively integrated into the curriculum; in Tashkent State Economic University, environmental-economic and environmental-pedagogical initiatives and projects are implemented. In terms of pedagogical monitoring mechanisms in the higher education institutions under study, educators at all universities note the presence of monitoring and its considerable effectiveness. However, the factual results showed that pedagogical monitoring is insufficiently effective, because based on its results, no changes are introduced into the educational process, or these changes are insignificant. Furthermore, the low level of use of financial and economic approaches and modern technologies was noted in the monitoring process, which reduces its effectiveness. The findings of the study also showed that in all the higher education institutions surveyed, theoretical knowledge of green economy and environmental challenges is formed more qualitatively than practical knowledge, which may indicate barriers in the educational process and lack of methods for practical development of knowledge. In the future, this may affect the ability of graduates to implement green economy principles in their professional activities. To confirm or refute these findings, interviews were conducted with experts in the field of green economy at each of the universities under study. The interviews demonstrated that the principles of green economy in the higher education institutions surveyed are implemented mainly through the introduction of environmental projects and initiatives and by encouraging research and development work in this area.

According to all interviewed experts, financial and economic approaches and investments can improve the quality of pedagogical monitoring and, as a result, the quality of the educational process through the lens of green economy.

The experts attributed the effectiveness of monitoring in the implementation of green economy principles to the ability to predict the results of environmental initiatives and projects, selected strategies, and financial and economic approaches in monitoring will help to avoid unnecessary costs and irrational use of existing resources. Based on the interviews, a comparative analysis of the quality of implementation of green economy principles in the educational process and the quality of pedagogical monitoring was performed (Table 2).

Table 2. Comparative characterisation of the quality of green economy implementation in the educational process and the quality of pedagogical monitoring, based on the conducted interview

Criterion	Educational institutions		
	Kyrgyz State University named after Ishenaly Arabaev	Almaty Humanitarian-Economic University	Tashkent State Economic University
Greening of curricula	Ecological elements are introduced into the teaching of disciplines, subjects directly related to green economy are taught. Courses and trainings on the topic of green economy are organised.	Disciplines directly related to green economy are taught, interdisciplinary approaches exist, but environmental elements are not introduced in the teaching of all disciplines.	Disciplines directly related to green economy are taught, but environmental elements are not introduced in the teaching of all disciplines. Courses, trainings on the topic of green economy are organised.
Implementation of practical projects on sustainable development and environmental initiatives	Practical sustainable development projects and environmental initiatives are being implemented.	Practical sustainable development projects and environmental initiatives are being implemented.	Practical projects on sustainable development and environmental initiatives are being implemented, as well as environmental-economic and environmental-pedagogical initiatives.
Pedagogical monitoring methods and its quality	Financial and economic methods and monitoring tools: cost and profitability analysis, benchmarking, budgeting, modelling. Changes introduced based on the monitoring results do not always affect the educational process.	Financial and economic methods and monitoring tools: cost and profitability analysis, resource optimisation, benchmarking, budgeting, KPI. Changes introduced based on the pedagogical monitoring results do not always affect the educational process.	Financial and economic methods and tools of monitoring: cost and profitability analysis, benchmarking, budgeting, KPI. Changes introduced based on the pedagogical monitoring results do not always affect the educational process.
Role of educators and students in the implementation of green economy principles	Educators take part in the implementation of the principles of green economy, the management of the educational institution promotes the implementation of these principles, but the motivation of students in this process is low.	Educators and students are actively involved in the implementation of the principles of green economy, the management of the educational institution contributes to the implementation of these principles.	All participants of the educational process implement the green economy principles.

Source: created by the authors

The results of the comparative analysis demonstrated that, although the studied universities actively implement the principles of green economy, practical projects, and environmental initiatives, there are problems in the quality of monitoring. Universities do not use all possible financial and economic methods and tools of pedagogical monitoring, and changes based on its results are not always tangible. Furthermore, the results of the interviews demonstrated that there are some barriers in the monitoring and implementation of green economy in the educational process, namely: lack of material and technical support, inability to use innovative technologies, low motivation of students to implement the green economy principles.

Lack of material and technical support was noted by 45% of the interviewed experts (11 people). They considered that methodological materials and technical means are not always sufficient for proper fulfilment of green economy principles. 35% of the interviewed experts (9 people) noted that one of the barriers is the inability to use innovative technologies, which can be explained by both the inability of educators and students to use them and the lack of technical support. This affects both the quality of monitoring and the effectiveness of the educational process. 32% of the interviewed experts (8 people) noted low motivation of students to implement green economy, as there is no formed environmental responsibility, specifically, there is no formed understanding of the need to save the environment for the next generations. This could indicate the insufficient effectiveness of the ongoing monitoring, as based on the obtained data, strategies to increase students' motivation should have been developed.

The findings demonstrated the need to introduce changes in the pedagogical monitoring process, specifically the need to consider financial and economic aspects, and to update approaches to improve the effectiveness of the green economy in higher education. Based on the stages of pedagogical monitoring, a model for evaluating the educational process through the lens of the green economy was compiled (Fig. 5). This model includes 3 stages: planning, diagnostics, and strategy development. At the planning stage, the goals and objectives of monitoring and its criteria are defined. Thus, the purpose of pedagogical monitoring through the lens of green economy can be to assess the quality of implementation of green economy principles in the teaching of non-economic disciplines, to determine the level of students' readiness to implement green economy principles, to assess the level of environmental responsibility of students. The criteria of pedagogical monitoring in this area can include the degree of greening of curricula, the presence of practical projects and environmental initiatives, the level of students' awareness of environmental challenges and methods of their elimination. At the planning stage, the methods of information collection are also selected, which can include questionnaires, surveys, interviews, observation of the educational process. At this stage, the budgeting tool is also used: the resources required for monitoring are determined, as well as the financial and economic capacity of the educational institution, which will be useful in the next stages.

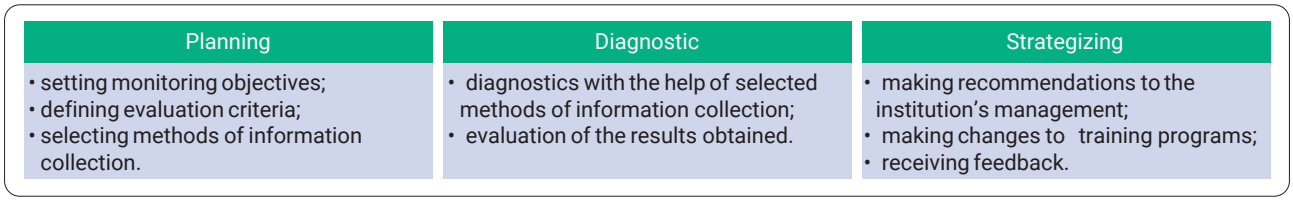

Figure 5. Model of educational process evaluation through the lens of green economy
Source: created by the authors

The next stage is diagnostics. At this stage, diagnostics is performed using the selected methods of information collection (questionnaire, survey, interview, observation). This stage also includes evaluation of the obtained data: analysing the results of the questionnaire/survey/interview/observation, determining whether the results meet the necessary criteria, collecting other elements relevant to the study. It is advisable to evaluate the obtained data using innovative technologies, specifically, using artificial intelligence. Its use at the stage of diagnostics enables a more accurate assessment of the results obtained and a more detailed evaluation of the advantages and disadvantages of existing training programmes. It also minimises errors in the assessment of pedagogical monitoring results and levels out the influence of the "human factor". At this stage, it is advisable to use such financial and economic approaches and tools as KPI and benchmarking. The KPI can be used for quantitative assessment of the obtained results, while benchmarking can be applied to compare the monitoring results in different educational institutions.

Based on the results obtained at the diagnostic stage, during the development of the strategy recommendations are formed for the management of higher education institutions: what needs to be changed for better implementation of green economy principles in the educational process, what methods and approaches should be modernised or completely changed. Changes are introduced in the curricula: new disciplines are added, or existing ones are modernised, trainings, webinars, courses, and other activities necessary to achieve the goals of the educational process are organised. At this stage, such financial and economic approaches to monitoring as optimisation and modelling are used. When developing new educational strategies, all possible variants of their implementation and their consequences are modelled in two scenarios: positive and negative. The existing resources are optimised to minimise financial costs and to conserve natural resources and ecosystems. This stage also provides the opportunity to receive feedback on the implemented changes and to plan the date and goals of the next pedagogical monitoring. While introducing changes in the educational process, it is important to regularly analyse costs and profitability and, if necessary, to adjust the existing strategy. This will affect both the quality of monitoring of the educational process and the effectiveness of training specialists through the lens of the green economy.

Such a model can be implemented by teachers with experience in monitoring, experts in the field of green economy, specially invited monitoring specialists, local government and education authorities, representatives of public organisations (representatives of environmental organisations). If all the above options are unavailable, the described model can be implemented by the management of the educational institution. Based on the obtained information, the approaches that can affect the effectiveness of the implementation of the principles of sustainable development and green economy in the educational process were proposed. The approaches were divided into three groups, each of which is aimed at resolving certain barriers in the educational process. In case of lack of material and technical support: cooperation with other educational institutions (specifically with international ones); partnership with public organisations; implementation of environmental projects and initiatives that do not require material and technical investments.

Cooperation with other educational institutions may include organisation of joint environmental events (excursions, quests, flash mobs), exchange of practices, holding joint open classes, where students will develop environmental responsibility and understanding of the role of green economy in preserving the environment. The same advantages of cooperation with public organisations that can contribute to environmental events, demonstration lessons, and provide any resources for the implementation of environmental initiatives. Implementation of environmental projects and initiatives that do not require material and technical investments may include sorting waste, saving natural resources (electricity, water), organising a 'green corner' in the educational institution or joint landscaping of the territory of the higher education institution with students, educators, and environmental NGOs. In case of inability to use innovative technologies, approaches to improve the efficiency of the educational process can include project-based learning, organisation of trainings and courses, use of social networks.

Project-based learning can include individual or group projects on environmental and economic topics using innovative technologies. For example, students can be given such tasks as: to make a presentation on environmental and economic topics, to make a short video, to propose possibilities of using artificial intelligence and virtual reality to increase environmental responsibility and save the environment. This will help students not only to develop skills in using modern technologies, but also to form environmental responsibility and understanding of the role of green economy principles in the educational process and in the development of society. It is expedient to create trainings and courses, in the framework of which educators and students will develop the ability to use modern technologies for teaching, specifically for environmental and economic purposes. The use of social networks, which are often used by modern youth, can be effective. Information about existing environmental projects and initiatives can be published in social networks, and separate groups can be created to discuss these projects and initiatives, where students and teachers can interact, express their opinions and propose their ideas. In case of low motivation of students to implement the green economy principles, effective approaches can include elements of competition; environmental initiatives "by special interest".

In terms of competitive elements, it is possible to introduce a certain reward for those students/groups of students who sort more waste, take part in more environmental initiatives, etc. Environmental initiatives "by special interest" could include making posters on environmental challenges for those who like creativity; shooting environmental videos for those who like modern technology; "green" marathons for those who like sports; writing articles on environmental topics for the university newspaper or the university website/blog for those who can and want to work with text; conducting research in the environmental field for those who are engaged in science. Such approaches will increase the motivation of students to implement the green economy principles into the educational process and increase their effectiveness.

Thus, green economy and higher education are closely interrelated: as green economy affects the educational process and the quality of training of future specialists, so the educational process can affect the green economy and the possibility of implementing its principles in society. An essential stage in this process is monitoring, which can affect the quality of implementation of green economy principles in the educational process and, consequently, the quality of their implementation in various public sectors. The most effective pedagogical monitoring can be based on financial and economic approaches (cost and profitability analysis, resource optimisation, benchmarking) and tools (budgeting, KPI calculation, modelling). To assess the educational process and quality of monitoring through the lens of green economy, a study was conducted among students, educators, and experts of Kyrgyz State University named after Ishenaly Arabaev, Almaty Humanitarian-Economic University, and Tashkent State Economic University. The study demonstrated that educational institutions are actively implementing green economy principles by introducing environmental, economic, and pedagogical initiatives and by integrating green economy principles into educational programmes. However, the findings of the study also demonstrated such problems as lack of practice of the obtained environmental knowledge, insufficient effectiveness of pedagogical monitoring, low level of application of financial and economic approaches to it, lack of material and technical base and skills of interaction with modern technologies, as well as low motivation of students. To solve these problems, a new model of educational process evaluation through the lens of green economy was proposed, which is based on financial and economic approaches and includes three stages: planning, diagnostics, and strategy development. Approaches to improve the effectiveness of green economy principles in higher education were also proposed, namely: cooperation with other educational institutions (especially international ones), partnership with public organisations, implementation of environmental projects and initiatives that do not require material and technical investments, project-based learning, organisation of trainings and courses, use of social networks, introduction of elements of competition and environmental initiatives "by special interest" into the educational process. Only comprehensive monitoring based on financial and economic approaches and the development of new strategies for the implementation of green economy principles in the educational process can affect the quality of training of future specialists and their ability to implement these principles in their field of activity.

Discussion

In the world today, where the modernisation and globalisation processes are actively taking place, the issue of introducing ecological approaches becomes relevant, as most of

the natural resources and ecosystems are non-renewable. Economic development, which is essential for the state, is impossible without green economy, a concept that promotes sustainable development and preservation of the environment. This made the problem of introducing green economy in all state sectors, particularly in the educational sector, relevant, while testing the quality of implementation of green economy principles in the educational process is significant for shaping environmental responsibility in future generations.

In this study, green economy was considered as an ecological-economic concept, the implementation of the principles of which contributes to sustainable development. T. Jackson & P.A. Victor (2024) investigated green economy as a new trend, considered it as a concept of improving the life of the population. K. Manisha & I. Singh (2024) conducted a bibliometric analysis of green economy, defined it as a concept that allows the competent allocation of natural resources, their preservation, and based on this, improve the quality of life. C. Wang *et al.* (2024) analysed environmental regulation and green innovation within the framework of the green economy, considered it as an economic model that is based on environmental principles and contributes to the economic development of the state. J. Jędrzejczak-Gas *et al.* (2024) studied the green economy from a regional perspective, defined it as an economic sector that affects the improvement of the quality of life by reducing environmental risks. The experts' definitions are consistent with the one used in this study and confirm the relevance of green economy in modern society.

A.C. Tippa & K. Amodekar (2024) investigated the relevance of green economy, revealing the role of green economy and the specific features of implementing its principles. The findings of A.C. Tippa & K. Amodekar confirmed that the transition of the modern world to the green economy principles is vital considering the ongoing changes. Green economy, as part of sustainable development, not only promotes economic growth, but also solves environmental problems, which can ensure sustainable development for future generations. W. Ma (2022) also revealed the necessity of green economy, investigating the relationship between green economy and higher education. The researcher concluded that green economy in the modern world is one of the methods to develop all state industries and a method of preserving the environment, which correlates with the findings of the present study. Furthermore, the researcher noted that higher education directly affects the development of green economy and, conversely, green economy affects all educational processes. This demonstrated the relevance of the present study and the impact of implementing green economy principles in the educational process on the development of all government sectors.

W. Gao *et al*. (2019) covered the impact of higher education on the development of green economy. The researchers concluded that higher education influences the economic development of the state and its other industries. The experts also noted that through higher education, it is possible to train such professionals that will foster technological and environmental innovation, which was also identified in this study. Z. Kilasonia (2023), and A.B.A. Avelar & M.L. Pajuelo-Moreno (2024) reached the same conclusions, revealing the role of higher education institutions in promoting sustainable development goals. Researchers believe that the purpose of the educational process is to prepare such professionals who will become catalysts of environmental-economic change in the future. Furthermore, the green economy is a part of sustainable development, the goals of which are also fulfilled in the educational process.

This study considered sustainable development as a concept that ensures the interconnection of natural resources, economy, and other social processes to meet the needs of society, is instrumental in the development of the state, as well as in higher education. Green economy was considered as an element of sustainable development. T. Trinh & V. Huong (2024), as well as J. Jędrzejczak Gas *et al.* (2024) covered the interrelation of sustainable development and green economy. The researchers concluded that green economy is focused on sustainable development, particularly economic development, and includes environmental protection, implementation of green technologies and projects, which determines their interrelationship and correlates with the findings of the present study. Furthermore, sustainable development, like green economy, plays a vital role in higher education.

R.H. Sebire & S. Isabeles-Flores (2023) emphasised the necessity of introducing the sustainable development principles in the educational process of higher education institutions, which will contribute to the preparation of future professionals to promote these principles in their respective fields of work, which correlates with the findings of the present study. K.M. Mahesh *et al*. (2024) noted the significance of an interdisciplinary approach: introducing the principles of sustainable development into the teaching of unrelated disciplines. Such an approach was also discussed in the present study, which confirms the need to integrate the principles of sustainable development, specifically the principles of green economy, into the curricula. M.S. Bharti (2024), revealing aspects of the European Union's green economy policy, concluded that apart from educational objectives, sustainable development ensures the resolution of such problems as the availability of natural resources and their purity, decent working conditions, economic growth, reduction of inequality, responsible consumption, equitable access to resources, climate change, etc. This corresponds to the concepts of "eco-inclusiveness" and "eco-adaptability" introduced in this study and demonstrates that sustainable development, particularly the green economy, is not only directed at economic growth and environmental sustainability, but also at solving a series of other societal problems.

Exploring the experience of sustainable development in higher education in Albania, A. Kunčič & A. Işık (2024) found that only a small percentage of educational stakeholders (37%) are involved in "sustainable" initiatives and projects. The present study showed more positive results: in

the higher education institutions studied in this research, both educators and students take an active part in various environmental projects and initiatives, which demonstrates the readiness of Kyrgyzstan, Kazakhstan, and Uzbekistan to implement the principles of green economy in the educational process.

In terms of the countries studied in this research, Sh.Zh. Rakhmetullina (2016) investigated the specific features of the implementation of green economy principles in Kazakhstan. The researcher concluded that the green economy will positively affect the development of all sectors and will lead to a more careful use of natural resources, environmental improvement, changes in infrastructure, improving the well-being of the population, and enhancing national security. This requires training of future specialists and introduction of new educational programmes, development of students' environmental responsibility, dissemination of environmental culture, which correlates with the findings of this study. G.N. Berdiev (2024) studied the aspects of green economy in Uzbekistan. The researcher noted that the modernisation and globalisation processes require innovative approaches to the economy, specifically the development of a green economy, and success in this process depends on the environmental responsibility of citizens and the quality of implementation of innovative "green" developments. This requires quality training of students. The present study also highlighted the crucial role of higher education and environmental responsibility in the implementation of green economy principles in the analysed countries. This may indicate that Kyrgyzstan, Kazakhstan, and Uzbekistan have effective strategies for implementing green economy principles, and their activities in this area are promising. The effectiveness of the introduction of green economy principles in the educational process can be assessed through monitoring. However, this study found that approaches to pedagogical monitoring are not always effective and do not always provide an adequate assessment of the quality of the educational process. This study proposed a model of pedagogical monitoring based on financial and economic approaches, which includes planning, diagnostics, and strategy development.

A. Chen (2024) investigated the financial and economic approaches to education, revealing the effect of economic development on the educational environment. The researcher concluded that education and financial and economic factors are closely interrelated: as financial investments in the educational process affect its quality, so the training of specialists in universities affects the further economic well-being of the state. This demonstrates the effectiveness of using financial and economic approaches in the monitoring and improvement of the quality of the educational process. The present study proposed approaches to improve the effectiveness of green economy in higher education, namely: cooperation with other educational institutions (specifically, with international ones), partnership with public organisations, implementation of environmental projects and initiatives that do not require material and technical investments, project-based learning, organisation of trainings and courses, use of social networks, introduction of elements of competition, and environmental initiatives "by special interest" in the educational process.

A.K. Abdallah *et al.* (2024) covered project-based learning as a method of increasing the effectiveness of green economy principles in the educational process. N. Nikoloudakis & M. Rangoussi (2024) investigated the implementation of green economy principles in vocational education. A.K. Abdallah *et al.* concluded that there may be a possible lack of logistics for the implementation of green economy principles, which was also revealed in the present study. This calls for finding approaches that will not require additional provision, specifically project-based learning can be such an approach. This approach can be used to build practical skills in students as it involves the use of real-life examples and working with them. N. Nikoloudakis & M. Rangoussi also concluded that project-based learning develops students' environmental responsibility and ability to apply the principles of sustainable development and green economy. Building practical skills is important for students as the results of the present study showed a lack of practical skills. This makes project-based learning an effective approach to the educational process.

F.A.N. Zulfa *et al.* (2024), who investigated the impact of technological advancement on the economy, covered the use of modern technology. The researchers noted that green economy is connected with innovation, as its implementation requires the use of new, modern approaches. Thus, the introduction of innovations in the educational process, where the green economy principles are implemented, can contribute to the development of this concept and the formation of students' ability to interact with it. C. Maheshkar *et al.* (2024), who investigated the digitalisation of higher education to achieve sustainable development goals, concluded that the integration of information and communication technologies in the educational process can contribute to sustainable development and the promotion of green economy principles, which correlates with the findings of the present study. Innovative technologies provide a wide range of opportunities for the implementation of green economy, introduction of sustainable development principles, opportunities for the formation of students' necessary knowledge and skills (Shahini, 2024). Furthermore, innovative technologies can be used in monitoring the educational process, which can increase its efficiency and effectiveness of financial and economic approaches to it.

The digitalisation of the educational process has been generally underexplored in this study. Thus, X. Meng & C. Wu (2024), discussing the transition to a green economy through digitalisation, concluded that the introduction of information and communication technologies in all sectors contributes to the transition to a green economy. Innovative technologies provide opportunities to develop fresh approaches to the development of green economy, particularly in the educational environment. X. Shi (2024) reached

an analogous conclusion, investigating the integration of digital economy and green economy. The researcher noted that digitalisation of government industries can contribute to economic growth and sustainable development, which can also be applied to the education industry. According to X. Shi, economic development and environmental protection should not contradict each other but should be interrelated, which is the leading idea of the present study.

The implementation of the green economy principles is a priority in modern society, where there is a need to save the environment and natural resources. It is within the framework of higher education that it is possible to train such specialists who will be able to rise to the environmental and economic challenges. This requires greening of curricula and quality monitoring to assess the effectiveness of the educational process. To improve the effectiveness of pedagogical monitoring, it is necessary to use financial and economic approaches and innovative methods. The analysis of scientific sources confirmed that the methods of improving the quality of the educational process proposed in this study are effective and can develop students' practical skills. The analysis of other studies also confirmed that Kyrgyzstan, Kazakhstan, and Uzbekistan adhere to effective strategies for implementing green economy and strive to maintain a balance between sustainable development, ecology, and economic sector.

Conclusions

The present study uncovered financial and economic approaches to pedagogical monitoring and their effect on improving the quality of the educational process. Green economy is an ecological-pedagogical concept, which is based on the principles of rational use of natural resources, saving ecosystems, as well as on the principles of 'eco-inclusiveness' and 'eco-adaptability'. As the principles of green economy affect the educational process, so it affects the effectiveness of the implementation of 'green' principles, which determines their interrelation. In synergy, they form part of sustainable development, which aims at economic and social changes contributing to the development of society. To effectively introduce and implement the green economy principles in the educational process, it is necessary to conduct regular monitoring, which can contribute to positive changes in curricula. However, established approaches to monitoring may not be relevant, which may provide incorrect information about the quality of the educational process. This requires the introduction of innovative technologies (artificial intelligence) and financial and economic approaches such as cost and profitability analysis, resource optimisation, benchmarking, budgeting, KPI calculation, and modelling into pedagogical monitoring.

The study was conducted among students and educators of Kyrgyz State University named after Ishenaly Arabaev, Almaty Humanitarian-Economic University, and Tashkent State Economic University. Additionally, interviews with experts in the field of green economy were conducted. The findings of the study showed that all the universities under study implement the principles of green economy, while the participants of the educational process and the management of higher education institutions contribute to this endeavour. For example, the Kyrgyz State University named after Ishenaly Arabaev implements environmental projects and projects aimed at sustainable development. In Almaty Humanitarian-Economic University, the focus is on the greening of educational programmes. Tashkent State Economic University implements environmental, economic, and pedagogical initiatives. However, in the educational and monitoring process, there may be such challenges as the lack of material and technical support, limited opportunities to use innovative technologies and approaches, as well as low motivation of students to follow environmental principles.

To resolve these challenges, a model of pedagogical monitoring was proposed, which is based on financial and economic approaches and includes the stages of planning, diagnostics, and strategy development. The study also proposed methods to improve the effectiveness of the educational process through the lens of green economy, specifically, cooperation with educational institutions and public organisations, project-based learning, organisation of trainings and courses, and use of innovative technologies. Together, these methods can improve the quality of the educational process of preparing future specialists for environmental and economic challenges they may face.

Limitations of this study include the random sampling of the surveyed educators and students, as well as the study of several higher education institutions in different countries, which may have affected the accuracy of the findings. The findings of this study could be improved by conducting a questionnaire survey with a non-random sample. The prospects for further research may include experimental testing of the proposed monitoring model and evaluation of the effectiveness of financial and economic approaches.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Abdallah, A.K., Ismail, L.S., & Alkaabi, A.M. (2024). Green careers: Educating for the future of sustainability. In E. Alqodsi & A. Abdallah (Eds.), *Legal frameworks and educational strategies for sustainable development* (pp. 337-366). Hershey: IGI Global. doi: 10.4018/979-8-3693-2987-0.ch017.

[2] Ahmad, U.S., Rahman, Z.U., & Azam, M. (2024). Sustainability and green finance and its relevance to debt for nature swap financing. In A. Hunjra & J. Goodell (Eds.), *The palgrave handbook of green finance for sustainable development* (pp. 645-671). Cham: Palgrave Macmillan. doi: 10.1007/978-3-031-65756-6_24.

[3] Avelar, A.B.A., & Pajuelo-Moreno, M.L. (2024). Role of higher education institutions in promoting sustainable development goals through research, teaching and outreach. In W. Leal Filho, A. Salvia & C. Portela de Vasconcelos (Eds.), *An Agenda for sustainable development research. World sustainability series* (pp. 557-578). Cham: Springer. doi: 10.1007/978-3-031-65909-6_31.
[4] Berdiev, G.N. (2024). Building sustainable development under a green economy in Uzbekistan. *Science and Education*, 5(5), 559-562.
[5] Bharti, M.S. (2024). The EU's green economy policy and its sustainable development goals: Prospects and challenges. In J. Martínez-Falcó, E. Sánchez-García, B. Marco-Lajara & R. Fuentes-Fernández (Eds.), *Global economic interconnectedness: International trade and finance* (pp. 269-294). Hershey: IGI Global. doi: 10.4018/979-8-3693-5303-5.ch013.
[6] Chen, A. (2024). The influence of economic development on educational equity. *Lecture Notes in Education Psychology and Public Media*, 52, 225-229. doi: 10.54254/2753-7048/52/20241577.
[7] Concept of the green economy in the Kyrgyz Republic "Kyrgyzstan – a country of green economy". (2018). Retrieved from https://cbd.minjust.gov.kg/83126/edition/891192/kg.
[8] Dibra, S., Çali, M., & Kina, K. (2023). Role of universities in preparing consumers and professionals for the green economy. *The Albanian Journal of Economy & Business*, 38, 103-120.
[9] Dolhikh, Ya. (2024). Evaluation of the efficiency of agricultural higher education institutions of Ukraine and the dynamics of its change by data envelopment analysis. *Ekonomika APK*, 31(1), 29-40. doi: 10.32317/2221-1055.202401029.
[10] European Commission on ethics and data protection. (2021). Retrieved from https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ethics-and-data-protection_he_en.pdf.
[11] Gao, W., Ding, X., Chen, R., & Min, W. (2019). An empirical study of the role of higher education in building a green economy. *Sustainability,* 11(23), article number 6823. doi: 10.3390/su11236823.
[12] Jackson, T., & Victor, P.A. (2024). *Towards a new, green economy*. Retrieved from https://thenextsystem.org/sites/default/files/2017-08/JacksonVictor.pdf.
[13] Jędrzejczak-Gas, J., Barska, A., Wyrwa, J., & Nowak, L. (2024). Green economy from a regional perspective – a Polish case study. *European Journal of Sustainable Development*, 13(3), 261-274. doi: 10.14207/ejsd.2024.v13n3p261.
[14] Kaldybaev, B.K., Kadyrova, G.B., & Vereshchagin, A.P. (2022). Regional aspects of green economy development in Kyrgyzstan. *Bulletin of Issyk-Kul University,* 51, 1-7.
[15] Kilasonia, Z. (2023). Higher education and the sustainable development goals. *Scientific Journal "Spectri"*, 1. doi: 10.52340/spectri.2023.15.
[16] Kunčič, A., & Işık, A. (2024). *Views on sustainable development goals in higher education in Albania*. doi: 10.13140/RG.2.2.36383.37283.
[17] Kyfyak, V., Kindzerskyi, V., Todoriuk, S., Klevchik, L., & Luste, O. (2024). The role of economics and management in the development of sustainable business models of agricultural enterprises. *Scientific Horizons*, 27(6), 152-162. doi: 10.48077/scihor6.2024.152.
[18] Ma, W. (2022). Research on the coupling and coordination of green finance, higher education, and green economic growth. *Environmental Science and Pollution Research*, 29, 59145-59158. doi: 10.1007/s11356-022-20026-2.
[19] Mahesh, K.M., Aithal, P.S., & Sharma, K.R.S. (2024). Green HRM and teaching sustainability in higher education institutions: For promoting sustainable education and sustainable development goals. *International Journal of Case Studies in Business IT and Education,* 8(1), 260-270. doi: 10.5281/zenodo.10810306.
[20] Maheshkar, C., Kapse, M., Bhattacharjee, S., Poulose, J., & Sharma, V. (2024). Digitalization (ICTs) of higher education for achieving sustainable development goal for education (SDG4). In S. Bhattacharya, V. Venkatesh & S. Chatterjee (Eds.), *Responsible corporate leadership towards attainment of sustainable development goals* (pp. 107-122). Singapore: Springer. doi: 10.1007/978-981-97-1386-8_6.
[21] Manisha, K., & Singh, I. (2024). Investigating green economy studies using a bibliometric analysis. *Journal of the Knowledge Economy*. doi: 10.1007/s13132-024-02237-9.
[22] Meng, X., & Wu, C. (2024). Empirical evidence on digitization enabling the transition to a green economy in China. *Environmental Science and Pollution Research*, 31, 51790-51805. doi: 10.1007/s11356-024-34613-y.
[23] Mikhailov, A., Kurpayanidi, K., & Turgunov, N. (2023). Green economy: Problems, prospects and opportunities for Uzbekistan. *Nashrlar*, 1(2), 434-437.
[24] Mohamed, Y.S., Spaska, A., Andrade, G., Baraka, M.A., Ahmad, H., Steele, S., Abu-rish, E.Y., Nasor, E.M., Forsat, K., Teir, H.J., Bani, I., & Panigrahi, D. (2024). Hand hygiene knowledge, attitude, and practice before, during and post COVID-19: A cross-sectional study among university students in the United Arab Emirates. *Infection Prevention in Practice*, 6(2), article number 100361. doi: 10.1016/j.infpip.2024.100361.

[25] Nikoloudakis, N., & Rangoussi, M. (2024). Introducing green, eco-friendly practices and circular economy principles in vocational education through a novel analysis-synthesis method: Design, implementation and evaluation. *International Journal for Research in Vocational Education and Training*, 11(3), 429-459. doi: 10.13152/IJRVET.11.3.5.
[26] Odiyo, J.O., Musyoki, A., & Makungo, R. (2022). Skills and knowledge transfer for transitioning into the green economy. In J. Odiyo, P. Bikam & J. Chakwizira, J (Eds.), *Green economy in the transport sector* (pp. 65-77). Cham: Springer. doi: 10.1007/978-3-030-86178-0_6.
[27] On the Concept of the Transition of the Republic of Kazakhstan to a "Green Economy". (2013). Retrieved from https://adilet.zan.kz/kaz/docs/T1300000577.
[28] Onyshchenko, N., & Serdiuk, N. (2023). Practical training of future teachers for innovative activities: International experience. *Scientia et Societus*, 2(2), 73-83. doi: 10.69587/ss/2.2023.73.
[29] Ponomarenko, V., & Pysarchuk, O. (2024). Peculiarities of the impact of learning losses on the formation of human capital in Ukraine under martial law. *Economics of Development*, 23(1), 38-52. doi: 10.57111/econ/1.2024.38.
[30] Rakhmetullina, Sh. Zh. (2016). "Green economy" as element of steady development. *KRSU Bulletin*, 16(2), 71-74.
[31] Resolution of the President of the Republic of Uzbekistan "On Measures to Improve the Effectiveness of Reforms Aimed at the Transition of the Republic of Uzbekistan to a "Green" Economy by 2030". (2022, December). Retrieved from https://lex.uz/en/docs/6303230.
[32] Sebire, R.H., & Isabeles-Flores, S. (2023). Sustainable development in higher education practices. *Journal of Language and Culture*, 5(9), 89-96. doi: 10.29057/lc.v5i9.10971.
[33] Shahini, E. (2024). Economic evolution of Durres University: A historical perspective from 1803 to 2030. *Salud, Ciencia y Tecnologia – Serie de Conferencias*, 3, article number 1011. doi: 10.56294/sctconf20241011.
[34] Shakulikova, G.T., & Akhmetov, S.M. (2021). The role of the "green economy" in the sustainable development of ecological and economic systems of Kazakhstan. *Oil and Gas,* 6(126), 13-37. doi: 10.37878/2708-0080/2021-6.01.
[35] Shi, X. (2024). Research on high-quality integration of the economy of digit and green economy. *Frontiers in Business, Economics and Management*, 16(2), 18-21. doi: 10.54097/2evazt37.
[36] Sushil, K., Prabakar, S., Giri, P., Satapathy, D., Sharma, G., Singh, P., & Shrivastava, A. (2024). Intelligent advanced model implementation of green financing concept in the financial monitoring system for enterprises activity based on sustainable development. *International Journal of Intelligent Systems and Applications in Engineering*, 12(21s), 617-629.
[37] Tippa, A.C., & Amodekar, K. (2024). Working towards a green economy – meaning, measures, policies & implementation. *International Journal of Scientific Research and Management*, 12(8), 7071-7182. doi: 10.18535/ijsrm/v12i08.em18.
[38] Trinh, T., & Huong, V. (2024). Developing a green economy towards sustainability: Research in Vietnam in the context of digital transformation. *International Journal of Advanced Economics*, 6(10), 503-516. doi: 10.51594/ijae.v6i10.1609
[39] Wang, C., Du, D., Liu, T., Li, X., Zhu, Y., Du, W., Xu, F., Yan, M., & Chen, J. (2024). Environmental regulations, green technological innovation, and green economy: Evidence from China. *Sustainability*, 16(13), article number 5630. doi: 10.3390/su16135630.
[40] Yevseiev, S., Rayevnyeva, O., Ponomarenko, V., & Milov, O. (2020). Development of methodological principles for the construction of a corporate information educational system of innovative-active university in the framework of anti-corruption activities. *Eastern-European Journal of Enterprise Technologies*, 5(2-107), 6-28. doi: 10.15587/1729-4061.2020.214895.
[41] Zhang, X., Zhou, G., He, W., & Zheng, Y. (2024). The economic implications of education: A global perspective. *SHS Web of Conferences*, 190, article number 03005. doi: 10.1051/shsconf/202419003005.
[42] Zulfa, F.A.N., Putri, B.A., & Permatasari, D. (2024). Stimulating national economic growth through synergy of digital innovation and green economy. *Formosa Journal of Sustainable Research*, 3(9), 1945-1958. doi: 10.55927/fjsr.v3i9.11242.

Фінансово-економічні підходи до педагогічного моніторингу у вищій освіті: забезпечення якості через принципи зеленої економіки

Джилдиз Албанбаєва
Старший викладач
Киргизький державний університет імені І. Арабаєва
720026, вул. Раззакова, 51А, м. Бішкек, Киргизька Республіка
https://orcid.org/0000-0003-3558-7107

Жибек Амеркулова
Старший викладач
Киргизький державний університет імені І. Арабаєва
720026, вул. Раззакова, 51А, м. Бішкек, Киргизька Республіка
https://orcid.org/0009-0006-5416-167x

Асилькан Шаршеєва
Старший викладач
Киргизький державний університет імені І. Арабаєва
720026, вул. Раззакова, 51А, м. Бішкек, Киргизька Республіка
https://orcid.org/0000-0008-6536-045x

Айгуль Чалданбаєва
Доктор педагогічних наук, професор
Киргизький державний університет імені І. Арабаєва
720026, вул. Раззакова, 51А, м. Бішкек, Киргизька Республіка
https://orcid.org/0009-0003-8107-2697

Рустамбек Асанов
Кандидат економічних наук
Киргизький державний університет імені І. Арабаєва
720026, вул. Раззакова, 51А, м. Бішкек, Киргизька Республіка
https://orcid.org/0009-0005-0166-9229

Анотація. Метою цього дослідження було розкрити фінансово-економічні підходи до моніторингу для інтеграції зеленої економіки в освітній процес. Проведено аналіз фінансово-економічних аспектів педагогічного моніторингу та їхню роль у впровадженні зеленої економіки у вищу освіту. Розкрито взаємозв'язок між сталим розвитком і зеленою економікою, проаналізовано вплив зеленої економіки на освітній процес. Визначено фінансово-економічні методи моніторингу: аналіз витрат і рентабельності, оптимізація ресурсів, бенчмаркінг, бюджетування, розрахунок ключових показників ефективності, моделювання. Розкрито ступінь впровадження принципів зеленої економіки в освітній процес Киргизстану, Казахстану та Узбекистану. Для оцінки реальних практик у вищих навчальних закладах, проаналізовано думку педагогів і студентів Киргизького державного університету імені Ішенали Арабаєва, Алматинського гуманітарно-економічного університету, Ташкентського державного економічного університету. Результати засвідчили, що в досліджуваних університетах активно реалізуються екологічні проєкти та ініціативи, пов'язані зі сталим розвитком і зеленою економікою. Крім того, принципи зеленої економіки інтегрувалися в навчальні програми. Однак, результативність моніторингу освітнього процесу низька. Виявлено й фінансово-економічні бар'єри в процесі моніторингу та впровадження зеленої економіки в освітній процес, зокрема: брак матеріально-технічного забезпечення (45 %), обмежені можливості використання інноваційних технологій (35 %), низька мотивація студентів до реалізації принципів зеленої економіки (32 %). Існують бар'єри і в практичній підготовці майбутніх фахівців до реалізації принципів зеленої економіки. Для ефективнішої практичної підготовки студентів та для підвищення ефективності зеленої економіки, запропоновано впровадити в освітній процес співпрацю з навчальними закладами та громадськими організаціями, проєктне навчання, організувати тренінги та курси, а також використовувати інформаційно-комунікаційні технології. Було запропоновано модель моніторингу на основі фінансово-економічних підходів, яка містить у собі етапи планування, діагностики та етап розроблення стратегії, що може вплинути на об'єктивність оцінювання освітнього процесу через призму зеленої економіки

Ключові слова: сталий розвиток; екологічні ініціативи; програма навчання; інноваційні методи; підготовка фахівців

Scientific Bulletin
of Mukachevo State University

Series
Economics

Volume 11, No. 4, 27-39
Journal homepage: https://economics-msu.com.ua/en

UDC 338.12:366.12
DOI: 10.52566/msu-econ4.2024.27

Optimising the management succession process in a family business

Konrad Brodaczewski*
Master of Economics, Master of Law, Vice Director
Grena Limited
1000, Great West Road, Middlesex TW8 9HH, London, United Kingdom
https://orcid.org/0009-0004-7330-6585

Abstract. The purpose of the study was to identify the succession management processes in family businesses, with a particular focus on the development and implementation of optimization approaches that contribute to the long-term stability and competitiveness of the enterprise. The research focused on identifying key challenges that arise during the intergenerational transfer of management functions, including an analysis of internal and external factors that influence this process. A major part of the work was studying the role of family values and corporate culture, which are fundamental elements of the succession strategy. Particular attention was paid to how these elements can be preserved and passed on to successors, which is critical to preserving the enterprise's identity. The research methodology was based on a comprehensive analysis of the management succession process in a family business, including several key stages. The first stage involved an assessment of corporate culture, management practices, and financial aspects to ensure business stability during the transfer of management functions. The second stage involved a financial analysis of instruments to support the stability of the enterprise and the development of recommendations for financial risk management. The next step was a comparative analysis of real-life cases to identify successful succession practices, which allowed to creation of a comprehensive picture of the succession management process. Based on the study, key approaches were identified, and practical recommendations were developed that can significantly contribute to the successful transfer of management in family businesses. In particular, the importance of strategic succession planning, which includes the early involvement of successors in the management process, the creation of detailed plans for their development, and the implementation of support systems for new leaders, was emphasized. The recommendations are designed to ensure a smooth and efficient transition of management functions, allowing family businesses to maintain stability and prosperity in the face of generational change

Keywords: transfer of ownership; corporate culture; effective transition; role of external consultants; strategic succession planning

Received: 12.08.2024, Revised: 29.11.2024, Accepted: 27.12.2024

Suggested Citation: Brodaczewski, K. (2024). Optimising the management succession process in a family business. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 27-39. doi: 10.52566/msu-econ4.2024.27.

*Corresponding author

Introduction

Optimising the process of management succession in family businesses is an important topic that is gaining particular relevance in the context of economic development in Poland. In this country, family businesses play a key role in the economy, contributing a significant portion of the gross domestic product (GDP) and creating jobs for millions of citizens. According to research, there are more than 830,000 family businesses in Poland, accounting for about 60% of the total number of businesses in the country. About 40% of these companies are small and medium-sized enterprises, which makes them the basis of economic stability and growth (Nakielski, 2021). However, the issue of management succession remains one of the biggest challenges for such enterprises. Optimising this process is critical for the preservation and development of family businesses, especially given their importance in the national economy. Effective succession strategies, such as formalizing the management handover process, engaging external experts, and training successors, can significantly increase the chances of a successful transition to the next generation. Studies show that businesses with a clearly defined succession plan are 25% more likely to have a successful management transition than those without such a plan. In addition, it is relevant to take into account that the development of technology and changes in the market environment require successors to have not only business knowledge but also new competencies, such as digital literacy and innovation management. Thus, optimising the management succession process is a prerequisite for ensuring the long-term sustainability of family businesses in Poland, which in turn will contribute to the stability and growth of the country's economy as a whole.

In today's family business environment, more and more attention is being paid to the effective transfer of management from one generation to the next. The process of succession is an essential stage in the life cycle of family businesses, as it affects both the preservation and further development of the business. The research on this issue covers both theoretical aspects related to the identification of key factors for a successful transfer of power and practical recommendations for optimising this process. At the same time, the succession process requires a deep understanding of the specifics of a family business, where not only economic but also social and emotional factors play a pivotal role. Intergenerational conflicts, differences in management approaches, and family values can both contribute to a successful succession and become serious obstacles. Optimising the succession process is therefore a complex task that requires a balanced approach.

From a theoretical perspective, it is crucial to develop clear models and strategies that take into account both the internal characteristics of the family business and external factors such as market conditions, changes in the legal environment, and the economic situation. Optimising succession also involves engaging consultants who can help with complex management issues and mitigate the risks associated with the transition of the business to the next generation (Quliyev *et al.*, 2024). Research in this area provides an opportunity not only to understand the main problems faced by family businesses during the transfer of management but also to find effective ways to solve them. This can help ensure the stability and long-term success of a family business, which is the main objective of optimizing the management succession process.

The study of optimising the process of management succession in family business has become the subject of considerable attention among foreign scholars seeking to find effective approaches to the transfer of management from one generation to another. K. Nakielski (2021) developed the concept of a three-dimensional model of family business, taking into account the interaction of family, business, and management systems. This work became the basis for further research that considers succession as a multidimensional process. Another contribution to the study of this issue was made by L.A. Dau *et al.* (2022), who focused on the social and emotional aspects of succession, namely how interpersonal relationships and conflicts between family members can affect the process of transferring management, emphasising the importance of taking into account family values and traditions when planning succession, which is a key factor in the successful transition of a business to the next generation. Other prominent scholars include A. Jaki & S. Kruk (2019), who analysed the economic and managerial aspects of succession, the problems that arise during the change of management, and proposed theoretical models that help reduce the risks associated with the transfer of management. A. Jaki and S. Kruk studied the development of strategies that can improve the effectiveness of the succession process by engaging external consultants and creating clear succession plans. S. Priatmoko *et al.* (2023) studied the impact of cultural and national characteristics on the succession process in family businesses. He drew attention to the fact that successful succession depends not only on internal business factors but also on the external environment, including legal regulation and cultural norms.

One of the researchers in this area is J.R. Baltazar *et al.* (2022), who studied the role of cultural and family values in the process of management transfer and the importance of preserving family traditions and paying special attention to interpersonal relations between family members, which is a key factor in successful succession in the Ukrainian context. Another well-known researcher, L. Zapata-Cantu *et al.* (2022), focused on the legal aspects of the succession process. The research covered the issues of legal regulation and the need to develop clear legal mechanisms to ensure a smooth management transition and to create institutional support that would help family businesses effectively plan and implement the transfer of management functions. I.Y. Yegorov *et al.* (2020) studied the economic aspects of management succession and the impact of financial planning and capital preservation strategies on its

success. The researcher identified financial management models that allow for maintaining business sustainability during a change of management, which is especially important for family businesses, where succession is often accompanied by significant financial challenges. A significant contribution to the study of this topic was also made by N. Balatska *et al.* (2022), who studied the influence of socio-psychological factors on the succession process and focused on the psychological preparation of future heirs for managerial roles and the need for early integration of the younger generation into management processes, which contributes to a smoother and more efficient transition of power.

The purpose of this article was to study the process of management succession in family businesses and develop recommendations for its optimization. Particular attention was paid to identifying the key obstacles and risks faced by family businesses during the change of management, as well as finding effective strategies to overcome them. Objectives:

1. Assessing the main factors of the process of management succession in a family business, including the transfer of management functions.

2. Analysing methods of optimising the process of transferring management in a family business.

3. Exploring successful cases of management transfer in family businesses.

Materials and Methods

The study focused on a comprehensive analysis of the management succession process in family businesses. The management succession process in family businesses is a complex process that involves several key stages to ensure an effective and smooth transition of management functions from one generation to the next. The study's methodological approach considers various aspects and employs several crucial stages and methods, which collectively paint a comprehensive picture of the succession process. In the first stage of the study, the key aspects related to management continuity were assessed. The study included an examination of the impact of corporate culture on management practices and relationships in family businesses. It was determined how family values shape management styles and intergenerational interactions. The assessment of financial aspects included consideration of tools to ensure business stability during the transition of management functions, such as cash flow planning and risk insurance. In this context, management practices were considered, including defining the roles and responsibilities of family members, establishing effective communication channels, and introducing a system of support and mentoring for the new generation.

The second stage included financial analysis, including an assessment of the necessary financial instruments to maintain the company's stability during the transition of management functions. The study of financial risk management methods, such as insurance and cash flow planning, allowed us to create recommendations for maintaining financial stability. Various approaches to developing succession strategies were studied, including clear planning for the transfer of management functions, involving the next generation in decision-making processes, and ensuring transparency in financial matters. In the next stage, a comparative analysis of cases from real enterprises was carried out, in particular Żywiec Zdrój (2021), FAMUR S.A. (2024), and LPP S.A. (2024). The analysis of the succession strategies of these companies allowed us to identify successful practices and models of succession management. Żywiec Zdrój, as a leading mineral water producer in Poland, has demonstrated effective management processes through the involvement of family values. FAMUR S.A. (2024) due to its high technological sophistication, used external consultants to develop strategies that maintain competitiveness. LPP S.A. (2024) showed how the active involvement of the new generation can ensure a successful business transfer and reduce conflicts. The study used case analysis and comparison of management strategies in three case studies to identify the key elements of successful succession.

This study analysed data obtained from several reputable sources, which provide a deep understanding of the economic situation and corporate governance in Poland. In particular, information from the CASE (2024), the Polish Association of Small and Medium Enterprises (2024), the Tax- Residence (2024), the Polish Institute of Corporate Management (PICM) (2024), and the Family Businesses in Poland (2017) was analysed. Social aspects were also studied, including the impact of transparency and openness in the succession process on the level of trust among employees and partners. The analysis of communication strategies allowed us to assess how they affected the social atmosphere within the company and relationships with partners and customers.

Results

Managing a family business is a complex and multifaceted process that involves not only economic aspects but also psychological, social, and cultural factors. Ensuring continuity of management, which often involves the transfer of power from one generation to the next, is a key challenge faced by such businesses. This process requires careful planning and preparation to avoid potential conflicts and ensure the business's sustainable development in the future. An essential aspect in this context is the timely identification of potential successors who possess the necessary competencies and motivation to effectively manage the company, which includes not only an assessment of their professional skills but also consideration of personal qualities such as leadership skills, the ability to make decisions in conditions of uncertainty and the willingness to take responsibility for the fate of the business. It is equally relevant to ensure the continuity of the company's values and culture, which is often the foundation for the successful operation of a family business. The lack of clear transmission of these aspects can lead to a gap between generations, which will negatively affect the stability and development of the company. To this end, it is important to introduce mentoring systems where the older generation passes on their

knowledge and experience to younger family members, helping them to better understand the specifics of management and decision-making in the context of this particular business. The succession process should also be transparent and understandable to all business stakeholders, including not only family members but also key employees. Openness and honesty in communication can reduce the risk of internal conflicts and help build trust among all stakeholders. It is also critical to create clearly defined mechanisms for resolving conflicts that may arise during the transition to minimize the negative impact on the company's operations.

Optimising the succession process in the management of family businesses is critical to ensuring the stability and long-term success of such enterprises in Poland. The national context underlines the importance of this issue, as family businesses represent a significant share of the country's economy, and their effective management is crucial for economic development. For example, Nowy Styl, founded in 1992, is one of the leading furniture manufacturers in Europe that has successfully passed management from the founders to the next generation. They have developed and implemented a strategic succession plan, including the involvement of external consultants and experts to support the process of transferring management functions as well as creating a system for training new leaders. Another example is the company Blikle, known for its confectionery products, which have been in existence for over 150 years. Throughout its history, this company has gone through several intergenerational management transitions, successfully adapting to new market conditions and preserving its traditions. Family values and corporate culture have always remained at the centre of attention, which has helped maintain the stability of the business for many decades. Gerlach (2024), which specialises in the production of kitchenware and cutlery, is also an example of a successful family business where the succession process has been optimised to ensure long-term success. The transfer of management in this company was accompanied by the introduction of modern management methods and the involvement of external specialists, which allowed it to remain competitive in the international market.

Family businesses occupy a significant part of the Polish economy, as they make up the bulk of small and medium-sized enterprises. Transferring a business from one generation to the next is a complex task that requires consideration of several aspects, including the transfer strategy, preparation for the next generation, management practices, and legal issues. The process of successful business succession begins with the development of a clear strategy, which should not only include economic aspects but also take into account family relationships and corporate culture. It is important to identify which of the next generations is best suited to manage the business and develop an action plan to prepare them for their new roles, which may include educational programs, training, and practical experience to enable the next generation to acquire the necessary skills to manage effectively.

Successful succession also requires managing possible family conflicts. Misunderstandings and disputes can affect the succession process and even lead to the division or closure of the business. To mitigate risks, it is essential to hold regular consultations and discussions among family members and to engage mediators or management consultants if necessary. It is equally crucial to formalize the succession process through legal mechanisms, such as wills, business transfer agreements, and other legal documents. Proper legal arrangements help avoid legal disputes and ensure a smooth transition of management functions. It is also worth considering the tax implications of a business transfer and taking steps to minimise them. To optimise the succession process, it is also important to take into account the specifics of the Polish market and legal system. Succession requires not only a technical and managerial approach but also a cultural consideration of the traditions and values that influence the way business is conducted. Successfully optimising the succession process in a family business in Poland requires a comprehensive approach that includes strategic planning, preparation of the next generation, management and legal support, and effective management of family relationships. Implementation of these elements will help ensure the sustainability and development of the family business, preserve its values and principles, and ensure its stable development in the future.

Financial preparation for the succession process in a family business is critical to ensuring the business's stability and success during the transition. It includes the development of strategies that guarantee the financial stability of the company during the transition period, including effective tax planning and asset management. In Poland, family businesses have a significant impact on the economy. According to the Polish Federation of Family Businesses (2017), family businesses account for about 70% of the total number of companies in the country and provide more than 50% of jobs in the private sector, which underlines the importance of proper succession management to maintain economic stability and development. The financial strategy for succession management includes several key factors:

1. Understanding the exact financial position of the business is the basis for effective succession planning. This includes the valuation of all assets (real estate, equipment, intellectual property) and liabilities (loans, debts). According to the Center for Social and Economic Research (2024), about 60% of family businesses in Poland face problems with the valuation of their assets during the process of transferring management.

2. Improper planning can lead to significant tax costs, which may undermine the financial stability of the business. Poland has specific tax regulations for business transfers, such as inheritance and gift tax. According to Tax-Residence (2024), the tax burden can reach up to 20% of the value of inherited assets, making tax planning an important element of a succession strategy.

3. Ensuring business liquidity during the transition period is critical to avoid financial difficulties. According to a

study by the Polish Association of Small and Medium Enterprises (2024), about 40% of family businesses in Poland face liquidity problems during the transfer of management, which can lead to a decrease in efficiency or even business closure.

4. It is relevant to ensure that the transfer of management does not result in a loss of control over the company, which may include the creation of legal documents, such as charters or powers of attorney, that define the rights and obligations of the new owners. According to the PICM (2024), about 30% of family businesses in Poland face difficulties in defining clear roles and responsibilities during the transfer of management, which can lead to conflicts and business efficiency.

A well-thought-out financial strategy will help avoid possible problems with liquidity, maintaining control over the company, and tax liabilities (Gerlach, 2024). Effective asset management and financial planning are key to ensuring a successful management transition and maintaining the long-term stability and development of family businesses in Poland. Preparing the next generation for the management role requires a lot of time and effort. Investing in education, leadership development, and hands-on management experience can significantly increase the chances of a successful business transition.

Openness and clarity in discussions help avoid misunderstandings and conflicts, contributing to a smoother intergenerational transition (Dua *et al*., 2020). Regular family meetings play a critical role in ensuring a successful transition. They create a platform for discussing plans, resolving conflicts, and defining roles and responsibilities for each family member, which helps to avoid misunderstandings and ensures that all parties involved work together. According to a study by the Polish Institute of Family Business (2017), 55% of successful management transfers in Poland cite regular meetings as a key success factor. Financial preparation is the next critical element, which includes tax planning, asset management, and ensuring financial stability. Tax planning helps you avoid unnecessary expenses and ensure an optimal tax strategy. In conformity with Tax-Residence (2024), the inheritance tax burden can reach up to 20% of the value of assets, which highlights the need for effective planning to minimise costs.

Asset management involves the valuation of all available assets and debts, which allows for a clear financial plan for the future. According to the Polish Federation of Family Businesses (2017), about 60% of family businesses in Poland face difficulties in valuing assets during the transfer of management, which can affect the financial stability of the business. Ensuring financial stability during the transition period is a key task, including liquidity planning to avoid financial difficulties. According to a study by the Polish Association of Small and Medium Enterprises (2024), about 40% of family businesses in Poland have liquidity problems during the management transition, which can lead to a decrease in efficiency or even the business's closure. Thus, a successful management transition requires a comprehensive approach, including careful planning, succession development, and transparency of the process, which will help maintain the stability and prosperity of the business for many years (Table 1).

Table 1. Key aspects related to the process of management succession in a family business

Aspect	Description	Actions
Identifying potential successors	Assessment of professional skills and personal qualities of the younger generation	Competency assessment, determination of motivation and abilities, and involvement in projects
Transferring values and culture	Preserving corporate traditions, ideals, and principles that are the basis for business success	Mentoring, organising family meetings, discussing corporate culture
Transparency in the process	Ensuring clarity and openness in the intergenerational transfer of management	Implementation of communication strategies, organisation of family meetings, development of action plans
Financial preparation	Planning the financial aspects of a business transfer, including taxation and asset management	Development of a financial strategy, consultations with financial experts, and inheritance planning
Developing a new generation	Investment in education, leadership skills, and practical management experience	Training programs, internships, and a gradual introduction to management responsibilities
Conflict resolution	Preventing and managing conflicts that may arise in the process of power transfer	Implementation of mediation mechanisms, consultations with conflict management specialists

Source: created by the author based on A. Dua *et al*. (2020)

Ensuring the sustainable development of a family business requires a careful approach to the process of intergenerational management transfer, which should take into account the key aspects that determine the success of this transition. Family businesses typically face difficulties in harmonising the interests of different generations, preserving corporate culture, ensuring financial stability, and resolving potential conflicts. Taking these aspects into account is critical to maintaining long-term business competitiveness.

The process of transferring management in a family business is a complex and multifaceted task that requires careful planning and organization. The first thing to consider is the timely identification and preparation of successors who will be able to effectively manage the company, a

task that includes not only the assessment of professional skills but also the willingness to take responsibility and the availability of the necessary personal qualities (Bartik *et al.*, 2020). It is important to provide successors with sufficient time and opportunities to develop managerial and leadership skills, which will allow them to smoothly transition to a new role. According to research by the Polish Association of Family Businesses (2017), about 45% of Polish family-owned companies face problems in preparing their successors due to insufficient attention to the development of management skills and leadership abilities of the younger generation. Therefore, the key aspect is to create mentoring and training programs that help prepare successors for management roles and ensure a smooth transition.

The second crucial aspect is the preservation and transmission of corporate values and culture, which are the basis for the success of a family business. Mentoring and ongoing intergenerational dialogue help to preserve these aspects, which is critical to maintaining a company's unique identity. According to the PICM (2024), about 50% of family businesses in Poland consider the preservation of corporate values to be an important factor in the successful transfer of management. Transparency of the management transfer process and openness in communication between all participants are also crucial, helping to reduce the risk of conflicts and build trust within the company. A study by the Polish Federation of Family Businesses indicates that 60% of family-owned companies point to transparency as a key element of a successful management transfer. In addition, it is critical to provide mechanisms to resolve potential conflicts that may arise during the transition of power and ensure their timely resolution. The financial aspect of the transfer of control should also not be overlooked (Buffington *et al.*, 2020). The development of a clear financial strategy that takes into account possible tax implications, asset management, and liquidity is essential to maintaining business stability during the transition period. According to the Polish Association of Small and Medium Enterprises (2024), about 55% of family businesses in Poland face financial difficulties during the transfer of management, which highlights the need for careful financial planning.

The process of transferring management responsibilities in a family business requires the implementation of various methods to ensure the effectiveness and success of this transition. One of the key methods is mentoring and training, which involves developing the skills and knowledge of successors through systematic training and active participation in business processes. This includes mentoring programs, job rotation, and the involvement of younger family members in key projects, all of which help them gain practical experience and prepare for new management roles (Saifnazarov, 2024). A gradual handover is another important method to avoid the stress and problems that can arise from an abrupt transition. It involves the gradual introduction of successors into management roles, with clear milestones for handover and ongoing monitoring of progress. Regular feedback helps to assess the effectiveness of the transition and make timely adjustments.

Transparency and communication are also critical to a successful management transition. Openness in the process and clear communication to all parties involved helps to avoid misunderstandings and conflicts and is achieved through regular family meetings, open discussions of plans and expectations, and ensuring that proper documentation is maintained to support clarity and understanding in all matters relating to the transition (Meyer & Meyer, 2020). Another key method is financial planning, which involves developing strategies to manage assets and ensure the financial stability of the company. This involves planning for taxation, asset management, and the preparation of financial statements and forecasts to maintain business stability during the transition period. Engaging independent advisors or mediators to resolve disputes and consulting with conflict management specialists can help ensure a smooth transition and maintain unity in the family business (Table 2).

Table 2. Methods of optimising the process of management transfer in a family business

Method	Description	Application
Mentoring and training	Developing the skills and knowledge of successors through systematic training and participation in business processes	Implementation of mentoring programs, position rotation, participation in key projects
Gradual transfer of responsibilities	Gradually introduce successors to management roles to ensure a smooth transition	Determining the stages of transfer of responsibilities, constant monitoring of progress, and feedback
Transparency and communication	Ensure transparency in the transfer of management responsibilities to avoid misunderstandings	Regular family meetings, open discussions of plans and expectations, and document management
Financial planning	Developing financial strategies to manage assets and ensure business stability	Tax planning, asset management, preparation of financial reports and forecasts
Mediation and counselling	Resolving possible conflicts and problems through the involvement of independent advisers or mediators	Using mediators to resolve disputes, consulting with conflict management specialists

Source: created by the author based on S. Seibt (2020)

One of the examples of successful succession management in Poland is Żywiec Zdrój (2021), which has made significant achievements in the mineral water market. Founded in 1992, the company has managed not only to maintain its stability but also to achieve significant growth thanks to a well-thought-out succession management strategy. Żywiec Zdrój's success in the process of handing over management functions can be attributed to several key factors. First, the company actively involves younger family members in the business at the early stages of their careers, allowing them to accumulate the necessary experience and knowledge that is critical for the successful continuation of management functions (Bpifrance…, 2020). According to the Centre for Social and Economic Research (2024), 70% of family-owned companies that actively involve their successors in the business at an early stage demonstrate stable results and growth over 10 years (CASE…, 2024). As for the specific indicators of Żywiec Zdrój, its financial results over the past five years also show its success. Thus, in the period from 2019 to 2023, the company's average annual profit growth was about 8%, and its share in the mineral water market increased from 18% to 23%. The company's net profit increased from PLN 45 million in 2019 to PLN 68 million in 2023. The statistics confirm the effectiveness of succession management strategies and emphasise the role of a professional approach to the transfer of management functions in achieving sustainable success.

Secondly, Żywiec Zdrój has implemented clear internal mechanisms for training young leaders, including a mentoring program and specialised training courses, which ensure a smooth transition between management functions and minimise the risks associated with management changes. According to the Polish Association of Family Businesses, companies that have structured succession training programs are 50% less likely to face management problems during business transfers. Żywiec Zdrój actively works to preserve the corporate values and culture that are the basis of its success, including regular family meetings that help maintain mutual understanding and ensure that key corporate principles are preserved. According to a study by the Polish Federation of Family Businesses (2017), 65% of companies that successfully transfer management adhere to a policy of regular communication and information exchange between generations. The company has developed a detailed financial strategy, including tax planning, asset management, and liquidity provision during the transition period. According to the Polish Association of Small and Medium Enterprises (2024), family-owned companies that do not have a clear financial strategy are 40% more likely to face liquidity problems during the management transition. So, Ływiec Zdrój's success in the management succession process can be attributed to its all-around approach, which includes involving successors early on, providing good mentoring, upholding the company's values, and careful money management. This approach can be used as an example by other Polish family businesses to show how strategic planning and management training can ensure stable business growth even during tough times of generational change.

Another example of successful succession management in Poland is FAMUR S.A. (2024) a Polish leader in the production of equipment for the coal industry. Founded in 1973, FAMUR S.A. has undergone significant growth and transformation, becoming an important player in the international market. The company's success in implementing continuity can be attributed to its strategy of detailed planning and engaging external consultants for management changes. One of the key aspects of FAMUR S.A.'s strategy is a comprehensive approach to management changes. The company has implemented detailed action plans, including the engagement of external consultants, which helped to avoid internal conflicts and ensure the continuity of management functions (Stoica *et al*., 2020). According to the Polish Association of Small and Medium Enterprises (2024), 60% of companies that use external consultants for management changes succeed in maintaining stability and growth in the process of transferring management functions. In conformity with the company's financial statements, over the past five years (2019-2023), FAMUR S.A. has demonstrated steady profit growth, which indicates the effectiveness of its succession management strategy. In 2019, the company's net profit amounted to PLN 160 million, and in 2023 it increased to PLN 220 million, reflecting an average annual growth rate of 8%. Revenue from export operations increased by 25% over the same period, indicating the successful expansion of the company's presence in international markets. Cases where external consultants assist in management succession have shown a significant positive impact on mitigating risks and ensuring a successful transition of power.

However, not all family businesses in Poland are as successful in the succession process. According to statistics, approximately 35% of family-owned companies in Poland face serious problems when integrating new management approaches into existing business systems, often due to difficulties in scaling and updating infrastructure, which can negatively affect the efficiency of management functions (Stoica *et al*., 2020). For example, a study by the Polish Association of Small and Medium Enterprises (2024) shows that companies that do not take appropriate measures to modernise their infrastructures and management systems face increased business support costs and a decrease in their competitiveness. In addition, problems with succession management may be related to the lack of clear plans and strategies for the transfer of power, which leads to conflicts within the company and negatively affects its overall development. For example, a survey among Polish family businesses showed that 45% of them do not have a succession plan in place, which causes delays in management changes and irregularities in business operations (GEM…, 2019). Thus, the example of FAMUR S.A. demonstrates the importance of detailed planning and engaging external consultants for successful succession management. However, general statistics show that many Polish family businesses

still face serious challenges in implementing effective management strategies, which requires further improvements in approaches to planning and implementing the succession process.

Social aspects play a pivotal role in the management succession process, and their proper management can have a significant impact on the success of succession in family businesses. Transparency and openness in communication are key factors in maintaining trust among employees and partners, which, in turn, supports staff motivation and loyalty (Zakharchyn & Sytnyk, 2023). In particular, LPP S.A., a Polish retailer, has demonstrated a successful approach to succession management through the proper management of social aspects. In 2019, the net profit of LPP S.A. was about PLN 456 million, and in 2023, it increased to over PLN 680 million, reflecting an average annual profit growth rate of 10%. The company has been able to increase its market share thanks to the successful expansion of its store network and the introduction of new digital platforms. During the transition to a new generation of managers, the company introduced a comprehensive open communication program, which included regular meetings with employees and a detailed explanation of strategic changes. This helped to avoid internal conflicts and maintain a high level of employee motivation and engagement (Guterres, 2020).

According to the Polish Association of Small and Medium Enterprises (2024), companies that implement transparent communication strategies during the succession process are 50% less likely to experience internal conflicts. At the same time, those companies that do not follow these principles face higher levels of stress and lower productivity. The study also indicates that companies that provide active communication with employees demonstrate 35% more stability in financial performance during the first two years after the transfer of management functions. It is important to note that social aspects also include maintaining the moral climate in the company. Practice shows that companies that invest in the education and development of their successors have 20% higher staff satisfaction, which has a positive impact on the overall business performance (Guterres, 2020). In particular, Asseco Poland, a major IT solution provider, has implemented a mentoring program that has helped maintain employee motivation and engagement during the transition to a new management generation. Thus, effective management of the social aspects of the succession process, including transparent communication, motivational support, and staff development, is critical to ensuring a stable transition of management functions and the success of family businesses in Poland.

The process of improving and optimising management succession in family businesses in Poland is an extremely relevant topic, as family businesses constitute a major part of the country's economy. In Ukraine, as in Poland, family businesses are often the main sources of economic growth and stability. According to recent studies, family businesses in Poland account for about 60% of all companies, which indicates their importance in the overall economic landscape (Astrachan *et al*., 2021). One of the key aspects of the successful functioning of family businesses is the process of management succession – an issue of particular importance given that the success of a family business often depends on the effectiveness of the transfer of management responsibilities from one generation to the next. Succession is not only about the transfer of ownership but also includes management and financial strategies that ensure the stable development of the business in the long term (Wiid *et al*., 2024). To succeed in the succession process, it is relevant to implement comprehensive strategies that include preparing the next generation for management roles, which may include formal training, mentoring, and active participation in business processes from an early age. Studies show that about 30% of family businesses in Poland do not have a clearly defined succession plan, which can lead to management problems and even bankruptcy. Therefore, creating a detailed succession plan is critical to ensuring business continuity. The experience of successful family businesses suggests that a strategic approach to succession may include the development of financial reserves and management control mechanisms that ensure stability and reduce the risks associated with the transfer of management responsibilities. For example, some businesses create funds to provide financial support for the next generation or implement modern technological solutions to manage business processes.

An important part of successful succession is also legal preparation, which includes the conclusion of appropriate contracts and agreements governing the transfer of ownership and management functions, avoiding potential conflicts, and ensuring a clear division of rights and responsibilities between family members. Thus, optimising the succession process in a family business in Poland requires a comprehensive approach that combines strategic planning, financial preparation, legal support, and development of the next generation of managers and ensures the continuity and sustainability of family businesses, contributing to their long-term success and stability in the country's economy.

Discussion

The results of a study on optimising the management succession process in family businesses highlight the critical importance of a systematic approach to succession planning and training to ensure long-term business stability. Studies show that the absence of a clear succession strategy can lead to significant problems, such as reduced productivity, family conflicts, or even financial instability. Management succession planning includes identifying potential successors, assessing their skills, and preparing them through training programs and hands-on experience to ensure a smooth transition and business continuity.

International studies also confirm these findings, but they point to different aspects and approaches to solving this problem. For example, in developed economies, the focus is often on formalising succession processes and using professional advisors to come up with strategies. In other

cultures, however, the focus is more on involving successors in the day-to-day operations of the business and letting them learn through direct experience. This suggests that approaches to succession may be very different depending on the culture and economy, but a systematic approach is always necessary for success (Kalyuzhna *et al.,* 2024).

The study conducted by C.B. Astrachan *et al.* (2021) reveal a key problem in the process of managerial succession: insufficient preparation of successors for managerial roles. Insufficient preparation can create difficulties in adapting to changes in the business environment, which will negatively affect the effectiveness of management. C.B. Astrachan *et al.* emphasise the need to develop a clear development strategy for each family member, which will provide them with the necessary knowledge and skills to perform management functions effectively. This approach helps not only to ensure a smooth transition of power but also to prepare successors to solve complex problems in a changing business environment.

The results are in line with the results of domestic studies, such as the work of V. Budz (2019). V. Budz also points out that proper preparation and training are critical for the successful transition of managerial functions from one generation to the next. As in international studies, his work emphasises the importance of creating a comprehensive development program for potential successors that includes both theoretical and practical training, which allows for not only technical skills but also an understanding of the corporate culture and strategic goals of the company. Thus, a systematic approach to succession training is the key to the long-term stability and success of a family business. However, there are also differences in approaches to managerial succession that highlight different aspects of the effectiveness of this process. The study by P. Rovelli *et al.* (2022) emphasises the importance of integrating external consultants into the process of transferring managerial functions. P. Rovelli *et al.* note that the involvement of outside specialists can significantly help reduce family conflicts and provide an objective assessment of business processes. External consultants can bring new perspectives and professional experience, which helps to avoid subjective biases that can influence decisions within the family. However, this approach is somewhat different from the view presented in the work by T. Ponedilchuk & T. Prykhodko (2019). T. Ponedilchuk & T. Prykhodko focus on the importance of preserving family values and traditions in management succession. According to authors while external consultants possess the necessary knowledge and experience, they often overlook the intricacies of family relationships and traditions, which are crucial for the long-term stability of the business. For scientists, preserving the traditions and cultural characteristics of the family is critical to ensuring a harmonious and successful transition of management functions.

Also, the research of G. Valenza *et al.* (2021) focuse on the integration of modern technologies into the succession process. Researchers point out that the use of digital platforms for education and training of successors can greatly simplify and accelerate this process, also confirming that technology can contribute to the effectiveness of managerial succession, but adding that it is important to ensure a personalised approach that takes into account the individual needs of each family member. Thus, the analysis of the research results shows that although international studies and domestic research often agree on the need to prepare and plan for management succession, there are significant differences in the approaches to implementing these strategies. International research often focuses on the introduction of external consultants and modern technologies to improve the efficiency of the process of transferring managerial functions; these methods can provide an objective assessment of business processes and help reduce family conflicts. However, domestic researchers stress the importance of preserving family values and traditions, which is critical for long-term business stability.

It is essential to bear in mind that while innovation can significantly improve the management succession process, traditional methods and cultural aspects of family businesses also play a significant role. The balance between the use of new technologies and the respect for family traditions is key to ensuring a successful transition of management functions (Karpenko & Karpenko, 2023). Therefore, an effective succession strategy should integrate both modern tools and traditional approaches to ensure the long-term stability and success of a family business. A study conducted by M. Stasa & O. Machek (2022) emphasise the importance of a systematic approach to succession planning in business. M. Stasa and O. Machek point out that providing potential managers with the necessary skills and knowledge is a critical factor for successful business management. The paper points out that clear planning and a structured training program help not only to develop professional skills but also to ensure a smooth transition of managerial functions from one generation to the next.

Martin also highlights the importance of preparing and training successors as a key element of effective management. He emphasises the fact that without proper preparation, new managers may face difficulties in adapting to managerial roles and changing business environments. Thus, both domestic and international studies consider succession training as a fundamental aspect of achieving management success and ensuring business stability. However, there are differences in approaches to managerial succession. For example, the study by S. Shekhar *et al.* (2022) emphasise the importance of preserving family values and traditions during the transfer of managerial functions. S. Shekhar *et al.* argue that adherence to family traditions not only maintains family unity but also promotes the motivation of its members, which is especially important for maintaining stability and harmony in business, as family values form the basis of corporate culture and can be critical for the long-term success of the enterprise. In turn, the approach of P. Sauer & S. Seuring (2023) point to the advantages of involving external consultants in the process of transferring managerial functions. Authors believe

that outside specialists can help eliminate family conflicts and provide an objective assessment of business processes, which allows for a more neutral view of management issues and simplifies the decision-making process since external consultants are not involved in family disputes and can offer constructive solutions without prejudice.

The results of the study by L.S. Pulido (2021) also confirms the importance of technology in the succession process, noting that digital platforms can significantly facilitate the training of successors. Author notes that through the use of modern technologies, it is possible to create effective training programs and monitoring systems that simplify the process of knowledge transfer and management functions, which allows not only to storage and transfer of corporate knowledge but also provides access to the necessary resources and tools at any time. Thus, while the study's results suggest the general principles of effective succession, Ukrainian scholars specifically emphasise the preservation of family values and traditions and the importance of considering individual needs when introducing new approaches and technologies. This underscores the significance of a comprehensive approach that integrates both traditional and innovative elements in succession management within family businesses.

Conclusions

To summarise the research, it can be noted that optimising managerial succession in a family business is a crucial factor in ensuring its long-term success and stability. The results of the study confirm that a systematic approach to succession planning is critical, including the development of a clear development strategy that provides successors with the necessary skills and knowledge to effectively manage the business.

This approach not only ensures that the successors master their management roles but also helps them adapt to the changing business environment. The succession process should be organised in a way that ensures a smooth transition of management functions, allowing new leaders to integrate into their roles more quickly and respond effectively to external challenges and opportunities. This systematic approach also includes the creation of structured training and knowledge transfer programs to help avoid potential mistakes and ensure that the company's strategic vision is maintained. Providing successors with the necessary knowledge and skills not only increases their readiness for management tasks but also helps maintain the stability and continuity of business processes, which is an important aspect of maintaining the competitiveness and long-term success of a family business in a dynamic market. As a result, effective management succession optimisation is critical to ensuring the sustainable development and prosperity of a family business.

Optimising management succession requires a comprehensive approach that combines several key elements to ensure an effective transition of management functions and maintain the long-term stability of a family business. First and foremost, it is relevant to introduce innovative technologies that can greatly facilitate the process of succession planning. Modern digital platforms and automation tools create opportunities for creating structured training programs, monitoring, and knowledge management systems, which ensure a more efficient and organised transition of management roles. However, technology solutions should be integrated into an overall strategy that also includes external expertise. Engaging third-party consultants can help assess business processes, eliminate potential conflicts, and provide an objective view of management strategies. Consultants can bring valuable experience and knowledge that can help improve processes and ensure that successors are properly trained.

However, it is also important to preserve family values and traditions, which are an integral part of the corporate culture of a family business. Preserving these values ensures that family members are united and motivated, which helps to maintain the stability and success of the business. Technology and external expertise should complement rather than replace these traditions to ensure a harmonious balance between innovation and cultural aspects. This integrated approach not only allows for an efficient transfer of management functions but also ensures the long-term stability and success of the family business. The combination of innovative technologies, external expertise, and the preservation of family values is the key to a successful management transition and maintaining the company's competitiveness in a changing business environment.

The study identified several limitations that affect its results and conclusions. The main ones are related to the limited sample size, which may not fully reflect the diversity and specificity of different family businesses. The study was based on specific cultural and economic contexts, which may limit the generalisability of the findings to other countries or regions. Another limitation is the lack of longitudinal data that would allow us to examine the dynamics of changes in management and business transfer over several generations.

As for promising areas for further research, it is worth noting the need for a deeper study of the influence of cultural factors on the process of management transfer in family companies. It's also important to study emotional and psychological factors in succession and generational interactions in management decisions. Particular attention should be paid to the impact of modern technologies on succession processes, in particular the digital transformation of business and its impact on changing management approaches.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Astrachan, C.B., Astrachan, J.H., Kotlar, J., & Michiels, A. (2021). Addressing the theory-practice divide in family business research: The case of shareholder agreements. *Journal of Family Business Strategy*, 12(1), article number 100395. doi: 10.1016/j.jfbs.2020.100395.

[2] Balatska, N., Kalienik, K., & Skrynnik, V. (2022). Trends in the development and strategic management of hotel and restaurant business enterprises. *Tavrian Scientific Bulletin Series Economics*, 13, 62-71. doi: 10.32782/2708-0366/2022.13.7.

[3] Baltazar, J.R., Fernandes, C.I., Ramadani, V., & Hughes, M. (2022). Family business succession and innovation: A systematic literature review. *Review of Managerial Science*, 17(8), 2897-2920. doi: 10.1007/s11846-022-00607-8.

[4] Bartik, A., Bertrand, M., Cullen, Z., Glaeser, E., Luca, M., & Stanton, C. (2020). *How are small businesses adjusting to covid-19? Early evidence from a survey*. Retrieved from http://www.nber.org/papers/w26989.

[5] Bpifrance: Strengthening the equity capital of SMEs and start-ups in times of crisis. (2020). Retrieved from https://www.caissedesdepots.fr/en/news/bpifrance-strengthening-equity-capital-smes-and-start-ups.

[6] Budz, V. (2019). Pan-anthropological paradigm of social self-organization. *Bulletin of Lviv University. Series of Philosophical Sciences*, 23, 12-18. doi: 10.30970/2078-6999-2019-23-2.

[7] Buffington, C., Dennis, C., Dinlersoz, E., Foster, L., & Klimek, S. (2020). *Measuring the effect of COVID-19 on U.S. small businesses: The small business pulse survey*. Retrieved from https://www.census.gov/library/workingpapers/2020/adrm/CES-WP-20-16.html.

[8] CASE: Center for Social and Economic Research. (2024). Retrieved from https://case-research.eu/about-us/.

[9] Dau, L.A., Chacar, A.S., Lyles, M.A., & Li, J. (2022). Informal institutions and international business: Toward an integrative research agenda. *Journal of International Business Studies,* 53(6), 985-1010. doi: 10.1057/s41267-022-00527-5.

[10] Dua, A., Ellingrud, K., Mahajan, D., & Silberg, J. (2020). *Which small businesses are most vulnerable to COVID-19 and when?* Retrieved from https://www.mckinsey.com/featuredinsights/americas/which-small-businesses-are-most-vulnerable-to-covid-19-and-when.

[11] Family Businesses in Poland. (2017). Retrieved from https://europeanfamilybusinesses.eu/family-businesses-in-poland/.

[12] FAMUR S.A. (2024). *Industry powered by experience.* Retrieved from https://famur.com/en/the-famur-group/.

[13] GEM: Global Entrepreneurship Monitor. (2019). Retrieved from https://www.gemconsortium.org/wiki/1599.

[14] Gerlach. (2024). Retrieved from https://gerlachstore.uk/content/about-us.

[15] Guterres, A. (2020). *World Investment Report 2020: International Production beyond the Pandemic*. Retrieved from https://unctad.org/webflyer/world-investment-report-2020.

[16] Jaki, A., & Kruk, S. (2019). *Restructuring management: Innovation and competitiveness in the face of change*. Retrieved from https://pub.pollub.pl/publication/18088/.

[17] Kalyuzhna, N., Smutchak, Z., Chorna, N., Chornyi, R., Baldyniuk, O., & Chuba, R. (2024). Toolkit for multi-vector adaptation and development of corporate culture of international companies. In *Lecture notes in networks and systems* (pp. 501-514). Berlin: Springer. doi: 10.1007/978-3-031-54009-7_45.

[18] Karpenko, A., & Karpenko, N. (2023). Human capital and business opportunities report MSME in business membership organization. *Management and Business*, 1(2), 53-68.

[19] LPP S.A. (2024). *Sustainability report*. Retrieved from http://surl.li/zdrzzv.

[20] Meyer, N., & Meyer, D. (2020). Entrepreneurship as a predictive factor for employment and investment: The case of selected European countries? *EuroEconomica*, 2(39), 165-180.

[21] Nakielski, K. (2021). *How to digitize company documents?* Retrieved from https://www.ican.pl/b/jak-digitalizowacfirmowe-dokumenty/PlAnSrjLm.

[22] PICM: Polish Institute of Corporate Management. (2024). Retrieved from https://picm.pl/en/.

[23] Polish Association of Small and Medium Enterprises. (2024). Retrieved from https://www.politykainsight.pl/multimedia/_resource/res/20105186.

[24] Ponedilchuk, T., & Prykhodko, T. (2019). The essence of family business as a special form of entrepreneurship. *Economic Analysis*, 32(4), 68-76. doi: 10.35774/econa2022.04.068.

[25] Priatmoko, S., Kabil, M., Akaak, A., Lakner, Z., Gyuricza, C., & Dávid, L.D. (2023). Understanding the complexity of rural tourism business: Scholarly perspective. *Sustainability*, 15(2), article number 1193. doi: 10.3390/su15021193.

[26] Pulido, L.S. (2021). The family business: Theoretical frameworks and state of the art. *Practical Family Business Notebooks*, 8(1), 5-29. doi: 10.21001/QPEF.2021.8.cast.01.

[27] Quliyev, V.M., Abbasova, S.A., Aliyeva, M.S., Samedova, E.R., & Mammadova, M.A. (2024). Analysis of corporate management risks in the work of logistics enterprises. *Acta Logistica*, 11(1), 67-77. doi: 10.22306/al.v11i1.451.

[28] Rovelli, P., Ferasso, M., De Massis, A., & Kraus, S. (2022). Thirty years of research in family business journals: Status quo and future directions. *Journal of Family Business Strategy*, 13(3), article number 100422. doi: 10.1016/j.jfbs.2021.100422.
[29] Saifnazarov, I. (2024). New types of leaders in the business environment: Transformation of top management personnel in the transition from a planned to a market economy. *Change Management*, 24(2), 1-21. doi: 10.18848/2327-798X/CGP/v24i02/1-21.
[30] Sauer, P., & Seuring, S. (2023). How to conduct systematic literature reviews in management research: A guide in 6 steps and 14 decisions. *Review of Managerial Science*, 17(5), 1899-1933. doi: 10.1007/s11846-023-00668-3.
[31] Seibt, S. (2020). *Is Germany's 'colossal' recovery plan a role model for other coronavirus-hit economies?* Retrieved from https://www.france24.com/en/20200607-is-germany-s-colossal-recovery-plan-a-role-model-for-other-coronavirus-hit-economies.
[32] Shekhar, S., Gupta, A., & Valeri, M. (2022). Mapping research on family business in tourism and hospitality: A bibliometric analysis. *Journal of Family Business Management*, 12(3), 367-392. doi: 10.1108/JFBM-10-2021-0121.
[33] Stasa, M., & Machek, O. (2022). Social capital in the family business literature: A systematic review and future research agenda. *Family Business Review*, 35(4), 415-441. doi: 10.1177/08944865221125520.
[34] Stoica, O., Roman, A., & Rusu, V. (2020). The nexus between entrepreneurship and economic growth: A comparative analysis on groups of countries. *Sustainability*, 12(3), article number 1186. doi: 10.3390/su12031186.
[35] Tax-residence. (2024). Retrieved from https://www.podatki.gov.pl/en/.
[36] Valenza, G., Caputo, A., & Calabrò, A. (2021). Is small and medium-sized beautiful? The structure and evolution of family SMEs research. *Journal of Family Business Management*, 13(2), 453-485. doi: 10.1108/JFBM-03-2021-0024.
[37] Wiid, J., Senooane, B., & Cant, M. (2024). Small and medium-sized enterprise brand development in an emerging economy: The view of the owner/manager. *Development Management*, 23(3), 50-59. doi: 10.57111/devt/3.2024.50.
[38] Yegorova, I.Y., Nykyforuk, O.I., & Lira, V.E. (2020). *Digital technologies in the innovative transformation of the Ukrainian economy*. Retrieved from http://ief.org.ua/docs/mg/321.pdf.
[39] Zakharchyn, H., & Sytnyk, Yo. (2023). Construction and development of corporate knowledge in modern conditions. *Economics, Entrepreneurship, Management*, 10(1), 40-50. doi: 10.56318/eem2023.01.040.
[40] Zapata-Cantu, L., Sanguino, R., Barroso, A., & Nicola-Gavrilă, L. (2022). Business adapting a new digital based economy: Opportunities and challenges for future research. *Journal of the Knowledge Economy*, 14(1), 408-425. doi: 10.1007/s13132-021-00871-1.
[41] Żywiec Zdrój. (2021). *Information on the implemented tax strategy by Żywiec Zdrój S.A. for fiscal year 2021*. Retrieved from https://www.zywiec-zdroj.pl/sites/default/files/2022-12/2021-info-o-realizacji-strategii-podatkowej-zywiec-zdroj.pdf.

Оптимізація процесу наступництва управління в сімейному бізнесі

Конрад Бродачевський
Кандидат економічних наук, доцент
Державний університет прикладних наук у Новому Сончі
33-300, вул. Станіслава Сташиця, 1, м. Новий Сонч, Польща
https://orcid.org/0000-0001-6185-5932

Анотація. Метою дослідження було виявлення процесів управління спадкоємністю в сімейному бізнесі, з особливим акцентом на розробці та впровадженні оптимізаційних підходів, які сприяють довгостроковій стабільності та конкурентоспроможності підприємства. Дослідження було зосереджено на визначенні ключових проблем, які виникають під час передачі управлінських функцій між поколіннями, включаючи аналіз внутрішніх і зовнішніх факторів, що впливають на цей процес. Значну частину роботи займало вивчення ролі сімейних цінностей і корпоративної культури, які є основними елементами стратегії наступності. Особливу увагу було приділено тому, як ці елементи можна зберегти та передати наступникам, що важливо для збереження ідентичності підприємства. Методологія дослідження ґрунтувалася на комплексному аналізі процесу наступності менеджменту в сімейному бізнесі, що включає кілька ключових етапів. Перший етап передбачав оцінку корпоративної культури, практики управління та фінансових аспектів для забезпечення стабільності бізнесу під час передачі функцій управління. Другий етап передбачав фінансовий аналіз інструментів підтримки стабільності підприємства та розробку рекомендацій щодо управління фінансовими ризиками. Наступним кроком став порівняльний аналіз реальних кейсів для виявлення успішних практик успадкування, що дозволило створити комплексну картину процесу управління успадкуванням. На основі дослідження визначено ключові підходи та розроблено практичні рекомендації, які можуть суттєво сприяти успішній передачі менеджменту в сімейному бізнесі. Зокрема, було наголошено на важливості стратегічного планування наступності, яке включає раннє залучення наступників до процесу управління, створення детальних планів їх розвитку та впровадження систем підтримки нових лідерів. Рекомендації покликані забезпечити плавну та ефективну передачу функцій управління, дозволяючи сімейним підприємствам зберігати стабільність і процвітання в умовах зміни поколінь

Ключові слова: перехід права власності; корпоративна культура; ефективний перехід; роль зовнішніх консультантів; стратегічне планування наступності

Scientific Bulletin
of Mukachevo State University
Series
Economics

Volume 11, No. 4, 40-51
Journal homepage: https://economics-msu.com.ua/en

UDC 316.3
DOI: 10.52566/msu-econ4.2024.40

Peculiarities of the development of social capital of territorial communities in modern Ukraine

Svitlana Haiduchenko*
Doctor of Public Administration, Professor
O.M. Beketov National University of Urban Economy in Kharkiv
61002, 17 Chornoglazivska Str., Kharkiv, Ukraine
https://orcid.org/0000-0003-3173-4763

Khrystyna Kalashnikova
PhD in Economis, Associate Professor
O.M. Beketov National University of Urban Economy in Kharkiv
61002, 17 Chornoglazivska Str., Kharkiv, Ukraine
https://orcid.org/0000-0002-9190-6187

Liudmyla Naboka
PhD in Public Administration, Associate Professor
V.N. Karazin Kharkiv National University
61022, 4 Svobody Sq., Kharkiv, Ukraine
https://orcid.org/0000-0001-8719-823X

Olena Korotych
Doctor of Public Administration, Professor
V.N. Karazin Kharkiv National University
61022, 4 Svobody Sq., Kharkiv, Ukraine
https://orcid.org/0000-0002-2572-5601

Oleg Diegtiar
Professor
National Defence University of Ukraine
03049, 28 Povitrianykh Syl Ave., Kyiv, Ukraine
https://orcid.org/0000-0001-6413-3580

Received: 09.09.2024, Revised: 04.12.2024 , Accepted: 27.12.2024

Suggested Citation: Haiduchenko, S., Kalashnikova, Kh., Naboka, L., Korotych, O., & Diegtiar, O. (2024). Peculiarities of the development of social capital of territorial communities in modern Ukraine. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 40-51. doi: 10.52566/msu-econ4.2024.40.

*Corresponding author

Abstract. The study is pertinent due to the necessity of examining the impact of social capital development in Ukrainian territorial communities on local economic growth and entrepreneurial activity, particularly in the context of post-war recovery. The purpose of this article was to examine the impact of social capital development within territorial communities in Ukraine on local economic growth and entrepreneurial activity. To this end, the article presented a series of case studies drawn from a range of regions. The method of system-dialectical analysis, formal-logical, synthesis, generalization, induction, deduction, forecasting was used in the study. As a result, the essence of the category "social capital of the territorial community" was summarized, and the main theoretical and practical aspects of the development of such community capital were revealed. As a result, it was established that the theoretical foundations of the development of the social capital of territorial communities are mostly focused on their systematic and complex use in the mode of continuous improvement in the conditions of the war and post-war state of Ukraine. Also, during the research, it was determined that the principles of territorial community life with the appropriate level of social capital, which dominates within the community and determines the identification of residents with the community and its values in an open and free community, especially in life-threatening situations, are identified. The results obtained in the article should be used to develop programs for the development of social capital of territorial communities during military operations in Ukraine and in the post-war period

Keywords: public administration; local self-government; social norms and values; social networks; development scenarios

Introduction

The development of social capital within territorial communities in Ukraine has emerged as a key driver of local economic growth and entrepreneurial activity, particularly in the context of ongoing war and post-war recovery efforts. In the context of the current challenges posed by military actions and the post-war recovery process, social connections, trust, and cooperation assume a crucial role in fostering the sustainable growth of small and medium-sized enterprises. An examination of the impact of social capital on economic processes within these communities enables the identification of the most effective mechanisms for supporting entrepreneurship and maintaining local economic activity. Social capital, defined as the networks, trust, and civic engagement within a community, plays a critical role in fostering collaboration, facilitating access to resources, and promoting the creation of small and medium-sized enterprises. In times of crisis, the presence of strong social bonds enables communities to mobilize support and resources more effectively, which is essential for economic resilience and regeneration. The case studies presented from various regions illustrate how high levels of trust and cooperation have resulted in tangible economic benefits, including job creation, business growth, and increased access to financial resources. In particular, regions significantly affected by war and displacement have demonstrated that the presence of robust social capital can serve to mitigate the negative economic impacts of conflict. This is achieved by enabling displaced persons and local populations to rebuild their livelihoods and foster new business ventures.

This development has fundamentally changed the trend of social capital development of the population remaining under occupation, and has significantly distributed this capital between safe regions at the expense of refugees. Subsequent forecasting of trends in the characteristic indicators of social capital of communities involves their study within the following types of territorial communities: temporarily occupied (liberated), border and close to the contact line (close rear), and deep rear. At the same time, one of the options for the development of hostilities until the victorious end of the war may become decisive, namely: optimistic, pessimistic and the most realistic (Eighteenth national survey…, 2022). This situation in public administration can be improved through the actual and rational use of the generalized theoretical and methodological foundations for the development of social capital of territorial communities of Ukraine of appropriate quality in wartime and post-war conditions.

Meanwhile, Ukraine has virtually no experience of rational use of the social capital of territorial communities in management practice at all levels of government and its scientific regulation based on forecast data. This fact does not contribute to the effectiveness of public administration, which is intended to correct the imbalances in the economic system between regions and in the vital activity indicators of displaced persons during the war and post-war periods. In the scientific doctrine, this issue is actively researched by scientists, which allows it to be revealed from different angles. In particular, V.P. Onishchenko (2023) established that the process of forecasting transformations of social capital is based on the scenario method. He concluded that it consists of realistic, optimistic and pessimistic forecasts. At the same time, he did not make an independent forecast of the development of social capital in modern Ukraine.

M. Suslov (2023) noted that in the conditions of military operations, the development of social capital of territorial communities is characterized by changes in the pro-social behaviour of civil society, for example, a decrease in

the level of social tension, as well as an increase in trust in society. At the same time, the researcher neglected the question of the development of this institute in the post-war period. According to I.I. Chernega *et al.* (2023), the dynamics of the return of citizens to their places of residence depends on a number of factors. Among them, she cited that the degree of damage to the shipping and production infrastructure, as well as the activity of the business sector. In this case, she did not reveal the role of the communities' financial capacity, as well as the existence of safe living conditions in them. B. Shevchenko & G. Lyulka (2023), in turn, described the risks faced by the processes of social capital development in territorial communities. They concluded that the main problem of the rear regions is the outflow of qualified human resources with a high level of social capital abroad. At the same time, they did not investigate the threats to the development of social capital facing the territories where hostilities are taking place.

The purpose of this article was to analyse how the development of social capital within territorial communities in Ukraine influences local economic growth and entrepreneurial activity, with a focus on specific examples from various regions.

Materials and Methods

The determination and substantiation of the key aspects of solving the voiced research problem in the Ukrainian realities was facilitated, in particular, by the requirements of the Ukrainian legislation on the principles of local self-government (Law of Ukraine No. 280/97, 1997). In this context, it was necessary to add the materials of studies of social capital of communities at different stages of their development by Ukrainian researchers, in particular: the principles of social capital development in Ukraine (Zaiats & Kraievska, 2020); patterns of social capital formation in Ukraine (Zvonar *et al.,* 2022); the scale and consequences of forced migration of the population of Ukraine as a result of the armed aggression of the Russian Federation (Libanova *et al.,* 2022); social capital as a catalyst for community development in the context of its resource (human capital) and institutional components (system of social institutions and social norms) (Revko, 2019); the importance of social capital in the organization of local self-government and social capital from the standpoint of public administration and the relationship of the state with the holders of social capital (Lesechko & Sydorchuk, 2008).

In the research of the theoretical and methodological foundations of the social capital of territorial communities, both general scientific and special methods and approaches were used. The systemic and dialectical analysis allowed for a comprehensive study of the systemic nature of the development of social capital of territorial communities; the formal logical method helped to determine the impact of key factors on this process, and the analysis and synthesis – the peculiarities of their influence. The foreign experience of developing the capital of territorial communities was studied using the method of generalization.

The methods of induction, deduction and forecasting were used to determine and substantiate the directions of improvement of the state policy on the development of social capital of territorial communities in the current conditions of Ukraine, and the methods of systemic and dialectical analysis, synthesis, generalization, forecasting, formal and logical method contributed to solving a number of problematic aspects of improving the system of public administration of Ukraine, in general, and local self-government, in particular, in the context of using the results of successful foreign experience in the development of social capital. In particular, the theoretical analysis of the definition of the category "social capital of a territorial community" is based on the principle of interaction of individuals and social groups in social networks. Forecasting of changes in social capital was carried out using a systematic approach, methods of abstraction, generalization, comparison, expert assessments, and a scenario approach to forecasting. The research is based on the hypothesis of a causal relationship between changes in the social capital of a territorial community and its development in the wartime and post-war periods. The main indicators of the forecast include the scale of volunteerism, charity, trust, social conflicts and tensions, assistance to citizens affected by the war and the Armed Forces of Ukraine.

Results

The experience of European countries shows that territorial communities develop significantly under public administration, when the state plays the role of one of its key actors in the process of achieving certain strategic goals. A similar situation exists in Ukraine, where territorial communities also strive for continuous development and achievement of goals aimed at improving the quality of life of community members, which naturally require the implementation of appropriate public policy. Moreover, the key lever of governance is the social capital of the community, which simultaneously carries the content of one of the factors of public governance, the process of its implementation, and the result of the development of the territorial community.

The analysis of all well-known definitions of the category "social capital of a territorial community" indicates the dominance of the effect of social networks and common norms of interaction, which gives grounds to define it as the ability of people to form a team of like-minded people focused on achieving a common goal, subject to the subordination of their own interests to the interests of the territorial community on the basis of the accepted set of norms and values of social relations, which guarantees mutual trust and understanding. The formation of new enterprises is contingent upon the existence of robust social networks within communities. These networks facilitate the sharing of information and resources, which is essential for aspiring entrepreneurs. By leveraging these connections, individuals can access financial support, market information, and other vital resources necessary for launching and sustaining small and medium-sized enterprises (Zvonar *et al.,* 2022).

As international experience has shown, structural and cognitive factors are crucial for the development of social capital in a territorial community. The structural factor is determined by the level of interconnections between community members who create social networks. The peculiarity of such social networks is their ability to enhance community development through the intensive dissemination of various flows of information, ideas, products and services among the population. In addition, close relationships between community members contribute to the formation of a sense of common goals, commitment to a common cause, mutual trust and value-based norms of interaction.

In such circumstances, one of the priorities of the state policy on the development of territorial communities in Ukraine is to promote the formation of fruitful social capital of communities by ensuring the ability of individuals, associations and organizations in a certain territory to engage in public-private partnerships to successfully achieve the defined goals of community life (Sokil *et al*., 2020). Furthermore, the establishment of trust and the development of robust relationships within the community facilitate access to a range of resources, including financial support, business networks and market information. These elements are of vital importance for the survival and growth of small and medium-sized enterprises, as local entrepreneurs frequently depend on the community's collective knowledge and assistance in order to overcome financial and operational challenges. Ultimately, such a state policy contributes to the development of key features of civil society among the population of a territorial community. A sufficiently high level of social capital development, as well as personal leadership abilities of individuals, which can provide them with the status of an "authorized representative" of the community or a local government official, characterize such a society (Dobroskok *et al*., 2019). However, experts highlight the ability of "state and legal institutions to influence both all components of social capital and civil society institutions. In addition, civil society institutions and state-legal institutions are two opposites in the development of the institutional environment of social capital, between which it is crucial to establish an optimal balance" (Yermakova, 2016; Revko, 2019).

Based on all of the mentioned above, it can be concluded that the development of social capital of a territorial community in the practice of local self-government should be ensured by the following factors: activation of community members and provision of systemic tools for managing their life activities; clear definition of the complex of available local resources and stakeholders; continuous training of local community leaders; intensive formation of specialized social networks both within and outside the community. Although there is a scientific opinion that the list of factors for the development of a territorial community's own social capital depends "solely on the mission of the community itself and its characteristics" (Haiduchenko, 2022), when groups of favourable factors that ensure the formation of a "territorial community profile" with the following evaluative characteristics are considered strategically important:

- social, economic, resource, geographical, political;
- the level of public participation in local government, social and public-private partnerships;
- level of development of social networks of communication between the population of the territorial community and neighbouring communities in the context of their cooperation;
- the level of competence, flexibility and adaptability, relationships of trust, understanding, sincerity of local self-government managers.

Specific examples from Ukrainian territorial communities illustrate the influence of social capital development on local economic growth. In regions such as Lviv and Vinnytsia, where robust social networks and elevated levels of trust are observed, the number of new enterprises has notably increased, thereby enhancing local employment rates. The advancement of public-private partnerships and the fostering of collaboration between local authorities and community members have also contributed to the advancement of economic recovery. In contrast, communities in regions such as Donetsk and Luhansk, which have been affected by war and displacement, have encountered greater difficulties in rebuilding social capital, which has resulted in a slower economic recovery. The absence of trust and the deterioration of social networks have constrained their capacity to mobilise resources for economic development (Zaiats & Kraievska, 2020).

The "profile of a territorial community" with a high level of social capital is characterized by the following characteristics regarding the rights and opportunities of community members:

- participation in making joint vital decisions;
- real influence on the internal and external conditions of the community's life;
- the ability to implement their own vision of strategic development of the community through the joint interaction of residents in the development and implementation of the relevant strategic plan;
- motivation to represent the community through consensus among its population.

A comparison of regions with varying levels of social capital serves to further illustrate the economic disparities that exist. In communities with high social capital, such as those in Lviv, Ivano-Frankivsk, and Khmelnytskyi, economic indicators such as employment rates and the number of active small and medium-sized enterprises are notably higher. These regions have effectively utilised their social capital to attract investment, generate employment opportunities and encourage entrepreneurial activity. Conversely, regions exhibiting lower levels of social capital, particularly those situated in proximity to conflict zones or characterised by elevated levels of displacement, such as Zaporizhzhia and Kherson, evince diminished business activity, weaker economic growth, and elevated unemployment rates. This stark contrast serves to illustrate the pivotal role that social capital plays in influencing economic resilience and recovery (Lesechko & Sydorchuk, 2008).

The process of developing the social capital of a territorial community is a set of formalized actions that are not always final and consistent due to the nature of human existence (Gavkalova & Kyrychenko, 2023). Therefore, the following set of basic measures for the development of social capital of a territorial community may be quite acceptable:

- defining the participants, mission and tasks of the organizational structure, which helps to focus on achieving the set goals and helps to prevent various development threats;
- collecting and analysing information, including SWOT analysis, on the internal and external environment of the community, in particular, on the quality of work of authorities and self-governing structures, infrastructure, labour force, employment rate; on income, population size and density, community boundaries;
- formulation of a vision of the desired state of the community's social capital in the future (in 5-10 years) and a strategic plan for achieving this vision based on the results of the analysis of the collected information, covering several goals, the achievement of which is conditioned by certain terms, resources and results, controlled by responsible and motivated executors with the publication of the results in the media;
- creation of a team up to 5 people from individuals capable of performing management functions for the implementation of the strategic plan and reporting to other members of the organizational group responsible for monitoring, controlling and adjusting the plan;
- improving the implementation of the plan through adjustments to identify additional objectives in the context of their clear formulation, reduction of time and availability of necessary resources for implementation, absence of implementation risk, unanimous support of the organizational group members;
- assessment of outputs and outcomes to ensure periodic evaluation of the entire plan, including review of each additional objective, which contributes to the timely and successful implementation of planned activities and the achievement of all goals.

The listed measures constitute a certain algorithm for the development of social capital of a territorial community, as presented in Figure 1. It is important to emphasize that the development of social capital of the territorial community population is based on the personal value of each active community member and the high probability of their voice being taken into account in the decision-making process of local authorities; on their personal potential for usefulness in terms of providing resources, responsibility for the results of joint activities and full awareness as a result of communications in social networks.

Figure 1. Algorithm for the development of social capital of a territorial community
Source: compiled by the authors on the basis of material by S.A. Haiduchenko (2022)

Everything discussed above gives grounds for identifying the following key areas of state policy on the development of social capital of territorial communities in the process of their development (Haiduchenko, 2022):

- improving legislation to ensure the actual participation of citizens in the management of local affairs;
- development and implementation of state training Programmes for civic leaders and local government officials on the development of territorial communities in the context of successful European experience;
- creation of platforms at the state level for discussing problematic issues and experience in solving them, as well as coordination of joint Programmes and projects between different territorial communities;
- continuous improvement of the system of monitoring and evaluation of the development of territorial communities and their social capital;
- continuous improvement of legislation and state policy on systemic support for the formation of civil society.

The final direction of the state policy on systemic support for the formation of civil society in Ukraine from the standpoint of the development of social capital of territorial communities is quite complex, time-consuming and controversial due to the objective need to form the population's value orientations in accordance with the challenges of the coming information civilization and taking into account the historical features of the system of spiritual values inherent in the Ukrainian people.

The peculiarities of social capital formation in the context of martial law in the country, which carry the risks of destabilizing war pressure and a significant reduction in the capacity of the public administration system to provide constitutional guarantees to society, are also the subject of professional discussion. In this case, the determining factor is the strengthening of the social capital of territorial communities in terms of consolidating their population around the goal of ensuring not only the territorial integrity of Ukraine, but also the final identification of its population with the national idea of unity in all spheres of life based on the historical experience of the struggle for independence, including territorial values in a situation of threat to life (Mykhailichenko *et al*., 2024).

In particular, experts consider forecasts of the transformation of the social capital of territorial communities under optimistic, pessimistic and realistic scenarios of the development of military operations (Dyakonenko, 2023). The optimistic scenario provides for a positive impact on the development of the social capital of territorial communities through the stabilization of their livelihoods and the increase in their financial capacity, which will strengthen the sense of social protection among the population of communities and reduce economic anxiety. Therefore, it is only natural that volunteerism, charity, trust in military authorities and leaders, community cohesion, entrepreneurship, repair of damaged housing, infrastructure and production facilities, citizen participation in solving problematic issues of community life will increase.

The pessimistic scenario of military operations does not exclude their "freezing" within the currently occupied territories, which could ensure that the occupiers prepare for a repeated large-scale massive offensive and the seizure of new territories. Under such conditions, the transformation of the social capital of territorial communities may be affected by a decrease in the level of trust in the authorities and neighbours, as well as the activity of the progressive public. In addition to such opposing options for the development of hostilities, we should expect a more realistic option for the complete liberation of Ukrainian territories from the occupiers in 2023-2024. This option will contribute to the revival of Ukraine, restoration of the damaged housing stock and infrastructure, as well as the construction of new housing and infrastructure facilities before and during the return of the evacuated population to their places of permanent residence.

In these circumstances, researchers predict "significant positive changes in the social capital of territorial communities with a unifying effect, which will manifest itself in a reduction in social conflicts and tensions; increased trust among the population and assistance to war-affected residents; prevention of looting" (Dyakonenko, 2023). Characteristically, such manifestations dominate mainly within the community and, to a lesser extent, outside it, as proven by theoretical and statistical studies. In particular, medical scientists attest to the fact that a substance is generated in the human body under the threat of death, which "makes a person identify with his or her community and community values" (Bauer *et al.,* 2012), and sociological researchers point to statistics during the war in Nepal that "demonstrate greater in-group social capital and less out-group social capital" (Gilligan *et al.,* 2014). However, they will continue to feel the effects of the war for a long time to come in the context of lower levels of trust and happiness; fear of losing their families and homes; and a biased and even hostile attitude towards citizens of the aggressor country who support the war. The latter factor in this psychological state of Ukrainians is substantiated by the results of a survey conducted by the Rating Sociological Group, as of October 2022, 81% of the Ukrainian population had a "cold" attitude towards Russians, and 93% had a "definitely hostile" attitude (excluding residents of the temporarily occupied territories).

The most problematic factor that hinders the development of civil society and its unifying social capital in such territories may be the unwillingness of some pro-Russian community residents who remained under occupation and were influenced by anti-Ukrainian propaganda to cooperate with the Ukrainian authorities (Sokolska *et al.,* 2021). The most publicly discussed issue of exposing such propaganda should be a fairly broad set of its mechanisms, namely:

- distortion and substitution of facts;
- Russian language as an open hostility;
- provoking emotional perception of information;
- public support for pro-Russian managers in all spheres of life, political figures, public, political and religious organizations (Libanova *et al.,* 2022).

A specific problematic issue for the Security Service of Ukraine and the Ministry of Internal Affairs of Ukraine is ensuring national security in the face of rejection of national values of life after the liberation of their community by persons liable for military service and employees of law enforcement agencies. They are likely to take a passive stance of rejection or, on the contrary, provoke processes in the community that destabilize its life (Aghajanian, 2016). The most realistic scenario of hostilities in Ukraine is that the population of territorial communities in the border areas and close to the line of contact with the enemy will suffer from the constant threat of an aggressor's offensive and its regular shelling, as they serve as the first line of logistical support for the Armed Forces of Ukraine. In such circumstances, it is extremely important for the development of the social capital of this group of communities to establish its social ties and relations with all institutions of civil society and public administration; a high level of trust in the charitable and volunteer movement, clearly coordinated with the activities of executive authorities in the context of partnership cooperation; increasing the level of mutual assistance and assistance to community residents who have lost their homes, loved ones, and financial sources of livelihood (Spytska, 2024).

This was confirmed by experts who identified Kharkiv, Dnipro, Odesa as the most active regions, with a high level of civic engagement in supporting the life and assistance to

the Armed Forces of Ukraine, although at the same time, in Mykolaiv, Kherson, Sumy, Chernihiv regions, the social movement was weak and ineffective due to high risks to life and the overwhelming trust of community residents in informal non-governmental organizations in joint actions to help the army and victims in the war. Therefore, it is quite likely that in these areas in the post-war period, there may be a rather low probability of building the necessary level of social potential due to factors such as insufficient coherence of interaction between the population and its significant social stratification; high migration risks (low financial security, educational indicators of citizens, the number of young residents) (Dyakonenko, 2023).

In the most realistic scenario, in wartime and post-war times, in the territorial communities of Ukraine, which are called the deep rear, due to their considerable distance from the combat zone, the trends in the formation of social capital are determined by the scale of refugee reception and business activity, as well as the ability of the authorities to effectively manage these processes. Where the conditions for business relocation are favourable, the community effectively uses its positive social potential, which can deter people from returning to their places of permanent residence. Conversely, under unfavourable conditions, there may be an outflow of highly skilled human resources and social capital to neighbouring European countries, but those who remain will seek to invest in these areas and cooperate with local authorities and self-governing organizations to further improve their living conditions. As a result, such territorial communities will have a significant increase in social capital and all the conditions for further development (Law of Ukraine No. 280/97, 1997).

But it is quite natural that the most desirable scenario is an optimistic one, when the hostilities end with the victory of the Armed Forces of Ukraine in the struggle to liberate its territories from the occupiers. Accordingly, it can be expected that in the post-war period, the authorities will be able to ensure the restoration of decent living conditions for the population of territorial communities, especially those most affected by the war (Shtal *et al.,* 2019). The pace of refugees' return to their places of permanent residence will depend on this, mainly due to the extent of damage to housing, infrastructure and production facilities, the level of state resource provision to communities and the intensity of recovery processes. Added to this are well-established social networks of communication between territorial communities, which will facilitate partnerships and assistance with wealthier and more successful neighbouring communities. All of this together will only contribute to the growth of positive social capital in Ukraine's territorial communities.

A pessimistic scenario of hostilities in Ukraine is completely unacceptable, as it could lead to a delay in the end of the war with all the negative consequences that threatens to further reduce the population of communities and, as a result, the level of their social capital. The main factors are the growth of migration due to the low capacity of the state to protect the population and its decent living standards; the spread of bribery, corruption, unemployment, and shadow employment, which together contribute to the development of social capital in territorial communities with negative characteristics. Therefore, the challenge of our time and the subject of discussions in governmental structures, as well as discussions among the progressive public, is to intensify Ukraine's international policy in order to obtain comprehensive assistance, which is essential for a speedy victorious end to the war in the context of establishing its sovereignty and security of its European neighbours, as well as guarantees of Ukraine's security in the post-war period. In addition to this, the actual regulation by the public administration system of the development of social capital of territorial communities should be added.

Discussion

The problem of the development of social capital of territorial communities is actively studied not only by Ukrainian researchers, but is also widespread in foreign scientific doctrine. The direct impact of social capital on entrepreneurial outcomes is clearly demonstrated in a number of case studies from Ukrainian territorial communities. To illustrate, in the Lviv region, the advancement of robust community networks has resulted in the establishment of new small businesses, even amidst the prevailing conflict. The aforementioned entrepreneurs have benefited from the trust and cooperation within their communities, which has facilitated access to financial resources, shared business knowledge and fostered local consumer loyalty. These networks have been instrumental in surmounting the obstacles posed by the war, particularly in regions with a considerable displaced population.

Accordingly, scientists analyse the conditions for the implementation of this process, as well as the factors affecting its effectiveness. In particular, M. Rezaei *et al.* (2020) believed that a high-quality institutional foundation plays an important role in the process of social capital development. It should be noted that this condition was also noted in the results of this study. They established that the state, as well as local authorities, should ensure this process, both by stimulating interaction between community representatives and by forming external relations. This is common between both studies, which emphasized the priority of preserving social infrastructure in rural territorial communities, such as post offices, railway stations, bank branches. The researchers believed that an effective approach is the development of state programs aimed at involving local stakeholders in the improvement of territorial communities. As a result of this, local action groups are formed, which correspond to the development and implementation of various development strategies. This approach was also mentioned in the results of this study. In this case, both works share a description of the principles on the basis of which programs for the development of the social capital of territorial communities should be developed. Among them, a local approach; interaction; vertical relations "bottom up"; involvement of community members in management; innovativeness;

cooperation. In addition, there is a common conclusion about the structure of such programs, which should consist of local action groups; effective development strategies; specifically, defined areas of application of the program.

Community networks have been instrumental in assisting displaced populations in the reconstruction of their lives, offering both emotional and practical assistance. In regions such as Ivano-Frankivsk and Khmelnytsky, where local networks have been particularly robust, communities have collaborated to create opportunities for displaced entrepreneurs. These include the provision of resources such as temporary workspaces, access to local markets and financial support through community-driven crowdfunding initiatives. Such a collective response serves not only to mitigate the economic impact of displacement but also to reinforce the social fabric of these regions, thereby facilitating a more rapid recovery from the economic disruptions caused by the war (Berdar *et al.,* 2024).

During the study of the specifics of the development of the social capital of territorial communities, special attention should be paid to the risks arising in this process. This position is taken by I. Saz-Gil *et al.* (2021), who's in their work highlighted various problems that arise during the formation and provision of social capital. This study also emphasized the priority of studying risks and emphasized the expediency of overcoming them. First of all, the researchers revealed the problem of social exclusion of community representatives who do not agree to accept local social norms. In addition, they singled out the risk of developing xenophobia, as well as intolerance to the new in society. Thus, the work has in common the identification of the uneven involvement of different social groups as an important problem that negatively affects the development of social capital. Based on this, it can be noted that the main advantage of the effective implementation of this process is the opportunity to ensure the development of informal relationships between representatives of various social groups, as well as members of the territorial community. The common conclusion is that the development of social capital allows revealing the mental characteristics of citizens, peculiarities in their behaviour and approaches to community management. It is imperative to recognise the pivotal role of social capital in post-war recovery. Communities with higher levels of trust and cooperation, as evidenced in the western regions of Ukraine, have demonstrated resilience in the face of economic challenges brought on by the conflict. The capacity of these communities to mobilise resources and provide support for entrepreneurial activities serves to illustrate the pivotal role that social capital plays in fostering long-term economic stability. In contrast, regions exhibiting diminished social capital, such as those situated in proximity to conflict zones, have encountered significant challenges in their economic recovery. This underscores the imperative for targeted initiatives aimed at restoring social cohesion and trust in these regions.

The analysis and selection of approaches to increase the efficiency of the social capital development process in various territorial communities presupposes a primary study of social values, as well as social norms. According to R. Musavengane & R. Kloppers (2020), this stage is mandatory during the formation of programs to ensure the above-mentioned process. This approach coincides with what was revealed in this study, as it allows to determine the conditions under which the development of social capital occurs in specific territorial communities. First of all, the researchers emphasized the priority of the family and the closest social environment for representatives of different communities. In addition, he pointed to the low degree of involvement of citizens in public life, in particular outside the boundaries of their own family. Common between the works is the identification of such a condition as the average level of social trust. In this case, the level of trust manifested in different subjects was investigated, and it was also established that the greatest trust is in the members of one's family. The researchers also emphasized the close connection of community members with their neighbours, which positively affects the development of the social capital of territorial communities. The common conclusion is that a high level of trust is also reflected in the relations of citizens with religious organizations. Accordingly, the disclosed relationships reflect the specifics of the development and consolidation of social capital in various territorial communities.

One of the components of the qualitative process of social capital development is the interaction between community members and the authorities (Hysi *et al*., 2024). This issue was analysed in his research by W. Mandrysz (2020), who established that it is advisable to consider the involvement of residents as a two-way process, which involves both taking into account their interests during the selection of approaches to the development of the territory, and their activation. This was also mentioned in this study, namely, the specifics of the implementation of measures aimed at involving community members in its development were described. What is common between the works is the identification of the principles based on which the implementation of this process should take place. Among them, goal setting; participation limits; equal access; tolerance; as well as feedback. At the same time, the researcher also paid attention to promising methods for involving local self-government bodies of community members in joint management activities. He singled out the method of informing as one that involves providing citizens with access to up-to-date and objective information, which leads to conveying to the public the essence of a social problem. Such an approach was also mentioned within the framework of this study; accordingly, it was emphasized that informing all layers of the territorial community contributes to increasing their awareness in the sphere of public life. Common among the studies is the conclusion that informing citizens about the state of development of social capital can be carried out using various communication channels, in particular official websites, blogs, and social networks.

F. Chen *et al.* (2023) also paid attention to ways of increasing the effectiveness of cooperation of community

members with local self-government bodies, while revealing the essence of the method of consultation and interaction. They established that the consultation process should provide management bodies with the opportunity to receive feedback from citizens regarding a specific problem in the community. This study also analysed various forms of consulting community members in the process of developing social capital. The researchers indicated that an effective approach to the implementation of counselling is the diversification of interaction methods. For example, they suggested organizing long-term consultations for those subjects who show the greatest interest in the relevant public issue. Within this work, various consulting methods were also revealed, including surveys, public hearings, community-based educational programs and advisory groups. Thus, the conclusion about the expediency of organizing the interaction of local self-government bodies with citizens through consultations is common among the studies. The works described the advantages of this approach and determined its impact on the dynamics of social capital development.

M. Igalla *et al.* (2020) revealed them in their research, in particular, they pointed to the development and consolidation of stable relationships between local authorities, residents, as well as other interested entities in the community. Within the framework of this study, it was also emphasized that the development of social capital provokes an increase in the self-government body's awareness of the needs, interests, and wishes of various members of the community, as well as representatives of social groups. Accordingly, the common position is that with the help of strengthening ties between different parts of the community, the legitimacy of local authorities is increased, and the level of non-acceptance of various management decisions by citizens' decreases.

Based on the above, it can be established that the positions of various researchers regarding the organization of qualitative interaction between the community and the governing bodies coincide. This is explained by the fact that this indicator affects not only the development of individual social groups, but also the community as a whole. Taking this into account, it is worth noting that the successful development of the social capital of the territorial community is impossible without ensuring effective cooperation and the development of trusting relations between its various parties.

Conclusions

The advancement of social capital within territorial communities is of paramount importance for the stimulation of local economic recovery and entrepreneurial success, particularly in light of the challenges currently facing Ukraine. Social capital, defined as the networks of relationships, trust, and norms within communities, provides the foundation for individuals and groups to collaborate toward shared goals. This collective endeavour, based on mutual trust, serves as the bedrock for local economic resilience. It can be observed that communities with robust social capital are better positioned to withstand economic disruptions resulting from conflict and displacement. They are better equipped to rebuild and encourage entrepreneurship by leveraging these connections. The experience of countries that have achieved successful outcomes demonstrates that social capital with positive features should be a principal instrument in the management of local development. The presence of social capital has been demonstrated to have a positive impact on economic outcomes, as well as on the quality of community governance and the level of civic participation. The principles of shared interest in solving common problems, transparency, and diverse forms of public participation create an environment in which community members contribute to social and economic initiatives, thereby driving local development.

The research findings in Ukraine reveal considerable regional disparities in social capital, which exert a pronounced influence on economic outcomes. For instance, in localities with robust social networks, such as those in Lviv and Vinnytsia, regional economic growth has been more pronounced, with elevated rates of job creation and entrepreneurial activity. These regions have utilised their social capital to attract investment, provide support for small and medium-sized enterprises, and foster civic engagement, which serves to enhance economic resilience. In contrast, regions such as Donetsk and Luhansk, which have experienced the erosion of social capital as a consequence of armed conflict and population displacement, are confronted with more significant obstacles in the reconstruction of their social structures and economies. In these regions, the weakening of social networks and a lack of trust have constituted significant obstacles to recovery, thereby limiting opportunities for entrepreneurship and economic growth. This contrast serves to illustrate the pivotal role that social capital plays in determining the resilience of territorial communities.

The prospective evolution of social capital in Ukraine is contingent upon the capacity of the state to guarantee security and provide conducive living conditions, thereby facilitating the reconstruction of more robust networks and the enhancement of trust among residents. In an optimistic scenario, state support for community initiatives, in conjunction with the restoration of infrastructure, will result in favourable outcomes for the development of social capital, thereby creating an environment conducive to entrepreneurship and local growth. Nevertheless, should the deterioration of social capital persist due to the prolongation of conflict, communities may encounter difficulties in their economic recovery. A weakening of social bonds may result in an increase in migration, unemployment and a reduction in civic engagement, which could further impede local recovery efforts. It is therefore recommended that policies aimed at rebuilding social capital should prioritise the restoration of trust, access to resources and inclusive civic participation in the context of post-war recovery.

Social capital will undoubtedly be a pivotal factor in Ukraine's post-war recovery. The restoration of robust social networks and the fostering of trust will facilitate the restoration of livelihoods, the creation of new

enterprises, and the promotion of long-term economic growth. It is imperative that further research be conducted into the rebuilding of social capital in areas affected by war, in order to ensure the success of Ukraine's recovery and its future stability.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Aghajanian, A.J. (2016). *Social capital and conflict: Impact and implications*. Brighton: University of Sussex.
[2] Bauer, M., Cassar, A., Chytilová, J., & Henrich, J. (2012). *Warfare experience during ontogeny increases egalitarian and parochial motivations*. Maastricht: University of Maastricht.
[3] Berdar, M., Kot, L., Martyniuk, L., Yevtushevska, O., & Sapachuk, Yu. (2024). Challenges and prospects of innovation and investment development of enterprises in the post-war period. *Economics of Development*, 23(2), 27-37. doi: 10.57111/econ/2.2024.27.
[4] Chen, F., Yi, Y., & Zhao, Y. (2023). The effect of social capital at the community and individual levels on farmers' participation in the rural public goods provision. *Agriculture*, 13(6), article number 1247. doi: 10.3390/agriculture13061247.
[5] Chernega, I.I., Kostyuk, V.S., Revutska, A.O., & Parkhomenko, L.A. (2023). Social development of territorial communities: Features of the war and post-war periods. *Science and Technology Today*, 10(24), 156-168. doi: 10.52058/2786-6025-2023-10(24)-156-168.
[6] Dobroskok, I., Basiuk, L., Rzhevska, N., & Kalashnyk, M. (2019). Reclaiming and reframing economics: Probing the educational potential. *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu*, 2019(3), 172-177. doi: 10.29202/nvngu/2019-3/20.
[7] Dyakonenko, O. (2023). Social capital of the territorial communities of Ukraine in the conditions of war: current transformations and forecasted changes. *Demography and Social Economy*, 52(2), 54-71. doi: 10.15407/dse2023.02.054.
[8] Eighteenth national survey: Attitude of Ukrainians towards foreign countries. (2022). Retrieved from https://ratinggroup.ua/files/ratinggroup/reg_files/rg_ua_1000_international_102022_xviii_press.pdf.
[9] Gavkalova, N., & Kyrychenko, Yu. (2023). Scientific-theoretical basis of the territorial development strategy. *Economics of Development*, 22(1), 31-37. doi: 10.57111/econ/1.2023.31.
[10] Gilligan, M.J., Pasquale, B.J., & Samii, C. (2014). Civil war and social cohesion: Lab-in-the-field evidence from Nepal. *American Journal of Political Science*, 58(3), 604-619. doi: 10.1111/ajps.12067.
[11] Haiduchenko, S.A. (2022). Potential development management of rural territories of Ukraine in unfinished conditions decentralization reforms. *Expert: Paradigm of Law and Public Administration*, 1(19), 91-102. doi: 10.32689/2617-9660-2022-1(19)-91-102.
[12] Hysi, A., Avdulaj, J., Shahini, E., Goga, I., & Shahini, E. (2024). Role of legal regulation in the establishment and development of the public administration system with local self-government aspects. *Social and Legal Studios*, 7(1), 27-36. doi: 10.32518/sals1.2024.27.
[13] Igalla, M., Edelenbos, J., & van Meerkerk, I. (2020). What explains the performance of community-based initiatives? Testing the impact of leadership, social capital, organizational capacity, and government support. *Public Management Review*, 22(4), 602-632. doi: 10.1080/14719037.2019.1604796.
[14] Law of Ukraine No. 280/97 "On Local Self-Government". (1997, May). Retrieved from https://zakon.rada.gov.ua/laws/show/280/97-%D0%B2%D1%80#Text.
[15] Lesechko, M., & Sydorchuk, O. (2008). The value of social capital in the organization of local self-government. *Bulletin of the Central Election Commission*, 2(12), 58-64.
[16] Libanova, E.M., Pozniak, O.V., & Tsymbal, O.I. (2022). Scale and consequences of forced migration of the population of Ukraine as a result of armed aggression of the Russian Federation. *Demography and Social Economy*, 2(48), 37-57. doi: 10.15407/dse2022.02.037.
[17] Mandrysz, W. (2020). Community-based social economy-social capital and civic participation in social entrepreneurship and community development. *Management Dynamics in the Knowledge Economy,* 8(1), 81-93. doi: 10.2478/mdke-2020-0006.
[18] Musavengane, R., & Kloppers, R. (2020). Social capital: An investment towards community resilience in the collaborative natural resources management of community-based tourism schemes. *Tourism Management Perspectives*, 34, article number 100654. doi: 10.1016/j.tmp.2020.100654.
[19] Mykhailichenko, L., Dashko, I., & Cherep, O. (2024). Features of the youth labour market after the invasion of russia in Ukraine and ways to improve the youth labour force in the post-war period. *Innovation and Sustainability*, 4(3), 27-33. doi: 10.31649/ins.2024.3.27.33.
[20] Onishchenko, V.P. (2023). Human and social capital of Ukraine in the period of its post-war recovery. *Economy of Ukraine*, 1, 3-19. doi: 10.15407/economyukr.2023.01.003.

[21] Revko, A. (2019). Social capital as a catalyst for the development of social infrastructure of the region's socio-humanitarian space. *Eastern Europe: Economics, Business and Management*, 4(21), 400-405.
[22] Rezaei, M., Jafari-Sadeghi, V., & Bresciani, S. (2020). What drives the process of knowledge management in a cross-cultural setting: The impact of social capital. *European Business Review,* 32(3), 485-511. doi: 10.1108/EBR-06-2019-0127.
[23] Saz-Gil, I., Bretos, I., & Díaz-Foncea, M. (2021). Cooperatives and social capital: A narrative literature review and directions for future research. *Sustainability*, 13(2), article number 534. doi: 10.3390/su13020534.
[24] Shevchenko, B., & Lyulka, G. (2023). Social capital in the development of territorial communities. In *Collection of scientific papers of teachers, postgraduate students, master's and students of the faculty of computer science, mathematics, physics and economics* (pp. 207-209). Poltava: Poltava V.G. Korolenko National Pedagogical University.
[25] Shtal, T.V., Polyakova, Y.O., Proskurnina, N.V., Dobroskok, I.B., & Kot, O.V. (2019). Modeling of convergence of the economic system of Ukraine with G20 countries based on the analysis of structural changes in Ukrainian foreign trade. *Journal of Advanced Research in Law and Economics*, 9(6), 2129-2145. doi: 10.14505//jarle.v9.6(36).28.
[26] Sokil, O., Zvezdov, D., Zhuk, V., Kucherkova, S., & Sakhno, L. (2020). Social and environmental costs: The impact of accounting and analytical support on enterprises' sustainable development in Germany and Ukraine. *Economic Annals-XXI*, 181(1-2), 124-136. doi: 10.21003/ea.V181-11.
[27] Sokolska, T., Dzhegur, G., Polishchuk, S., & Lobachova, S. (2021). The importance of human capital in the formation of capable united territorial communities of Ukraine. *Aspects of Public Administration*, 9(5), 36-46. doi: 10.15421/152146.
[28] Spytska, L. (2024). Forecasts regarding mental disorders in people in the post-war period. *European Journal of Trauma and Dissociation*, 8(1), article number 100378. doi: 10.1016/j.ejtd.2024.100378.
[29] Suslov, M. (2023). Features of the development of the local identity of the utc in the conditions of war in Ukraine. *Public Administration and Regional Development*, 19, 177-198. doi: 10.34132/pard2023.19.09.
[30] Yermakova, O.A. (2016). Social capital as an important factor in the economic development of Ukraine and its regions. *Bulletin of the Lviv Polytechnic National University. Series: Problems of Economics and Management*, 847(4), 88-96.
[31] Zaiats, T., & Kraievska, H. (2020). Social capital development of territorial communities in Ukraine. *Economy of Ukraine*, 12, 56-72. doi: 10.15407/economyukr.2020.12.056.
[32] Zvonar, V., Dyakonenko, O., & Sova, O. (2022). Regularities of social capital formation in Ukraine: Theoretical framework and international context. *Demography and Social Economy*, 49(3), 102-122. doi: 10.15407/dse2022.03.102.

Особливості розвитку соціального капіталу територіальних громад в сучасній Україні

Світлана Гайдученко

Доктор наук з державного управління, професор
Харківський національний університет міського господарства імені О.М. Бекетова
61002, вул. Чорноглазівська, 17, м. Харків, Україна
https://orcid.org/0000-0003-3173-4763

Христина Калашнікова

Кандидат економічних наук, доцент
Харківський національний університет міського господарства імені О.М. Бекетова
61002, вул. Чорноглазівська, 17, м. Харків, Україна
https://orcid.org/0000-0002-9190-6187

Людмила Набока

Кандидат наук з державного управління
Харківський національний університет імені В.Н. Каразіна
61022, Майдан Свободи, 4, м. Харків, Україна
https://orcid.org/0000-0001-8719-823X

Олена Коротич

Доктор наук з державного управління, професор
Харківський національний університет імені В.Н. Каразіна
61022, Майдан Свободи, 4, м. Харків, Україна
https://orcid.org/0000-0002-2572-5601

Олег Дєгтяр

Доктор наук з державного управління, професор
Національний університет оборони України
03049, просп. Повітряних Сил, 28, м. Київ, Україна
https://orcid.org/0000-0001-6413-3580

Анотація. Актуальність дослідження зумовлена необхідністю вивчення впливу розвитку соціального капіталу в територіальних громадах України на місцеве економічне зростання та підприємницьку активність, особливо в умовах післявоєнної відбудови. Метою цієї статті є дослідження впливу розвитку соціального капіталу територіальних громад в Україні на місцеве економічне зростання та підприємницьку активність. Для цього в статті представлено низку тематичних досліджень, проведених у різних регіонах. У дослідженні використано методи системно-діалектичного аналізу, формально-логічний, синтезу, узагальнення, індукції, дедукції, прогнозування. У результаті було узагальнено сутність категорії "соціальний капітал територіальної громади", розкрито основні теоретичні та практичні аспекти розвитку такого капіталу громади. В результаті було встановлено, що теоретичні засади розвитку соціального капіталу територіальних громад здебільшого орієнтовані на їх системне та комплексне використання в режимі безперервного вдосконалення в умовах воєнного та післявоєнного стану України. Також в ході дослідження визначено принципи життєдіяльності територіальної громади з відповідним рівнем соціального капіталу, який домінує в межах громади та визначає ідентифікацію мешканців з громадою та її цінностями у відкритому та вільному суспільстві, особливо в ситуаціях, що загрожують життю. Отримані в статті результати доцільно використовувати для розробки програм розвитку соціального капіталу територіальних громад під час воєнних дій в Україні та у післявоєнний період

Ключові слова: державне управління; місцеве самоврядування; соціальні норми і цінності; соціальні мережі; сценарії розвитку

Scientific Bulletin
of Mukachevo State University

Series
Economics

Volume 11, No. 4, 52-67
Journal homepage: https://economics-msu.com.ua/en

UDC 351.86:331.108.2
DOI: 10.52566/msu-econ4.2024.52

Personnel policy and defence economics: The relationship between efficiency and costs in the armed forces

Oleh Semenenko*
Doctor of Military Sciences, Professor
Central Research Institute of the Armed Forces of Ukraine
03049, 28B Povitrianykh Syl Ave., Kyiv, Ukraine
https://orcid.org/0000-0001-6477-3414

Yurii Kliat
PhD in Technical Sciences, Associate Professor
Central Research Institute of the Armed Forces of Ukraine
03049, 28B Povitrianykh Syl Ave., Kyiv, Ukraine
https://orcid.org/0000-0002-8267-3748

Viktor Tsarynnyk
Chief of the Personnel Management and Mobilization Research Section
Central Research Institute of the Armed Forces of Ukraine
03049, 28B Povitrianykh Syl Ave., Kyiv, Ukraine
https://orcid.org/0009-0003-8638-6353

Maria Yarmolchyk
Doctor of Philosophy, Associate Professor
National Aviation University
03058, 1 Liubomyr Huzar Ave., Kyiv, Ukraine
https://orcid.org/0000-0001-9917-0189

Robert Ovanesian
Leading Researcher
Central Research Institute of the Armed Forces of Ukraine
03049, 28B Povitrianykh Syl Ave., Kyiv, Ukraine
https://orcid.org/0009-0008-6761-2059

Received: 26.07.2024, Revised: 30.10.2024, Accepted: 27.12.2024

Suggested Citation: Semenenko, O., Kliat, Yu., Tsarynnyk, V., Yarmolchyk, M., & Ovanesian, R. (2024). Personnel policy and defence economics: The relationship between efficiency and costs in the armed forces. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 52-67. doi: 10.52566/msu-econ4.2024.52.

*Corresponding author

Abstract. The purpose of this study was to examine the impact of human resources policy on the economic efficiency of the armed forces, with a focus on cost optimisation and combat readiness. The study analysed human resource management models, including contract recruitment, long-term workforce planning, short-term training programmes and rotation, and their impact on economic performance in the armed forces of countries such as the United States, the United Kingdom, Germany, Sweden, Canada, Australia, Israel, France, Italy, Spain, India, Romania, Pakistan, Norway, and Ukraine. Furthermore, a comparative analysis of the defence sector of these countries was conducted, with a special focus on the personnel policy of the Ukrainian defence sector. The study also conducted a SWOT-analysis of these models, which helped to assess their strengths and weaknesses, opportunities and threats to the economic efficiency of the defence sector. Specifically, contract recruitment provides flexibility in staffing levels but can lead to low staff loyalty, while long-term workforce planning promotes stability but requires significant investment. The findings showed that effective career planning, exacting standards of recruitment, regular training, and social support are key factors that contribute to cost optimisation and staff stability. Furthermore, the integration of technological training improves resource efficiency and reduces maintenance costs. The SWOT analysis demonstrated that a hybrid model that combines elements of different approaches ensures adaptability in crisis situations but requires careful management due to the heterogeneity of the workforce. Based on the findings, the study offered recommendations for optimising human resources policy to increase the cost-effectiveness of the armed forces, particularly through flexible recruitment programmes, the use of civilian specialists for non-critical positions, and the integration of reservists to perform support tasks in crisis conditions, with a detailed analysis of their implementation in the Ukrainian defence sector. The findings confirm that a balanced human resources policy allows maintaining combat readiness while reducing overall defence sector costs

Keywords: military resources; national security; personnel management in the army; security sector; army financing

Introduction

Changes in the global security environment, driven by intensifying geopolitical conflicts, rising military budgets, and technological advancement, make the defence sector a critical element of national security. Therewith, governments are increasingly faced with the need to manage resources efficiently to ensure that their armed forces are as effective as possible within limited financial means. The issue of optimum personnel policy has become one of the central aspects of the economic efficiency of military structures.

Integrating the principles of economic management into the personnel policy of the armed forces allows striking a balance between costs and the effectiveness of military operations. At the same time, considering the unique needs of the defence sector, the study of mechanisms that contribute to both cost reduction and efficiency improvement becomes necessary for the development of modern defence management strategies.

Human resources policy and economic management are vital elements that influence the functionality and effectiveness of the armed forces (Gavrysh *et al*., 2024). With limited resources, effective personnel management is crucial for maintaining defence capabilities.

D. Clarke (2021) emphasised the significance of civil-military relations and their effect on personnel decisions in the defence sector. The researcher noted that coordination between civilian and military leaders contributes to the optimum allocation of resources, especially in recruitment and training. This ensures a more stable and predictable personnel policy in the face of uncertainty. N. Malik (2024) explored the political economy of the defence sector in the case of Pakistan. The researcher highlighted the role of a strategic approach to education and training of military personnel, which affects the optimisation of costs in the sector. N. Malik emphasised that priority funding of military educational institutions can reduce the cost of supplementary education and training.

J.M. Ortiz-Villajos & J.J. Martos-Gómez (2023) analysed the modernisation of the Spanish armed forces, focusing on the economic aspects of defence. Their study found that careful financial management in the defence sector, including investments in human resources, is a key factor in increasing efficiency and reducing costs. The researchers noted that effective modernisation involves not only improving technical performance but also optimising human resources costs, which is a prominent aspect of the overall strategy.

Current research in the field of human resources policy and defence economics is actively exploring the issue of optimising costs and increasing the efficiency of the armed forces through improved human resources management. Within the framework of this review, it is important to focus on the various approaches and findings obtained by researchers.

A. Calcara & L. Simón (2024) analysed the cooperation between France and Germany in the context of the development of the European defence industry. They emphasised the significance of collective efforts in the defence sector to achieve economic efficiency, specifically through the coordination of human resources policies and cost rationalisation. T. Dyson & Y. Pashchuk (2022) examined the learning and adaptation process of the Ukrainian Armed Forces during the conflict in Donbas, focusing on the implementation of feedback processes and 'lessons learned'. Their study showed that systemising human resources processes can increase efficiency and reduce resource losses in a protracted conflict.

M. Domínguez *et al*. (2023) assessed productivity changes in North Atlantic Treaty Organization (NATO)

countries with a focus on the impact of economic performance on the defence sector. The researchers concluded that the productive use of resources, specifically through workforce planning, positively affects defence capability by minimising costs. P.Y. Lindgren & A. Ofstad Presterud (2021) examined unemployment and recruitment in the Norwegian armed forces, highlighting the economic benefits of recruitment during periods of high unemployment. Their study showed a strong correlation between the labour market and personnel policy, which affects cost optimisation in military structures.

Despite considerable interest in the issue of effective management of defence resources, some aspects, such as the relationship between costs and human resources policy, are still understudied. Existing studies, such as those by F. Coticchia & F.N. Moro (2023), focused on the problems of adapting armed forces to modern conflicts, but lacked a detailed analysis of the impact of human resources policy on cost reduction. M.H. Danley (2023) raised the issue of resource availability for military structures, but did not provide a clear understanding of how cost-effective human resources management can improve the financial performance of the defence sector.

The purpose of this study was to identify effective approaches to human resources policy that contribute to cost optimisation and efficiency in the armed forces. The study sought to identify the links between human resources management and cost-effectiveness in the defence sector, as well as to analyse concrete human resources strategies that can reduce costs without compromising defence capabilities. The tasks of the study were as follows:

- to identify the key factors that influence the effectiveness of personnel policy and cost optimisation;
- to analyse the models of personnel management in the armed forces of different countries to assess their cost-effectiveness;
- to establish the relationship between economic efficiency and personnel policy in the armed forces;
- to develop recommendations for the implementation of human resources strategies to reduce costs without losing combat capability.

Materials and Methods

The study of human resources policy and economic efficiency of the armed forces was based on the analysis of academic sources, strategic reports of defence ministries, and statistics from national and international resources. The study covered the defence structures of various countries, including NATO member states, the EU, and other states with developed defence systems – the United States, the United Kingdom, Germany, Sweden, Canada, Australia, Israel, France, Italy, Spain, India, Romania, Pakistan, Norway, and Ukraine.

The primary sources of information included analytical reports of the Ministry of Defence of the United Kingdom (2024), which cover issues of economic efficiency and human resources policy. Other valuable sources were the analytical materials of the Department of Defence of the United States (2024), covering defence resource management and the specifics of human resources policy in the armed forces, as well as the strategic review of Australia's defence policy, which highlights its specifics in the field of human resources management (Australia's 2023 defence…, 2023). The study also considered the strategic commentary on the reform of India's defence system, which highlighted changes in personnel policy and resource management (India's defence transformation, 2022).

The key research methods used were content analysis, comparative analysis, and SWOT analysis. Content analysis was used for a systematic review of scientific sources and strategic documents, which helped to identify key human resources factors that affect the economic efficiency of the armed forces. This method provided a structured approach to exploring various aspects of human resources policy, including professional selection, training, social support, and technological support. The comparative analysis helped to evaluate different models of human resources management in the armed forces of different countries, comparing their economic benefits, as well as their impact on combat readiness and operational sustainability.

A SWOT analysis was used to comprehensively assess the human resource management models. This method helped to identify the strengths, weaknesses, opportunities and threats to each model of human resources policy. The SWOT analysis was particularly useful in identifying the advantages and disadvantages of approaches such as contract recruitment, long-term planning, short-term training programmes, intensive training rotation, and hybrid models. The SWOT analysis helped to assess which human resources policy models are best suited to strike a balance between cost-effectiveness and readiness.

This analysis formed the basis for the development of recommendations for optimising human resources policy in the armed forces. Through a systematic review of scientific sources and strategic documents, content analysis helped to identify key human resources factors that affect economic efficiency and combat readiness. A comparative analysis of human resource management models in various countries helped to assess their economic feasibility and effectiveness in specific contexts.-

To ensure the reliability of the data, the study used standardised cost and combat capability indicators recommended by international analytical institutions such as the Stockholm International Peace Research Institute (2024) and the European Defence Agency (2024), which offer unified approaches to assessing the effectiveness of defence structures.

Results

The effectiveness of human resources policies in the armed forces significantly affects the overall economic sustainability of the defence sector. Careful planning, recruitment, training programmes, and social support are crucial for optimising personnel costs and maintaining combat capability. A content analysis of current research and strategic reports from defence ministries in various countries

revealed a series of key factors that influence the effectiveness of human resources policy.

Effective career planning contributes not only to staff motivation, but also to staff stability, reducing the need for frequent recruitment. Many countries, such as the United States and the United Kingdom, are actively implementing career planning systems that allow personnel to see their growth prospects. This includes gradual promotion of military personnel based on their experience and qualifications. This approach reduces the costs associated with recruitment and extra training of new recruits and prevents shortages of specialists. Career planning systems that ensure gradual advancement can reduce staff turnover and stabilise personnel, which positively affects the overall effectiveness of the armed forces (Edström & Gyllensporre, 2023). The cost of extra education and training of new personnel is then reduced by maintaining a stable staff.

Exacting standards of recruitment are critical to ensuring the quality of the armed forces. Selection based on specific qualification requirements helps to reduce training costs, as candidates with basic skills and knowledge are attracted at the recruitment stage. For instance, Germany and Sweden have strict requirements for recruits, including psychological tests, physical fitness, and technical skills (Panesar, 2022). Selection based on high standards ensures that quality personnel are ready for service without the need for lengthy extra training. It also contributes to cost savings by reducing the number of individuals who do not complete their contract due to inadequate performance.

Continuing education and training are key aspects of maintaining the competence of military professionals. The lack of regular professional development can lead to a loss of relevant knowledge and skills, which affects overall performance. Lifelong learning systems, including regular training and courses, help to maintain the professional readiness and flexibility of military personnel. Investing in training contributes to long-term cost-effectiveness by reducing the need to constantly recruit new personnel. It also reduces the cost of specialised training, as trained personnel are more easily adaptable to changing service conditions.

Social support and psychological support are crucial for retaining personnel in the armed forces, reducing the cost of frequent recruitment and replacement. The psychological well-being of military personnel directly affects their readiness to perform tasks. In NATO countries, including the United Kingdom and Canada, psychological care and support programmes are being implemented for military personnel and their families. Such programmes help to maintain a stable workforce and reduce the costs associated with staff turnover. Support aimed at the psychological well-being of the military considerably reduces stress levels and improves morale, which positively affects the effectiveness of the armed forces.

Modern armed forces require not only physical training but also skills in working with the latest technologies. The use of modern equipment requires an adequate level of knowledge and skills from military personnel, and therefore technology training is becoming a priority. Military personnel with technological skills can use resources more efficiently, which reduces the overall cost of servicing and maintaining equipment.

The introduction of technology into personnel training also provides flexibility in solving complex tasks requiring specialised knowledge and helps reduce the cost of lengthy training of new personnel. The use of technologically skilled personnel is becoming a crucial component of a successful human resources policy focused on cost-effectiveness.

For a more detailed study of these factors, a table was compiled to illustrate the key factors of human resources policy and their effect on economic performance in the armed forces of various countries (Table 1).

Table 1. Key factors of personnel policy in the armed forces and their effect on economic efficiency

Personnel policy factor	Description	Effect on economic indicators	Countries
Career growth planning	Systematic promotion of staff based on experience and qualifications	Reduces staff turnover and recruitment costs	United States, United Kingdom, India
Professional selection	Strict selection of recruits according to psychological, physical, and technical standards	Reduces the cost of extra training and dropout rates	Germany, Sweden
Qualification improvement and training	Regular training and development programmes to maintain professionalism	Reduces the need to replace staff and the cost of specialised training	Canada, Australia
Social support and psychological care	Psychological support and social security programmes for the military and their families	Reduces stress levels and replacement costs due to staff turnover	United Kingdom, Canada
Technological support	Training staff to work with the latest technologies	Increases resource efficiency and reduces maintenance costs	Israel, United States

Source: created by the authors based on data from the Department of National Defence supports the Canadian Armed Forces (n.d.), Israel's Ministry of Defence (n.d.), India's Ministry of Defence (n.d.), Ministry of Defence of Pakistan (n.d.), Ministry of Defence of Ukraine (n.d.), Australia's 2023 Defence Strategic Review (2023), Ministry of Defence of the United Kingdom (2024) and Department of Defence of the United States (2024), European Defence Agency (2024), Stockholm International Peace Research Institute (2024)

To illustrate the effectiveness of the above factors, it is useful to provide a graph comparing the costs of key aspects of personnel policy, such as training and social support, and their effect on the overall effectiveness of the armed forces in the most defensively effective countries in Europe (Fig. 1).

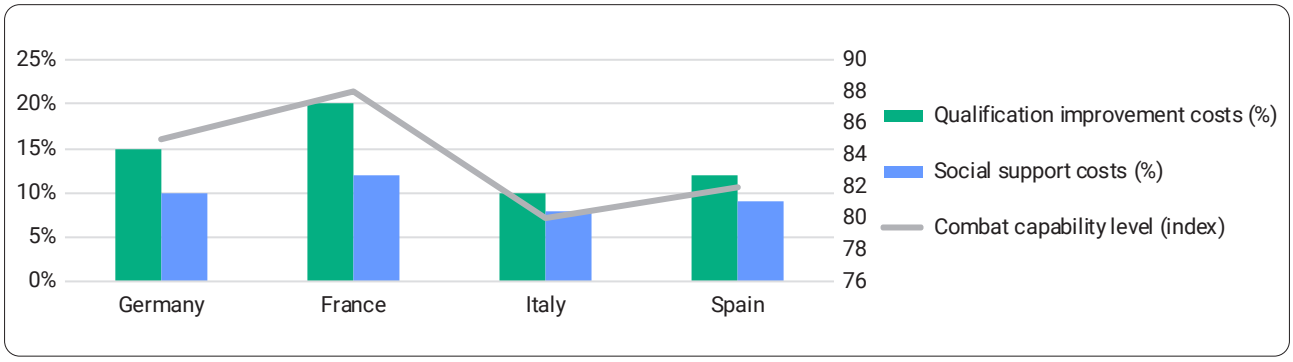

Figure 1. Comparison of the costs of various factors of human resources policy in selected European countries
Source: created by the authors based on data from A. Calcara & L. Simón (2024)

In the case of Ukraine, the personnel policy of its defence sector is aimed at adapting to new security challenges, increasing the professionalism of military personnel, and ensuring proper training of personnel. One of the key aspects is the professionalisation of the Armed Forces of Ukraine, which involves a gradual transition from conscription to contract staffing (Kormych *et al.*, 2024). This allows improving the quality of personnel training and ensuring a greater level of reliability in the face of modern threats.

Training and retraining of military personnel are also being actively reformed. Ukrainian military educational institutions, including the National Defence University of Ukraine, are adapting their training programmes to NATO standards, involving international partners, which increases the level of professionalism among officers and sergeants (Shahini *et al.*, 2024). Particular attention is paid to psychological support and rehabilitation of servicemembers, considering the conditions of combat operations. Psychological support and rehabilitation programmes after combat situations help to reduce the rate of dismissals due to psychological problems and maintain personnel stability in military units. Social protection of servicemembers and their families is another crucial element of the personnel policy. Programmes are in place to improve housing conditions, medical care, access to education, and retraining after military service. These measures are intended to raise the prestige of the military profession, attracting new candidates to military service. Ukraine also seeks to ensure gender equality in the armed forces by developing programmes that promote the role of women in the military. This allows expanding the personnel base and incorporating gender aspects into personnel management. Another major area of personnel policy is the integration of NATO standards, which involves adapting training, personnel management, and social support methods to the Alliance's standards (Kostyuk & Brantly, 2022). This helps to strengthen defence structures and increases the efficiency of human resource management.

Furthermore, considerable attention is paid to fighting corruption and ensuring transparency of personnel policy, which increases trust in military structures and ensures more efficient use of resources. However, challenges persist in the form of the need for extra funding to implement programmes, strengthen human resources in the context of military conflict, and further implementation of new training standards that capture the current experience of combat operations.

Economic efficiency in the defence sector largely depends on the chosen human resources management model. Countries use varying approaches to recruitment, training, and retention of military personnel, aimed at reducing costs and increasing functional efficiency. Contract recruitment is an effective way of managing personnel, used in many countries to reduce staffing costs. This model involves short- or medium-term contracts, which allows for flexible management of staffing levels to adapt to current defence needs. Engaging civilians to fill non-critical positions in the defence sector also contributes to cost savings, as the salary fund for such positions is lower. Employing civilians in positions such as logistics and administration reduces overall costs while maintaining a strong level of functionality (Yatsiv *et al.*, 2024). This approach allows spending to be focused on key combat personnel, thus increasing the efficiency of the defence sector overall.

In countries that prioritise staff stability and professional growth, the long-term workforce planning model is actively used. This model is aimed at supporting highly qualified specialists by providing them with career prospects and long-term contracts. This approach helps to reduce the cost of permanent recruitment and increases the motivation of the military to stay in service for a long time.

A. van Vark (2021) highlighted that long-term workforce planning reduces the costs associated with personnel replacement and contributes to the formation of highly professional personnel. In the case of Norway, for instance, the implementation of long-term contracts

for key personnel has increased efficiency while reducing the number of recruitments and the cost of training new personnel.

In cases where the defence sector needs to recruit personnel quickly for temporary or specialised tasks, short-term training programmes can be effective. These programmes are aimed at quickly teaching the basic skills needed to perform particular tasks, including in emergency situations. The advantage of this model is that it reduces training costs and responds quickly to current needs. The use of short-term training programmes during periods of increased tension enabled recruits to quickly adapt to concrete tasks without the need for long-term courses (Caliskan & Liégeois, 2020). This saves money in the short term, especially when staffing needs are temporary.

The rotation of personnel with intensive training is another model that allows for the efficient use of available resources without incurring considerable extra costs. Military personnel who already have basic training undergo periodic training to develop new skills and improve their qualifications. This provides flexibility in the distribution of personnel to fill various positions and reduces the cost of new recruitment.

In some countries, such as the United States and the United Kingdom, defence institutions use hybrid human resource management models, combining elements of contract recruitment, long-term planning, and short-term training programmes. This enables flexible adaptation of the number and training of personnel depending on the situation. Thus, in cases of temporary threats or crises, short-term contracts are used, while core staff are maintained on long-term contracts. For example, hybrid models implemented in Romania allow for operational readiness while reducing the cost of long-term staffing (Jude, 2022). Such a model demonstrates cost-effectiveness, allowing for optimum resource management and increased functionality of military structures.

SWOT analysis was applied to the human resources management models of the armed forces of countries such as the United States, the United Kingdom, Germany, Sweden, Canada, Australia, Israel, France, Italy, Spain, India, Romania, Pakistan, Norway, and Ukraine to examine their characteristics in detail, which helped to identify the strengths and weaknesses of each approach, as well as the opportunities and threats they pose to the cost-effectiveness of the defence sector (Table 2).

Table 2. SWOT analysis of personnel management models in the armed forces of the United States, the United Kingdom, Germany, Sweden, Canada, Australia, Israel, France, Italy, Spain, India, Romania, Pakistan, Norway, and Ukraine

Parameter	Description
Strengths	Contract hiring: allows for flexible adaptation of the number of staff, reducing staffing costs. Long-term workforce planning: ensures the stability and development of staff qualifications, reducing the cost of frequent recruitment. Rotation with intensive training: maintains staff flexibility and multifunctionality, avoids new recruitment. Hybrid model: combines elements of multiple approaches to adapt to situational needs, optimising costs and maintaining readiness.
Weaknesses	Contract hiring: risk of low motivation due to the short-term nature of contracts, low loyalty to military service. Long-term planning: requires high costs for long-term staff retention and career development prospects. Short-term programmes: effective only for basic tasks; may reduce professionalism. Hybrid model: can complicate personnel management due to the heterogeneity of approaches, especially when different models are used simultaneously.
Opportunities	Engagement of civilian specialists: reduces costs by focusing military resources on combat positions. Intensive training and rotation: reduces the need for new recruitment and allows for a stable level of expertise. Hybrid models: Enables adaptation of the number and structure of personnel in case of emergencies or temporary threats. Long-term planning: reduces the cost of training new staff and stabilises the professional composition.
Threats	Dependence on short-term staff: may affect the ability to operate in case of a prolonged emergency. High competition for skilled personnel: especially for civilian professionals, who are also recruited by the private sector. Unstable funding: may limit the ability to use long-term models and deploy hybrid approaches. Risks of short-term programmes: insufficient training can affect operational effectiveness in complex tasks.

Source: created by the authors based on data from the Department of National Defence supports the Canadian Armed Forces (n.d.), Israel's Ministry of Defence (n.d.), India's Ministry of Defence (n.d.), Ministry of Defence of Pakistan (n.d.), Ministry of Defence of Ukraine (n.d.), Australia's 2023 Defence Strategic Review (2023), Ministry of Defence of the United Kingdom (2024) and Department of Defence of the United States (2024), European Defence Agency (2024), Stockholm International Peace Research Institute (2024)

Such an approach helps not only to assess the extent to which each model contributes to cost optimisation and sustainment, but also to identify potential areas for improvement. By considering contract recruitment, long-term workforce planning, short-term training programmes, intensive rotational training and the hybrid

model, the SWOT analysis provides a comprehensive assessment of which model best meets the specific needs of military structures in different situations.

Human resources policy in the defence sector is closely linked to cost-effectiveness, affecting budgetary expenditures and the maintenance of the armed forces' combat capability. Establishing the link between personnel costs and functional effectiveness requires the analysis of indicators that reflect how investments in personnel policy affect productivity, crisis resilience, and combat readiness.

Investments in personnel training and career development support are a crucial factor in ensuring readiness. Studies show that countries that invest heavily in training and professional development demonstrate higher levels of combat readiness and operational effectiveness. In cases of crisis, such personnel adapt more quickly to new conditions, having a better level of technical and strategic training.

Countries with a great level of investment in training, such as the United States and the United Kingdom, maintain a consistently strong level of combat readiness and can conduct military operations more effectively. The example of Romania, where vocational training programmes are being actively implemented, demonstrates that such investments increase the efficiency of resource use and save on the cost of hiring external specialists (Nemeth, 2024).

Providing social support for military personnel and their families affects the economic efficiency of the defence sector by reducing staff turnover and boosting morale. A strong psychological resilience of personnel reduces the costs associated with the replacement and rehabilitation of military personnel facing severe stress.

An analysis by the RAND Corporation shows that NATO countries, including Canada, are actively implementing psychological support programmes for military personnel, which helps to reduce the rate of dismissals due to psychological problems and reduces the cost of recruiting and training new personnel.

One key aspect of cost-effectiveness is investing in technological skills training that enables the military to effectively use modern equipment and innovative systems. The introduction of advanced technologies in military training reduces the cost of maintaining equipment, increasing productivity and functional readiness. In Europe, particular focus is being placed on the introduction of technology into the defence sector, which considerably increases the efficiency of using available resources. Training personnel to work with the latest technologies reduces the cost of lengthy training and saves on the maintenance and operation of equipment due to its more competent use.

Another major aspect is the ability of the military to adapt to crisis situations, which depends on the effectiveness of human resources policy. Countries that invest in long-term retention strategies demonstrate a greater level of resilience to unforeseen situations. Military personnel with experience and psychological resilience are better prepared to meet challenges, which minimises the cost of crisis management.

The defence sectors of the countries considered in this study demonstrate considerable diversity in their approaches to security, resource allocation, and strategic priorities. The key factors that determine the specific features of the defence structures of these countries include the military budget, the number of military personnel, the technological level, personnel training, the presence of a defence industry, and membership in international security organisations such as NATO or the EU (Hooker, 2022). A comparison of these criteria in different countries is presented in Table 3.

Table 3. Comparison of the key parameters of the defence sector in various countries

Country	Military budget (USD bn)	Number of military personnel (thsd people)	Key defence priorities	Membership in organisations
United States	801	1,380	Global security, nuclear deterrence	NATO
United Kingdom	68	148	European security, strategic deterrence	NATO
Germany	55	183	European security, NATO	NATO, EU
Sweden	7	20	Territorial defence	NATO
Canada	26	68	North American security, international missions	NATO
Australia	44	59	Regional security in the Asia-Pacific region	ANZUS
Israel	24	170	Missile defence, regional security	–
France	56	205	Nuclear deterrence, European security	NATO, EU
Italy	32	165	NATO, international missions	NATO, EU
Spain	19	124	European security, NATO	NATO, EU
India	77	1,450	Regional security, confrontation with Pakistan	–
Romania	5	70	Regional security, modernisation	NATO, EU
Pakistan	10	654	Confrontation with India, internal security	–
Norway	8	25	Territorial defence	NATO

Table 3, Continued

Country	Military budget (USD bn)	Number of military personnel (thsd people)	Key defence priorities	Membership in organisations
Ukraine	44	700	Defence against external aggression, NATO support	–

Source: created by the authors based on data from the Department of National Defence supports the Canadian Armed Forces (n.d.), Israel's Ministry of Defence (n.d.), India's Ministry of Defence (n.d.), Ministry of Defence of Pakistan (n.d.), Ministry of Defence of Ukraine (n.d.), Australia's 2023 Defence Strategic Review (2023), Ministry of Defence of the United Kingdom (2024) and Department of Defence of the United States (2024), European Defence Agency (2024), Stockholm International Peace Research Institute (2024)

Table 3 demonstrates considerable differences between countries in terms of funding, personnel, and key defence priorities, reflecting both national strategic objectives and military capabilities. According to the table, the United States has the largest defence budget in the world, which allows it to invest heavily in advanced technology, intelligence, and global military operations. The United Kingdom and France also have high defence spending and maintain a nuclear arsenal that provides strategic deterrence. Germany has been increasing its defence budget in recent years due to NATO requirements and strengthening its defence capabilities but has historically focused on European security. Sweden and Norway have considerable forces to defend their territories, with Sweden recently joining NATO, increasing its strategic significance.

Canada and Australia are close allies of the United States, supporting defence efforts globally, especially in the Asia-Pacific region. Israel is noted for its defence innovations, particularly in cybersecurity and missile defence systems. India and Pakistan possess nuclear weapons and are focused on regional defence, while both countries are investing heavily in modernising their armed forces. Romania and Ukraine are actively modernising their defence systems due to their proximity to conflict regions, with Ukraine relying heavily on support from Western partners. Italy and Spain have well-organised military forces that support international missions of NATO and the UN.

Based on the study conducted, recommendations were developed to improve the cost-effectiveness of the armed forces by optimising human resources policies. The use of human resources strategies that focus on long-term training, adaptability, social welfare, and technological training can reduce costs without compromising the functional readiness of the armed forces.

Flexible recruitment programmes are recommended to maintain stability and reduce the cost of permanent recruitment. This can include short-term contracts for personnel performing non-critical functions and long-term contracts for highly qualified military personnel. Flexible programmes enable the best use of resources, reducing staffing costs. Long-term contracts also help to retain qualified personnel, reducing the need for constant recruitment, and cutting training costs. This approach reduces staff turnover, which contributes to stability and cost savings.

An effective human resources policy involves continuous training and development to ensure that staff can meet modern challenges (Novykova *et al*., 2022). It is recommended to develop regular professional development programmes, including trainings, certifications, and specialised courses. Such programmes can reduce the cost of training new recruits while ensuring the continuous development of existing staff skills. Countries that invest in the professional development of their military demonstrate a greater level of cost-effectiveness, as trained personnel are more easily adaptable to change. This reduces the cost of extra training, as personnel maintain their qualifications at the required level.

One of the key recommendations is to introduce psychological support and social welfare programmes for military personnel and their families. Creating a supportive environment helps to retain personnel and boost morale, which reduces the cost of frequent recruitment due to staff turnover. Psychological support programmes reduce stress levels, which helps to maintain stability and productivity. Social programmes also help to support the military in crisis situations, contributing to their ability to adapt. These programmes include access to healthcare, financial aid, and other social benefits that support strong staff engagement and reduce the costs of dismissals.

Considering the rapid development of technology, military personnel must be skilled in the use of modern equipment. It is recommended to include mandatory technological training programmes in the personnel policy to enable the military to adapt to the latest technological systems. This will increase the efficiency of resource use and reduce maintenance costs through skilful handling of equipment. Investing in technology training can increase the flexibility of personnel and their readiness to work in a rapidly changing environment, while ensuring long-term cost-effectiveness. Preparing the military to use technology reduces maintenance costs and increases productivity.

To reduce costs in non-security-critical areas, it is recommended to engage civilian specialists, such as logisticians, administrators, and medical personnel. The use of civilians to perform support functions can reduce salary costs, as civilian personnel are usually cheaper than military personnel (Kyrylov *et al*., 2024). Civilians can provide support services, allowing the armed forces to focus on core combat missions without having to divert resources to support functions. This reduces the cost of providing military personnel for non-critical functions, leaving more resources to maintain combat readiness.

To continuously improve the personnel policy, it is recommended to introduce systems of feedback and regular evaluation of personnel. This allows problems, such as low productivity or lack of motivation, to be promptly identified and corrective action taken. Evaluation programmes help to improve the effectiveness of human resources policies and ensure that resources are used accurately to meet staff needs. Implementation of a feedback system and regular personnel assessment enables not only prompt identification of problems, but also the development of individual development plans for staff. This approach increases employee motivation as they gain a clear understanding of their strengths and areas for improvement. Furthermore, assessments allow for efficient allocation of human resources by identifying which skills and competencies should be strengthened within the human resources policy.

Assessment systems also promote transparency in career development decisions, which increases staff trust in management. Regular feedback ensures more effective communication between service members and commanders, fostering a culture of openness and support. Military service is often associated with elevated stress levels, which can lead to staff exhaustion. The introduction of flexible working arrangements and leave opportunities, especially for personnel in difficult environments, can help to increase productivity and reduce the risk of turnover. Flexible schedules allow for a work/life balance that positively affects efficiency at no extra costs.

The use of reservists to perform auxiliary or temporary tasks can greatly reduce the cost of maintaining permanent staff. Reservists are deployed on an ad hoc basis, which reduces the cost of permanent staff while ensuring that functionality is maintained in crisis situations. The use of reserve forces increases the flexibility and efficiency of the defence sector. To summarise all the recommendations, a table was compiled that shows their key economic advantages and benefits for maintaining the readiness of the armed forces (Table 4).

Table 4. Recommendations for optimising the personnel policy of the armed forces: economic benefits and advantages for combat capability

Recommendation	Description	Economic benefits	Advantages for combat capability
Flexible hiring programmes and long-term contracts	Introduction of short-term and long-term contracts to reduce recruitment costs	Reduces the cost of frequent recruitment	Ensures personnel stability
Support for professional development and continuous learning	Regular training and certification for current personnel	Reduces the cost of training new recruits	Ensures highly qualified personnel
Social support and psychological resilience	Social support and psychological support programmes	Reduces personnel turnover	Improves the morale of the military
Technological training and competence development	Training personnel to work with modern technologies	Reduces maintenance costs	Increases technological readiness
Engagement of civilian specialists for non-critical functions	Engagement of civilians in support roles	Reduces payroll costs	Focus on combat functions
Feedback and evaluation programmes	Regular evaluation of personnel performance to adjust policies	Optimises the use of resources	Maintains a strong productivity level
Flexible service and leave schedules	Introduction of flexible working hours to reduce stress	Reduces turnover costs	Supports the psychological health of the military
Use of reserve forces	Engagement of reservists to perform auxiliary tasks	Reduces the cost of a permanent staff	Increases flexibility in times of crisis

Source: created by the authors

Table 4 illustrates key recommendations that can substantially improve the cost-effectiveness of human resources policy in the armed forces without compromising combat capability. Each of the strategies presented has considerable economic benefits, including reduced personnel costs, optimised resources and reduced turnover. At the same time, these measures contribute to boosting morale and resilience of personnel to stress, as well as maintaining a strong level of combat readiness.

The proposed approaches allow the armed forces to adapt flexibly to changing conditions, ensuring a balance between costs and the need for qualified personnel. Thus, the implementation of these recommendations will contribute not only to the stability of personnel, but also to the efficient allocation of resources, which is critical for long-term sustainability and successful defence tasks.

For Ukraine, which is in the midst of an active military conflict, the implementation of recommendations to optimise human resources policy is a crucial step towards strengthening the combat capability and economic sustainability of the armed forces (Dzhulai, 2023). Considering the prominent level of personnel mobility and the need to maintain morale, it is advisable to introduce flexible recruitment programmes and contracts of various durations. This will help reduce the cost of permanent recruitment and ensure stability in military units, especially at the frontline.

Professional development and continuous training are essential to improve the skills of existing personnel, which,

in the context of the rapid introduction of modern military technologies, will help optimise the cost of training recruits and ensure high readiness for complex tasks. Psychological support and social care for the military and their families are also critical in the context of prolonged hostilities. Psychological support programmes will help to reduce personnel turnover and maintain military morale, which is essential for maintaining combat capabilities.

Furthermore, the development of technological competencies among personnel will enable them to effectively use the latest defence and communications equipment, which will help to increase the technological readiness of the Armed Forces of Ukraine and reduce equipment maintenance costs. The use of civilian specialists to perform support tasks, such as logistics, technical support, and medical care, will allow military specialists to focus on combat functions, optimising salary costs, and increasing the overall effectiveness of the defence capability.

The use of reservists to support auxiliary tasks will help Ukraine maintain flexibility in crisis situations by providing an operational reserve for combat operations. Implementation of these recommendations will allow Ukraine to increase combat capability, optimise the use of resources and stabilise the personnel, which is crucial for successful defence and national security in the face of prolonged confrontation.

Discussion

The analysis of the study findings showed the value of an integrated approach to human resources management in the armed forces to enhance economic sustainability and combat capability. Key aspects, such as career planning, selection standards, professional development, and social support, have a decisive impact on the efficiency and sustainability of the defence sector. Comparing these findings with those of other authors allows assessing the consistency of the results and highlighting areas for further research.

H. Edström & D. Gyllensporre (2023) confirmed that career planning systems that provide gradual promotion and development prospects reduce staff turnover and contribute to cost savings. This is in line with the findings of the present study on the role of career planning as a method of stabilising the workforce and reducing recruitment costs. At the same time, M. Mantovani & R. Müllhaupt (2021) noted that long-term career development programmes can create an incremental burden on the budget due to long-term development investments. The above findings, while confirming the high cost-effectiveness of this approach, point to the significance of balancing investments in career development with short-term staffing needs to avoid budget overload.

Recruitment standards, as evidenced by R. Panesar (2022) and the present study, also significantly affect the cost-effectiveness of the armed forces. The analysis noted that strict requirements for candidates, including psychological and physical tests, reduce training costs and ensure better readiness of recruits. This is consistent with the findings of M. Mantovani & R. Müllhaupt (2021), who also emphasised that strict selection standards contribute to the retention of highly qualified personnel. However, T. Bunde (2021) pointed out that excessive standardisation of requirements can limit access to military service for individuals with potentially useful skills, which can reduce the adaptability of the armed forces. Thus, the question of the optimum level of selection rigour requires further study to determine the balance between quality and flexibility.

Professional development and regular training of personnel are also important aspects of cost-effectiveness, as the study showed. Maintaining the skills of the military at a certain level helps to maintain readiness and avoid extra costs for personnel replacement. These findings are consistent with those of A. Connelly & S. Loong (2023), who also emphasised the value of investing in continuous training to improve the overall effectiveness of the armed forces. At the same time, J. Horncastle (2022) pointed out the need to adapt training programmes to rapidly changing defence technologies, which requires a more flexible approach than conventional training methods.

Social support and psychological support, as confirmed by the present study, are critical to maintaining the stability of the personnel and saving on permanent recruitment. This is consistent with the findings of I. Antai *et al*. (2023), who emphasised the role of social programmes in staff retention. However, J. Horncastle (2022) also indicated that social support can become an incremental financial burden for defence budgets if not integrated into a broader human resource management strategy. Thus, the findings highlight the significance of a balance of social support to maintain economic sustainability.

The analysis of the findings on the significance of technological training in the armed forces confirms the role of technological skills in increasing economic efficiency. Preparing the military to work with the latest technologies enables efficient use of available resources, reducing the cost of equipment maintenance, and increases flexibility and responsiveness in performing complex tasks. The findings of this study are supported by F. Wenas Inkiriwang (2020), who pointed out that investments in technological training are essential for the operational diplomacy of the defence sector, especially in the context of the active use of modern equipment and increasing technical requirements for personnel.

At the same time, S. Rolfe & I. Anderson (2022) study focusing on the needs of veterans indirectly corroborated the value of technological training, as the adaptation of personnel to civilian life also often depends on the acquired technological skills. This shows that investments in technological training have a long-term impact on the social and economic stability of personnel after service, which is consistent with the findings on the economic feasibility of such policies.

The analysis of Ukraine's defence human resources policy highlights the significance of adapting to new security challenges, especially in the context of conflict and integration into NATO standards (Ivanov *et al*., 2020). The findings showed that professionalisation and social support for the service personnel contribute to human resources stability and increase the combat capability of the Armed Forces of Ukraine.

B. Kormych *et al*. (2024) stressed the need for flexible approaches to protection, including the creation of humanitarian corridors, which requires personnel stability and readiness. The study by N. Kostyuk & A. Brantly (2022) on cyber warfare showed the limitations of interstate cooperation in protecting infrastructure, which confirms the role of technological training and highly qualified personnel. Psychological support, according to K. Kravchenko *et al*. (2023), is critical for maintaining combat readiness and reducing staff turnover.

The findings of the study on various models of personnel management in the armed forces confirmed that the economic efficiency of the defence sector largely depends on the choice of approach to recruitment, training, and retention. Comparison with the findings of other researchers offered a deeper understanding of why certain models provide higher functional efficiency and at the same time contribute to cost reduction.

The findings on contracting and civilian recruitment are consistent with those of D. Druck (2021), who analysed approaches in Israel. The study noted that the reduction of permanent staff in favour of contract workers allows saving resources for strategically significant positions. However, according to M. Riemann & N. Rossi (2022), in crisis situations, the contract model can pose challenges due to the instability of the staff, which requires extra adaptation and planning.

The conclusions on the economic efficiency of long-term workforce planning coincide with those of H. Edström & D. Gyllensporre (2023), who indicated that the Nordic countries, by investing in long-term staff retention, managed to stabilise the workforce and reduce recruitment costs. At the same time, V. Vignoli (2024) addressed the risks associated with the costs of social support under such programmes, especially when the country's economic conditions change, which can make long-term planning challenging.

The use of short-term training programmes was found to be an effective way to respond quickly to crisis situations. This conclusion is supported by India's defence transformation (2022), which highlighted that short-term training provides operational flexibility in emergencies. However, V. Vignoli (2024) pointed out the limitations of short-term programmes in cases where personnel need to be integrated into longer missions that require extra skills.

The rotational model with intensive training, according to E. Sabatino (2022), allows maintaining a strong level of competence among personnel without the need to constantly recruit new personnel. The findings presented in this study confirm this, demonstrating that rotation promotes flexibility and reduces the cost of new staff. Therewith, M. Riemann & N. Rossi (2022) indicated that frequent rotation can lead to staff attrition in cases of long and intense operations.

In terms of hybrid models, the study findings suggested that a combination of contract hiring, long-term plans, and short-term training programmes can provide optimum flexibility and savings. This is confirmed by S. Jude (2022), who noted the effectiveness of hybrid models in the Romanian context. However, D. Druck (2021) pointed out the potential difficulties in managing such a heterogeneous workforce, which may require extra coordination costs.

The study showed that an effective personnel policy is a key factor in the economic stability and combat capability of the armed forces. The analysis of the data and their comparison with the studies of other researchers emphasise the value of investing in training, social support, and technological skills.

B. Nemeth (2024) noted that investment in training is crucial for maintaining combat readiness and effective military operations, which is consistent with the results presented in this study. Both Nemeth's and the present findings highlighted those countries with active training programmes, such as the United States and the United Kingdom, achieve stable readiness rates, which enables faster response to crises and efficient allocation of resources. This is in line with the findings of C. Håkansson (2021) on the significance of technological innovation in the EU armed forces, which promotes the economical use of resources, releasing funds for other strategic needs.

The findings on social support and psychological resilience are also in line with those of T. Bradshaw (2021), who highlighted that maintaining military morale, especially through specialised programmes for veterans, contributes to the stability of the personnel. Psychological support programmes implemented in Canada reduce recruitment costs and increase cost-effectiveness by reducing staff turnover. In this aspect, the study is also consistent with the findings of D. Dudley (2020), who noted that defence sector reforms in Montenegro aimed at psychological support are essential to build resilience and reduce the cost of training new personnel.

Investing in the technological skills of military personnel is critical to ensuring functional effectiveness. As the study findings showed, training the military to operate modern equipment and technologies is essential to reduce maintenance costs. This is in line with the findings of Australia's 2023 Defence Strategic Review (2023), which emphasised that technology training for the military avoids unnecessary maintenance costs and reduces the need for external experts to support the latest systems.

An analysis of the defence sector in various countries revealed considerable differences in funding, military strength, priorities, and international commitments. The United States has the largest defence budget in the world, which supports its global military presence. The United Kingdom and France also spend heavily on defence, while maintaining nuclear arsenals for European deterrence. Germany is strengthening its defence capabilities in response to NATO requirements. Sweden and Norway are focusing on territorial defence, while Sweden's accession to NATO increases its strategic significance. Canada and Australia support global defence initiatives, especially in the Asia-Pacific region. Israel stands out for its innovations in cybersecurity and missile defence, which are essential for regional stability. India and Pakistan are developing nuclear capabilities while modernising their armed forces.

Comparing the present study with those of R.D. Hooker (2022) and M. Caliskan & M. Liégeois (2020), there is a consistency with the general assessment of NATO. R.D.Hooker stressed the value of sustained defence investment in maintaining regional security, as evidenced by the high spending by the United States, the United Kingdom, and France. R.D.Hooker also noted that NATO must adapt to new threats, which is relevant considering the growth of defence spending in Europe. M. Caliskan & M. Liégeois noted that the concept of 'hybrid warfare' complicates NATO's strategic planning, confirming the need for approaches to respond to asymmetric threats. Israel's experience in implementing innovations to combat hybrid threats can be useful for NATO countries (Vilks *et al*., 2024).

The recommendations developed based on the study support current trends in defence personnel policy, which are focused on increasing the cost-effectiveness and adaptability of the armed forces. The significance of flexible recruitment programmes, including the use of civilians for support functions, is consistent with the findings of V.M. Santos & M. Siman (2022), who emphasised the economic benefits of using civilians in non-critical roles. This releases resources to support combat readiness, which is in line with the strategic needs of the armed forces.

A study by F. Wenas Inkiriwang (2020) reinforced the role of technology training, as the development of technological skills of the military increases their flexibility and effectiveness in performing tasks. The use of advanced technologies helps to reduce maintenance costs by reducing the need for external experts and increases productivity, which was considered in the recommendations for the implementation of technology training programmes to improve functional readiness.

In terms of social support and psychological well-being, the study findings are in line with the recommendations of T. Bunde (2021), who emphasised the significance of social stability and psychological support for retention. The recommendations include psychological care and support programmes for military families, which helps to reduce staff turnover and maintain high morale, contributing to the economic stability of the defence sector.

The use of reservists as an alternative resource for crisis situations is in line with the findings of the India's defence transformation (2022) study, where reserve forces are used to maintain operational flexibility. This reduces the cost of maintaining a permanent force while maintaining combat capability in a crisis. The use of reserves is a cost-effective method that also supports the flexibility of personnel management, which is key for modern military structures.

The analysis of recommendations for optimising the human resources policy of the Ukrainian defence sector highlights the role of adaptability and effective resource management in an active conflict. Flexible recruitment programmes, professional development, and psychological support are key to the stability and combat readiness of personnel, as well as to optimising costs by engaging civilian specialists and reservists for support functions (Ponomarenko & Pysarchuk, 2024).

The study by B. Kormych *et al*. (2024) on humanitarian corridors in the Black Sea confirmed the significance of stable and competent personnel for flexible protection strategies. This is in line with recommendations for the adaptability of Ukraine's human resources policy. N. Kostyuk & A. Brantly (2022) emphasised the need for technological readiness, which supports proposals to train the Ukrainian military to work with the latest technologies. The psychological support described by K. Kravchenko *et al*. (2023), is vital to reduce personnel turnover and maintain military morale. Proposals for social and psychological care will contribute to the resilience of personnel.

Thus, the developed recommendations are consistent with the findings of other researchers and emphasise the value of an integrated approach to human resources policy in the defence sector, focused on long-term stability and flexibility in the use of resources.

Conclusions

The study highlighted the role of human resources policy in the armed forces as one of the key factors of economic efficiency and stability of the defence sector. Based on the analysis, the effectiveness of human resources policy largely depends on several key factors. Career planning, selection standards, professional development systems, social support, and the introduction of technology ensure both cost savings and the maintenance of a strong professionalism of military personnel. In summary, the analysis confirmed that human resources policy forms an integral part of the economic efficiency of the armed forces.

A comparative analysis of human resources management models in the armed forces of different countries showed that the choice of a particular model depends on the strategic goals and economic capabilities of the defence sector. Contract recruitment, long-term planning, short-term training programmes, rotational models, and hybrid approaches demonstrate distinct levels of cost-effectiveness. Countries with greater financial resources (such as the United States, the United Kingdom, and France) can afford long-term workforce development strategies, while countries with limited budgets prefer short-term and hybrid approaches. Specifically, Sweden and Norway are focused on territorial defence, which is reinforced by Sweden's accession to NATO. Israel stands out for its innovations in cybersecurity and missile defence, while India and Pakistan are developing nuclear capabilities while modernising their armed forces.

It is recommended to introduce flexible recruitment programmes that enable both short-term contractors and civilian specialists to perform non-critical functions. This approach helps to concentrate resources on core defence tasks and reduces the cost of supporting support roles. An essential area is the technological training of personnel, which enables the military to use modern equipment more efficiently and helps to save on maintenance.

For Ukraine, which is in the midst of an active military conflict, an adaptive approach to human resources policy is particularly important. Flexible recruitment programmes and the use of reservists can help respond quickly to changes. Developing the technological skills of the military will help to ensure efficient use of equipment, which is critical to reducing maintenance costs on a tight budget. Social support, such as psychological care programmes, boosts morale and helps to reduce staff turnover, which helps to maintain combat readiness.

However, the study had certain limitations: the dependence of the findings on the availability of modern programmes and technologies, as well as on financial resources for their implementation. Further research can be aimed at exploring concrete methods of adapting the recommendations to conditions with a limited budget, which will expand the possibilities of using these recommendations.

The proposed recommendations can increase the economic efficiency of the armed forces by reducing personnel costs, maintaining their combat capability, and adapting the personnel structure to the rapidly changing conditions of the modern defence environment. Implementation of such approaches will contribute to the efficient use of resources in the armed forces, increase their readiness and long-term sustainability of the defence sector.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Antai, I., Hellberg, R., & Skoglund, P. (2023). Logistics growth in the armed forces: Development of a theoretical framework and research propositions. *Defence Studies*, 24(1), 84-106. doi: 10.1080/14702436.2023.2249441.
[2] Australia's 2023 defence strategic review. (2023). *Strategic Comments*, 29(3). doi: 10.1080/13567888.2023.2212988.
[3] Bradshaw, T. (2021). The evolution of the armed forces of the United Arab Emirates by Athol Yates (Warwick: Helion & Company Limited, 2020). pp. xv + 380. £35 (hardback). ISBN 9781912866007. *Middle Eastern Studies*, 57(5), 863-864. doi: 10.1080/00263206.2021.1928643.
[4] Bunde, T. (2021). Defending European integration by (symbolically) integrating European defence? Germany and its ambivalent role in European security and defence policy. *Journal of European Integration*, 43(2), 243-259. doi: 10.1080/07036337.2021.1877693.
[5] Calcara, A., & Simón, L. (2024). Face to face: France, Germany and the future of the European defence industry. *Journal of European Public Policy*. doi: 10.1080/13501763.2024.2358112.
[6] Caliskan, M., & Liégeois, M. (2020). The concept of 'hybrid warfare' undermines NATO's strategic thinking: insights from interviews with NATO officials. *Small Wars & Insurgencies*, 32(2), 295-319. doi: 10.1080/09592318.2020.1860374.
[7] Clarke, D. (2021). The rhetoric of civil-military relations in contemporary armed forces museums. *Journal of War & Culture Studies*, 16(1), 80-99. doi: 10.1080/17526272.2021.1878321.
[8] Connelly, A., & Loong, S. (2023). The relationship between the armed forces and the state. *Adelphi Series*, 63(505-507), 29-62. doi: 10.1080/19445571.2024.2359328.
[9] Coticchia, F., & Moro, F.N. (2023). The Italian armed forces and the new conflicts in Europe. *Contemporary Italian Politics*, 15(2), 219-236. doi: 10.1080/23248823.2023.2191231.
[10] Danley, M.H. (2023). Problems and possibilities for NACO armed forces access points: The cases of Serbia and Yugoslavia. *Cataloging & Classification Quarterly*, 61(2), 119-188. doi: 10.1080/01639374.2023.2189897.
[11] Department of Defence of the United States. (2024). *Annual reports*. Retrieved from https://history.defense.gov/Historical-Sources/Secretary-of-Defense-Annual-Reports/.
[12] Domínguez, M., Aparicio, J., & Fonfria, A. (2023). The defence economy: An assessment of productivity change in NATO countries. *Applied Economics*, 56(18), 2158-2175. doi: 10.1080/00036846.2023.2186355.
[13] Druck, D. (2021). 'The Reserves Will Hold': Changes in the Israel defense forces' operational concept. *The RUSI Journal*, 166(4), 40-50. doi: 10.1080/03071847.2021.1964099.
[14] Dudley, D. (2020). From challenged statehood to democratic civil-military relations: Defence reform in Montenegro. *Journal of Balkan and Near Eastern Studies*, 22(1), 84-102. doi: 10.1080/19448953.2020.1715667.
[15] Dyson, T., & Pashchuk, Y. (2022). Organisational learning during the Donbas War: The development of Ukrainian Armed Forces lessons-learned processes. *Defence Studies*, 22(2), 141-167. doi: 10.1080/14702436.2022.2037427.
[16] Dzhulai, M. (2023). Adaptation of the employer brand of a Ukrainian company in the EU market during the full-scale russian-Ukrainian war. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 10(1), 9-18. doi: 10.52566/msu-econ1.2023.09.
[17] Edström, H., & Gyllensporre, D. (2023). Exploring NATO's enlargements in Northern Europe: Theorizing military transformation. *Comparative Strategy*, 42(2), 264-286. doi: 10.1080/01495933.2023.2182111.
[18] Gavrysh, O., Gavrysh, I., Matiukhina, A., & Vasylets, I. (2024). The first year's impact of the full-scale war on Ukrainian business. *Economics of Development*, 23(1), 18-29. doi: 10.57111/econ/1.2024.18.

[19] Håkansson, C. (2021). The European Commission's new role in EU security and defence cooperation: The case of the European Defence Fund. *European Security*, 30(4), 589-608. doi: 10.1080/09662839.2021.1906229.
[20] Hooker, R.D. (2022). The state of NATO: An American view. *Survival*, 64(3), 103-113. doi: 10.1080/00396338.2022.2078049.
[21] Horncastle, J. (2022). The unsettled foundation: Self-management and its implications for Yugoslavia's policy of Total National Defence. *Defense & Security Analysis*, 38(1), 106-121. doi: 10.1080/14751798.2022.2030919.
[22] India's defence transformation. (2022). *Strategic Comments*, 28(6). doi: 10.1080/13567888.2022.2142363.
[23] India's Ministry of Defense. (n.d.). Retrieved from https://mod.gov.in/.
[24] Israel's Ministry of Defense. (n.d.). Retrieved from https://english.mod.gov.il/Pages/default.aspx.
[25] Ivanov, S., Yudina, S., Lysa, O., & Drahun, A. (2020). Classification and assessment of losses from the armed conflict in Donbas and annexation of Crimea. *Economic Annals-XXI*, 184(7-8), 107-123. doi: 10.21003/EA.V184-10.
[26] Jude, S. (2022). Geopolitical imaginations of war preparations: Visual representations of the Romanian armed forces' military exercises. *Critical Military Studies*, 9(3), 404-424. doi: 10.1080/23337486.2022.2106101.
[27] Kormych, B., Averochkina, T., & Kormych, L. (2024). Black Sea, grain, and two humanitarian corridors: Unblocking Ukrainian shipping amid the Russian invasion. *Small Wars & Insurgencies*, 35(8), 1360-1396. doi: 10.1080/09592318.2024.2384679.
[28] Kostyuk, N., & Brantly, A. (2022). War in the borderland through cyberspace: Limits of defending Ukraine through interstate cooperation. *Contemporary Security Policy*, 43(3), 498-515. doi: 10.1080/13523260.2022.2093587.
[29] Kravchenko, K., Khairulin, O., Danchevskyi, S., Pavlushenko, S., & Chernobai, L. (2023). Psychological defense mechanisms of military service members as a personality stabilization regulatory system for combat mission effectiveness. *Journal of Military Ethics*, 22(1), 72-84. doi: 10.1080/15027570.2023.2235759.
[30] Kyrylov, Yu., Ibatullin, M., Konovalenko, A., Shylo, Zh., & Pochernina, N. (2024). Global changes in the development of the export potential of the grain sub-complex of the agrarian sector of Ukraine. *Ekonomika APK*, 31(3), 22-33. doi: 10.32317/2221-1055.2024030.22.
[31] Lindgren, P.Y., & Ofstad Presterud, A. (2021). High unemployment and the armed forces: The costs and benefits of recruiting military personnel in Norway. *Defence and Peace Economics*, 34(3), 360-384. doi: 10.1080/10242694.2021.2008190.
[32] Malik, N. (2024). Guns better than education: Political economy of defence, radical education policies, textbooks, and teachers' outlook in Pakistan. *Journal of Education Policy*. doi: 10.1080/02680939.2024.2419665.
[33] Mantovani, M., & Müllhaupt, R. (2021). Analysing armed forces transformation: Methodology and visualisation. *Defense & Security Analysis*, 37(3), 364-380. doi: 10.1080/14751798.2021.1959731.
[34] Ministry of Defence of Pakistan. (n.d.). Retrieved from https://mod.gov.pk/index.
[35] Ministry of Defence of the United Kingdom. (2024). *Ministry of Defence Annual Report and Accounts 2023 to 2024*. Retrieved from https://www.gov.uk/government/publications/ministry-of-defence-annual-report-and-accounts-2023-to-2024.
[36] Ministry of Defence of Ukraine. (n.d.). Retrieved from https://mod.gov.ua/en.
[37] Nemeth, B. (2024). South Korean military power: Lessons Europe can learn from Seoul on spending defence budgets efficiently. *The RUSI Journal*, 169(1-2), 92-101. doi: 10.1080/03071847.2024.2355136.
[38] Novykova, I., Chornyi, R., Chorna, N., Bey, R., & Leszczynski, V. (2022). Simulation of comprehensive assessments of personnel innovation development management system. *Lecture Notes in Networks and Systems*, 486, 95-108. doi: 10.1007/978-3-031-08087-6_7.
[39] Ortiz-Villajos, J.M., & Martos-Gómez, J.J. (2023). Military technology, defense spending and modernization of the armed forces: The case of Spain, 1891-1935. *Defence and Peace Economics*, 35(7), 883-907. doi: 10.1080/10242694.2023.2198912.
[40] Panesar, R. (2022). Accountability and the use of the armed forces. *Judicial Review*, 27(2), 161-185. doi: 10.1080/10854681.2022.2117945.
[41] Ponomarenko, V., & Pysarchuk, O. (2024). Peculiarities of the impact of learning losses on the formation of human capital in Ukraine under martial law. *Economics of Development*, 23(1), 38-52. doi: 10.57111/econ/1.2024.38.
[42] Riemann, M., & Rossi, N. (2022). From subject to project: Crisis and the transformation of subjectivity in the armed forces. *Globalizations*. doi: 10.1080/14747731.2022.2104017.
[43] Rolfe, S., & Anderson, I. (2022). Meeting the housing needs of military veterans: Exploring collaboration and governance. *Housing Studies*, 39(2), 438-458. doi: 10.1080/02673037.2022.2056153.
[44] Sabatino, E. (2022). The European defence fund: A step towards a single market for defence? *Journal of European Integration*, 44(1), 133-148. doi: 10.1080/07036337.2021.2011264.
[45] Santos, V.M., & Siman, M. (2022). Civil-military relations as a 'coordination problem'? Doctrine development and the multiple 'missions' of the Brazilian Armed Forces. *Critical Military Studies*, 10(2), 171-191. doi: 10.1080/23337486.2022.2047502.

[46] Shahini, E., Shebanina, O., Kormyshkin, I., Drobitko, A., & Chernyavskaya, N. (2024). Environmental consequences for the world of Russia's war against Ukraine. *International Journal of Environmental Studies*, 81(1), 463-474. doi: 10.1080/00207233.2024.2302745.
[47] The Department of National Defence supports the Canadian Armed Forces. (n.d.). Retrieved from https://www.canada.ca/en/department-national-defence.html.
[48] van Vark, A. (2021). Under pressure: Security and stability related challenges for liberal democracy in North-western Europe. *Democracy and Security*, 17(3), 296-323. doi: 10.1080/17419166.2021.1920930.
[49] Vignoli, V. (2024). Reluctant remilitarisation: Transforming the armed forces in Germany, Italy and Japan after the cold war. *Contemporary Italian Politics*, 16(3), 374-375. doi: 10.1080/23248823.2024.2368981.
[50] Vilks, A., Kipane, A., & Krivins, A. (2024). Preventing international threats in the context of improving the legal framework for national and regional security. *Social and Legal Studios*, 7(1), 97-105. doi: 10.32518/sals1.2024.97.
[51] Wenas Inkiriwang, F. (2020). 'Garuda shield' vs 'sharp knife': Operationalising Indonesia's defence diplomacy. *The Pacific Review*, 34(6), 871-900. doi: 10.1080/09512748.2020.1772352.
[52] Yatsiv, I., Pavlenchyk, N., Pavlenchyk, A., Krupa, V., & Yatsiv, S. (2024). Basic principles of corporate social responsibility management under martial law. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(1), 103-113. doi: 10.52566/msu-econ1.2024.103.

Кадрова політика та оборонна економіка: взаємозв'язок між ефективністю та витратами у збройних силах

Олег Семененко

Доктор військових наук, професор
Центральний науково-дослідний інститут Збройних Сил України
03049, просп. Повітряних Сил, 28Б, м. Київ, Україна
https://orcid.org/0000-0001-6477-3414

Юрій Клят

Кандидат технічних наук, доцент
Центральний науково-дослідний інститут Збройних Сил України
03049, просп. Повітряних Сил, 28Б, м. Київ, Україна
https://orcid.org/0000-0002-8267-3748

Віктор Царинник

Начальник відділу кадрового менеджменту та мобілізаційних досліджень
Центральний науково-дослідний інститут Збройних Сил України
03049, просп. Повітряних Сил, 28Б, м. Київ, Україна
https://orcid.org/0009-0003-8638-6353

Марія Ярмольчик

Доктор філософії, доцент
Національний авіаційний університет
03058, просп. Гузара Любомира, 1, м. Київ, Україна
https://orcid.org/0000-0001-9917-0189

Роберт Ованесян

Провідний науковий співробітник
Центральний науково-дослідний інститут Збройних Сил України
03049, просп. Повітряних Сил, 28Б, м. Київ, Україна
https://orcid.org/0009-0008-6761-2059

Анотація. Метою цього дослідження було вивчення впливу кадрової політики на економічну ефективність збройних сил з акцентом на оптимізацію витрат і боєготовність. У дослідженні проаналізовано моделі управління людськими ресурсами, включаючи набір за контрактом, довгострокове кадрове планування, короткострокові навчальні програми і ротацію, та їхній вплив на економічні показники збройних сил таких країн, як США, Велика Британія, Німеччина, Швеція, Канада, Австралія, Ізраїль, Франція, Італія, Іспанія, Індія, Румунія, Пакистан, Норвегія та Україна. Крім того, було проведено порівняльний аналіз оборонного сектору цих країн, з особливим акцентом на кадрову політику українського оборонного сектору. У дослідженні також було проведено SWOT-аналіз цих моделей, який допоміг оцінити їхні сильні та слабкі сторони, можливості та загрози для економічної ефективності оборонного сектору. Зокрема, контрактний набір забезпечує гнучкість у кадровому забезпеченні, але може призвести до низької лояльності персоналу, тоді як довгострокове кадрове планування сприяє стабільності, але вимагає значних інвестицій. Результати дослідження показали, що ефективне планування кар'єри, високі стандарти відбору персоналу, регулярне навчання та соціальна підтримка є ключовими факторами, які сприяють оптимізації витрат і стабільності персоналу. Крім того, інтеграція технологічної підготовки підвищує ефективність використання ресурсів та зменшує витрати на утримання. SWOT-аналіз показав, що гібридна модель, яка поєднує елементи різних підходів, забезпечує адаптивність у кризових ситуаціях, але вимагає ретельного управління через неоднорідність робочої сили. На основі отриманих результатів у дослідженні запропоновано рекомендації щодо оптимізації кадрової політики з метою підвищення економічної ефективності збройних сил, зокрема через гнучкі програми рекрутингу, використання цивільних фахівців на некритичних посадах та залучення резервістів для виконання допоміжних завдань у кризових умовах, з детальним аналізом їх імплементації в українському оборонному секторі. Отримані результати підтверджують, що збалансована кадрова політика дозволяє підтримувати боєготовність при одночасному зниженні загальних витрат на оборонний сектор

Ключові слова: військові ресурси; національна безпека; управління персоналом в армії; сектор безпеки; фінансування армії

Scientific Bulletin
of Mukachevo State University

Series
Economics

Volume 11, No. 4, 68-80
Journal homepage: https://economics-msu.com.ua/en

UDC 658.15:334.72
DOI: 10.52566/msu-econ4.2024.68

The impact of corporate governance and share capital structure on corporate social responsibility

Arta Hoti Arifaj
Doctor of Economics, Assistant Professor
AAB College
10000, 56 Elez Berisha Str., Pristina, Republic of Kosovo
https://orcid.org/0000-0001-7076-8072
Ilir Rexhepi
Doctor of Economics, Assistant Professor
AAB College
10000, 56 Elez Berisha Str., Pristina, Republic of Kosovo
https://orcid.org/0000-0003-0339-3180
Blerta Haliti Baruti*
Doctor of Economics, Assistant Professor
AAB College
10000, 56 Elez Berisha Str., Pristina, Republic of Kosovo
https://orcid.org/0000-0002-3977-7947

Abstract. The relevance of the study was driven by the importance of effective corporate governance for the implementation of corporate social responsibility, which is critical for ensuring business sustainability in the context of globalization and adaptation to European standards. How effectively companies implement management practices determines their ability to respond to social challenges and maintain investor confidence. The purpose of the study was to investigate the key aspects of the impact of corporate governance and shareholder capital structure on corporate social responsibility in the Western Balkans, including Kosovo, given the special challenges of transition economies and international support. The research methodology included a quantitative empirical analysis based on a structured survey among companies in various sectors of the Kosovo economy, which allowed assessing governance practices and corporate social responsibility. In addition, econometric methods were used to identify the impact of board independence and capital concentration on corporate social responsibility. The main results of the study indicated a significant positive impact of board independence on companies' social investments, in particular, due to increased management transparency

Received: 19.07.2024, Revised: 18.10.2024, Accepted: 27.12.2024

Suggested Citation: Arifaj, A.H., Rexhepi, I., & Baruti, B.H. (2024). The impact of corporate governance and share capital structure on corporate social responsibility. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 68-80. doi: 10.52566/msu-econ4.2024.68.

*Corresponding author

and reduced risks of corruption. It was found that companies with a distributed shareholding structure tend to engage in long-term social projects, while companies with high ownership concentration are more likely to focus on short-term initiatives. International partners, including the European Bank for Reconstruction and Development and the International Finance Corporation, play a pivotal role in ensuring transparent management standards, supporting Kosovo's integration into the global economic system. The study also showed that banks and energy companies in Kosovo are actively implementing environmental standards as an integral part of their corporate social responsibility strategies. The findings confirm the importance of balanced corporate governance and international support for the long-term sustainability of companies in the region

Keywords: social investment; sustainable development; long-term projects; independent directors; investors; business strategies

Introduction

Corporate governance and shareholder capital structure are key factors that determine not only the financial sustainability of companies, but also their ability to respond to social challenges. In the context of globalization at the beginning of the 21st century, these factors have become increasingly important as society, investors, and governments have begun to demand greater transparency and social responsibility from businesses. Effective governance and rational allocation of shareholder capital affect the ability of companies to achieve long-term goals, maintain social stability and meet stakeholder expectations. These issues are particularly relevant for countries in transition, particularly in the Western Balkans, where weak institutions and limited access to resources have a significant impact on business development. In the countries of this region, including Kosovo, the problems of corporate governance and ownership structure have become even more important after the conflict of the late 1990s. The need to adapt to European standards and restore social and economic stability has increased the importance of socially responsible business strategies. In this environment, companies with balanced management structures and rational capital allocation had a better chance of success (Kyfyak *et al*., 2024).

Corporate governance and shareholder capital structure are closely linked to corporate social responsibility (CSR). Many companies face challenges due to a lack of governance transparency and high levels of capital concentration. Large companies, especially those with one or more dominant shareholders, are often focused on short-term financial gains, which makes CSR implementation difficult (Yatsiv *et al*., 2024). In the Western Balkans, these challenges are exacerbated by underdeveloped institutional frameworks and political instability. Board independence and a balanced ownership structure are crucial factors for improving corporate governance and facilitating CSR implementation. Companies with more independent boards demonstrate higher levels of transparency and accountability, which allows them to better respond to social needs. At the same time, a high level of ownership concentration limits the ability to take into account the interests of minority shareholders and other stakeholders, which reduces the effectiveness of long-term social programmes and initiatives (Ponomarenko *et al*., 2014).

Over the past decade, several significant studies have been conducted on the interrelationship between corporate governance, shareholder capital structure and corporate social responsibility. For example, M. Ktit & B.A. Khalaf (2024) investigated the relationship between corporate governance, CSR and dividends in the European context, noting that more distributed ownership structures promote transparency and take into account the interests of a wide range of stakeholders. Their study showed that transparency and accountability in companies reduce the risk of conflicts between shareholders and stakeholders. N. Levkov & N. Palamidovska-Sterjadovska (2019) studied CSR communication in the banking industry in the Western Balkans, emphasizing the importance of transparency and accountability in corporate governance. They note that almost half of the banks in the region do not disclose information about their social responsibility on their websites, which indicates the need for increased transparency and accountability.

E. Elezaj *et al.* (2019) analysed the impact of CSR on the public interest in Kosovo, noting that companies with a dispersed ownership structure are more likely to engage in social initiatives. The study showed that CSR implementation helps to improve the image of companies and increase public trust, which is critical for post-conflict societies. I. Jetullahu (2020) proposed a new model for improving the financial performance of large enterprises through the implementation of CSR in Kosovo. The author argued that the integration of socially responsible practices can be a key factor in increasing the competitiveness and sustainability of business in an unstable economy. L.O. Cezarino *et al.* (2022) examined the opportunities and challenges of integrating sustainability into CSR in emerging markets, emphasizing the role of corporate governance. They note that companies in developing countries face unique challenges in implementing sustainable practices, including limited access to resources and insufficient government support. F. Tafolli & S. Grabner-Kräuter (2020) investigated employees' perceptions of CSR and organizational corruption in Kosovo, finding that board independence contributes to a reduction in corruption. They highlight that transparent and accountable governance structures can increase employee trust and reduce the likelihood of unethical behaviour in organizations.

T. Dinh *et al.* (2022) conducted a review of corporate sustainability reporting in Europe, emphasizing the importance of transparency in governance. They found that companies with more transparent reporting practices have a higher level of trust from investors and other stakeholders, which contributes to their long-term success. G.K. Ariyo (2023) analysed the best practices of corporate governance and CSR, noting that a balanced ownership structure promotes the social responsibility of companies. The author emphasizes that companies with a more diversified ownership structure are more likely to implement socially responsible initiatives, as they take into account the interests of a wider range of stakeholders.

Despite some progress in the study of the impact of corporate governance and ownership structure on corporate social responsibility (CSR), the Western Balkans region, and Kosovo in particular, remains under-researched. Most previous studies have focused on developed countries such as the US, UK, Germany and Japan, while the impact of these factors in transition economies remains unexplored. This study aimed to identify the main factors influencing socially responsible decision-making in the Western Balkans, particularly in Kosovo, and to assess how corporate governance and shareholder capital structure affect the development of CSR in the region. The objectives of the study were also to:

1. Assessing the impact of board independence on companies' socially responsible decision-making.
2. Investigating how shareholder concentration affects companies' investments in social and environmental initiatives.
3. Identifying the key regional features of corporate governance in the Western Balkans that contribute to the development of corporate social responsibility.

Materials and Methods

This study is a quantitative empirical analysis aimed at examining the impact of corporate governance and corporate social responsibility in the Western Balkans, including Kosovo. The timeframe of the study covers the period from 2010 to 2023, which allows us to assess the dynamics of changes in corporate behaviour after the implementation of key reforms in the region. This timeframe was chosen to analyse the long-term effects of adaptation to European standards of transparency and responsibility.

The data for this study was collected through a structured survey that covered companies in various sectors of the Kosovo economy, including banking, energy, telecommunications, logistics, and retail. The sample consisted of 150 companies, of which 60% were SMEs and 40% were large companies with international investments. The survey included leading companies such as ProCredit Bank (2024), Raiffeisen Bank Kosovo (2024), Kosovo Energy Corporation (KEC) (2024), Post and Telecom of Kosovo (PTK) (2024) and Telekom Srbija (2024). In addition to the survey, additional data were obtained from the companies' annual reports, official publications of international organizations such as the European Bank for Reconstruction and Development (EBRD), the International Finance Corporation (IFC) (Rappai, 2024), the World Bank (2022), the United Nations Development Programme (2023) and open sources on their official websites.

A number of econometric methods were used to analyse the collected data. The main method used was descriptive statistical analysis, which allowed us to identify general trends and estimate average values in the context of CSR for different sectors of the economy. This method helped to identify basic patterns of corporate social responsibility, in particular among enterprises with foreign investments compared to local companies. Additionally, correlation analysis was applied to identify links between corporate governance structure (factors such as board independence) and the level of social investment. This method allowed us to assess the extent to which the implementation of governance transparency principles is related to the responsibility of companies in social and environmental issues. Regression analysis was also used to assess the statistical significance of the impact of independent variables, such as shareholder concentration and the level of transparency of management decisions, on the level of corporate social responsibility.

The interpretation of the results was based on a comparison with previous studies in the field of corporate governance and CSR, in particular, specific factors characteristic of the Western Balkans were taken into account. The interpretation of the results also included an analysis of regional challenges, such as political instability, low level of institutional development and the impact of European integration on companies' management strategies. Comparison of the results with global trends allowed us to draw conclusions about the unique features of corporate governance in Kosovo.

Results

The impact of board independence on the level of corporate social responsibility

Board independence is one of the key conditions for effective implementation of corporate social responsibility (CSR). The radical difference between companies with independent boards and those dominated by large shareholders or top management is the level of accountability and transparency that independent directors provide. When a board of directors is composed of independent members who have no direct financial or personal interest in the company's business, they can make more objective and impartial decisions. Independent directors act as "outside observers", which allows them to avoid conflicts of interest and focus on the company's long-term goals, such as social and environmental standards, rather than just profit maximization. Their role is especially important when a company is trying to meet the interests of not only shareholders but also a wide range of stakeholders.

One of the most visible impacts of board independence is the promotion of increased investment in social projects.

According to a study, companies with more than 30% independent directors invested on average 30% more in CSR than companies with less independent boards (Fig. 1). This is because independent directors are less susceptible to the influence of shareholders and top managers focused on short-term financial gains and are able to make decisions that take into account the interests of communities and social needs. In this way, they strike a balance between the company's economic and social goals, contributing to the achievement of sustainable development.

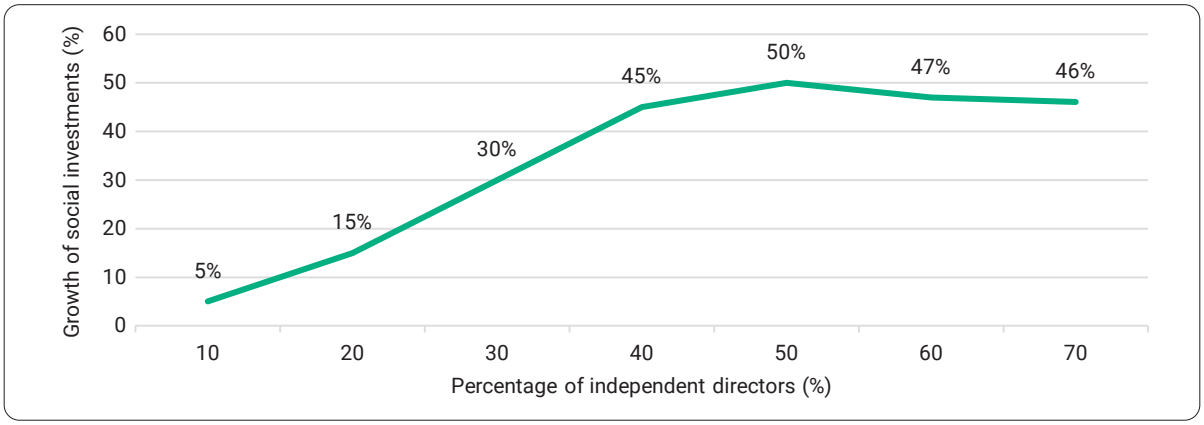

Figure 1. The non-linear impact of board independence on the growth of social investment
Source: created by the authors

The regression analysis conducted as part of the study also showed that a 10% increase in the share of independent directors correlates with a 15% increase in spending on social projects. However, this relationship is non-linear, as the maximum effect is achieved when the share of independent directors is between 30% and 50%. This means that at a certain point, an increase in board independence does not lead to a proportional increase in social investment. The importance of achieving the optimal level of independence underlines the need for a careful approach to the formation of boards of directors to promote CSR.

Independent boards also have a direct impact on a company's overall CSR strategy, particularly with regard to environmental initiatives. Many energy companies with independent directors on their boards have seen more ambitious targets for reducing carbon emissions and using renewable energy sources (Chang *et al*., 2023). Such projects allow companies not only to gain reputational benefits, but also to achieve long-term savings by reducing energy costs. It also serves as an example of how independent directors with diverse industry expertise can help companies implement innovative approaches to addressing social and environmental challenges. Independent directors also play an important role in ensuring accountability and transparency of companies. They control expenditures on social programmes and promote the implementation of clear CSR reporting mechanisms. According to a study by M.C. Pucheta-Martínez & I. Gallego-Álvarez (2018), companies with independent boards of directors demonstrate higher levels of transparency in their social project reports, which increases the trust of investors and international partners. Transparency in reports allows stakeholders to better understand how financial resources are used for social and environmental initiatives, which has a positive impact on the company's reputation (Kryukova *et al*., 2023).

Another aspect of the impact of board independence is the involvement of various social programmes that take into account the needs of the community. Studies have shown that companies with a high level of board independence are more likely to initiate programmes in the areas of healthcare, education, equality, and the environment. This is due to the fact that independent directors have more diverse experience and expertise, which allows them to develop social initiatives aimed at addressing pressing social issues. Such initiatives improve the company's interaction with the community and build trust in its activities. Another important role of independent directors is to mitigate corporate reputational risks. Companies that implement transparent and responsible social strategies under the supervision of independent directors reduce the risk of damage to their reputation in the event of social or environmental crises (Lagotyuk, 2023). Independent directors ensure that the company's actions comply with international CSR standards, which also helps to attract foreign investors and partners focused on sustainability and business transparency. It is also important that independent boards of directors increase the competitiveness of companies in the international market. Companies with independent boards are better able to meet global standards of social responsibility, which allows them to attract more international partners and investors (Nicolás-Salas & Lorente, 2024). The study confirmed that companies with independent boards received more international investment due to their transparent CSR policies, which in turn improved their reputation and integration into global markets.

Board independence is a critical condition for the effective implementation of corporate social responsibility. It ensures accountability, transparency, and the ability to

make decisions that take into account the interests of not only shareholders but also wider social groups. Companies with independent boards of directors not only allocate more funds to social initiatives, but also do so more effectively and strategically. The impact of independence on the level of CSR is obvious and contributes to the long-term social and environmental sustainability of the business.

The impact of shareholder concentration on companies' social investments

Shareholder concentration is one of the most important factors influencing companies' decisions on social investment and CSR implementation. Companies with a high concentration of capital, where the majority of shares are held by a few investors, often tend to focus on short-term financial gains and pay less attention to long-term social initiatives. This is because large shareholders often prioritize short-term profit growth and may not always consider social spending to be worthwhile. On the contrary, companies with a more distributed ownership structure are more likely to invest in CSR as they seek to satisfy a wider range of stakeholders.

Research shows that companies with a major shareholder owning more than 60% of the shares typically have 35% less CSR investment than companies with a major shareholder of around 20-40%. This difference is significant, as it indicates that excessive concentration of capital creates barriers to effective CSR implementation. The concentration of shares in the hands of one or more shareholders can lead to the fact that the interests of a small group of investors begin to dominate the overall goals of the company. This, in turn, limits opportunities for social investment, as priority is given to quick financial results (Zahid *et al.*, 2023). On the other hand, companies with a distributed shareholding structure often show more interest in social initiatives. Such companies have a wide range of stakeholders, including smaller investors, the public and other stakeholders who value social responsibility and long-term development. This creates motivation for the company to implement social projects, which has a positive impact on the company's reputation and its interaction with the community. Distributed ownership also helps to reduce pressure from large shareholders, allowing companies to make more balanced and long-term CSR investments.

According to the regression analysis conducted as part of this study, companies with a capital concentration level of 20-40% are most likely to demonstrate the highest level of social activity (Fig. 2). The correlation coefficient between the level of share dispersion and the number of social projects showed a value of 0.65, indicating a significant relationship between these indicators. Companies with a moderate level of capital concentration not only invest more in social programmes, but also more often implement initiatives that meet international CSR standards.

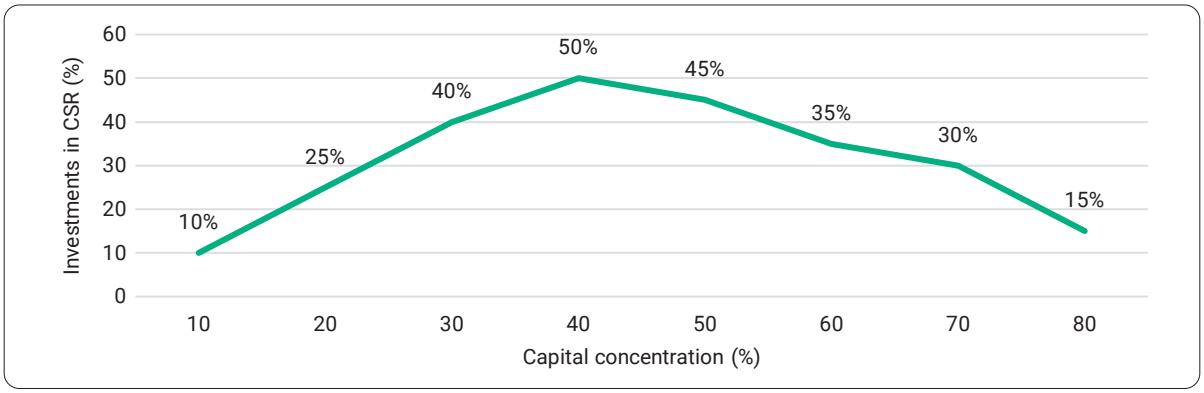

Figure 2. Impact of capital concentration on CSR investments

Source: created by the authors

Ownership concentration also affects the type of social initiatives implemented by a company. For example, companies with a high level of capital concentration tend to limit their social initiatives to short-term charitable projects that do not require significant investments or long-term commitments. In contrast, companies with a more dispersed shareholder structure initiate long-term projects in education, healthcare, and the environment. This is due to the fact that smaller shareholders are usually more focused on sustainable development and support for local communities, which contributes to the company's social responsibility (Ponomarenko & Pysarchuk, 2024). Another important aspect is the impact of capital concentration on CSR transparency and accountability. Companies with a distributed shareholder structure are more likely to publish detailed reports on their social initiatives and environmental responsibility, as this allows them to maintain the trust of multiple stakeholders. Such transparency has a positive impact on the company's reputation, as the public and investors can see the real results of social projects. In contrast, companies with a high level of concentration of ownership may have less detailed CSR reporting, which can negatively affect the level of public trust.

Companies with a low level of shareholder concentration demonstrate a higher level of transparency in CSR issues, which increases the level of trust from consumers

and investors (Andreu-Guerrero & Rienda-Garcia, 2023). For such companies, social responsibility becomes an important element of their strategy, helping them to attract international partners and investors focused on sustainable development. This, in turn, has a positive impact on the company's financial performance, making it attractive to long-term investors. In contrast, companies with a major shareholder's share of more than 60% are dominated by short-term projects that can provide quick returns but have limited social impact. This is due to the fact that large shareholders are usually focused on increasing shareholder value and receiving dividends in the short term. Such projects include charity events and sponsorship programmes, which, although they help to enhance the company's image, do not provide a sustainable impact on society and long-term social benefits.

The analysis showed that capital concentration affects the approach to environmental initiatives. Companies with a low level of ownership concentration are more likely to implement projects related to waste recycling, carbon emissions reduction and the use of renewable energy sources (Dovgal *et al*., 2024). These companies are more focused on environmental sustainability and sustainable development, as their stakeholders include a wide range of stakeholders who support environmentally responsible business. Companies with a high concentration of ownership are less likely to initiate environmental projects, as such initiatives usually require significant investments and do not bring quick financial returns. In summary, the level of shareholder concentration is an important factor that determines a company's approach to corporate social responsibility. Companies with a distributed ownership structure are more likely to implement social and environmental initiatives that promote sustainable development and a positive impact on the community. In contrast, companies with a high concentration of ownership are usually limited to short-term projects focused on quick gains.

Regional peculiarities of corporate governance and their impact on CSR in the Western Balkans

Corporate governance in the Western Balkans has unique features that have been shaped by the post-socialist legacy and adaptation to modern European standards. The economies of the region, including Kosovo, have moved from a centralized to a market-based model of governance, which has become a particular challenge for local companies. Since the early 1990s, the integration of Western principles of transparency and accountability has been actively supported by international organizations and the European Union, which promote the implementation of good governance standards necessary to attract foreign investment. The region has seen a gradual increase in attention to corporate social responsibility (CSR) as an important element of sustainable development.

After the 2000s, the countries of the Western Balkans, including Kosovo, stepped up their efforts to integrate into the European economic system by implementing reforms aimed at transitioning from centrally controlled to market economies. One of the key mechanisms of adaptation was the adoption of Western standards of transparency and accountability, which is a prerequisite for attracting foreign investment. In the case of Kosovo, programmes supported by the EU and other international organizations aimed at creating an effective institutional framework played a significant role in this process. For example, the EU's Western Balkans Programme helps the region's states implement regulatory and administrative reforms that meet EU accession criteria, particularly in terms of corporate governance and financial transparency.

Kosovo, one of the youngest independent states in Europe, faces particular challenges in the area of corporate governance. Since gaining independence in 2008, the country has embarked on a process of establishing new institutions, and economic reconstruction has become a national policy priority. The international community, including organizations such as the European Bank for Reconstruction and Development (EBRD), United States Agency for International Development (USAID) and the World Bank (2022), has been actively supporting Kosovo with financial and technical assistance for private sector development. These programmes promote transparent practices and corporate governance, and lay the groundwork for CSR as an integral part of business. In the period from 2010 to 2023, there was a gradual evolution of corporate behaviour in the area of corporate social responsibility and governance transparency in Kosovo (Table 1).

Table 1. Dynamics of changes in corporate behaviour in Kosovo (2010-2023)

Period	Key changes in corporate behaviour
2010-2012	Start of CSR implementation in the context of economic recovery after the crisis and support from international organizations. Limited access to investment, low level of transparency.
2013-2015	Increased focus on board independence and transparency of reporting. Some companies are starting to implement their first social projects with the support of donors.
2016-2018	Intensification of environmental initiatives and implementation of ESG standards in large enterprises (energy, banks). Increased transparency in reports due to the requirements of international partners.
2019-2021	Expanding corporate social responsibility to include regional initiatives aimed at education and healthcare. Companies with a distributed ownership structure are more likely to invest in long-term social projects.
2022-2023	Integrating more comprehensive ESG strategies; focusing on environmental sustainability and attracting foreign capital through compliance with European standards. Increased support for local communities and social initiatives.

Source: created by the authors

At the beginning of the analysed period, companies demonstrated limited transparency in their corporate processes and were characterized by a low level of institutional development. This situation contributed to a predominant focus on short-term financial results without due attention to social or environmental initiatives. The high level of shareholder concentration resulted in the minimization of minority shareholders' interests, which limited opportunities for social investments. Starting in 2013, as support from international organizations such as the European Bank for Reconstruction and Development (EBRD) and the International Finance Corporation (IFC) (Rappai, 2024) grew, companies began to pay more attention to board independence. This has helped to increase accountability and ensure that decisions are made in favour of social initiatives. Initiatives that supported transparency and responsibility in corporate governance received more support among companies with different shareholder structures.

In 2016-2018, some industries, including energy and banking, began to actively implement environmental standards, including emissions reduction and energy efficiency, as part of their ESG strategies. These initiatives have been supported by international financial institutions, which has contributed to the integration of sustainability principles and increased transparency in reporting. Companies with a distributed ownership structure were more likely to invest in long-term social projects aimed at supporting local communities and addressing environmental issues, which helped to establish a new level of interaction with local stakeholders. Since 2019, there has been an expansion of CSR strategies focused on supporting local communities, health and education initiatives, and inclusive practices. More and more companies in the region have integrated approaches to corporate social responsibility with a focus on long-term sustainability. By the end of the study period, in 2023, most of the region's large companies had adapted to European ESG standards, which helped to attract foreign investment and maintain stable development in a challenging political and economic environment.

Kosovo's largest state-owned companies, such as Kosovo Energy Corporation (KEC) (2024) and Post and Telecom of Kosovo (PTK) (2024), are a particular example of positive changes in governance. Thanks to technical and financial assistance from international donors, these companies have begun to integrate corporate governance standards and implement an accountability system. In cooperation with the EBRD, KEC and PTK are striving to meet high standards of transparency, which is a prerequisite for sustainable development and long-term investment. This approach is gradually changing the overall level of trust in the public sector and promoting CSR in the country. Kosovo receives significant support for the development of transparency in governance from international organizations such as the EBRD, IFC and the World Bank (2022). One of the key programmes is the EBRD's Supporting SME Growth initiative, which facilitates access to financial and advisory services for small and medium-sized enterprises, helping them to adapt to international standards. In the energy sector, the EBRD has an Energy Efficiency Investment Programme aimed at attracting investment to modernize energy infrastructure. These programmes not only improve management standards, but also create an environment for socially responsible practices, increasing accountability. International organizations play an important role in the development of corporate governance in Kosovo, creating an environment for transparent business processes. Programmes implemented by the EBRD, IFC and the World Bank are aimed at supporting governance reforms and ensuring proper accountability. For example, the IFC provides advice and financial support to small and medium-sized businesses, enabling them to adapt to international standards and establish responsible corporate governance mechanisms. Such efforts encourage companies to implement CSR strategies, especially in the environmental and social spheres.

The involvement of international partners contributes to the implementation of environmental, social and governance (ESG) standards in Kosovo. With the support of the EU4Environment programme, the EU is funding projects aimed at decarbonization, sustainable waste management and the development of environmental infrastructure. Kosovo, like other countries in the Western Balkans, is striving to meet European ESG standards, which is becoming the basis for long-term investments (Lazaj *et al.*, 2024). For example, EU-supported energy efficiency projects are helping large enterprises reduce emissions, cutting costs and improving environmental performance. In the area of CSR, EU support also provides training for local entrepreneurs, guiding them towards socially responsible investments.

An important element of corporate governance in Kosovo is the maintenance of environmental, social and governance (ESG) standards with the help of international partners. These standards form the basis for long-term investment in sustainable development, which is particularly important for attracting foreign capital. The European Union and other international donors have allocated significant funds for the implementation of ESG standards, helping Kosovo to achieve European standards in the field of sustainable development and social responsibility. This funding is directed to projects such as reducing emissions in the industrial sector, improving energy efficiency, sustainable waste management and supporting local entrepreneurs in implementing environmental practices. Such initiatives not only contribute to the country's environmental and social development, but also increase its attractiveness to international investors who value companies' compliance with international ESG standards. According to the Giving Kosovo (2023), the corporate sector was an important factor in the Kosovo philanthropic ecosystem. From 2018 to 2022, companies donated more than EUR 3.4 million to the common good and sustainable development of the country (Fig. 3).

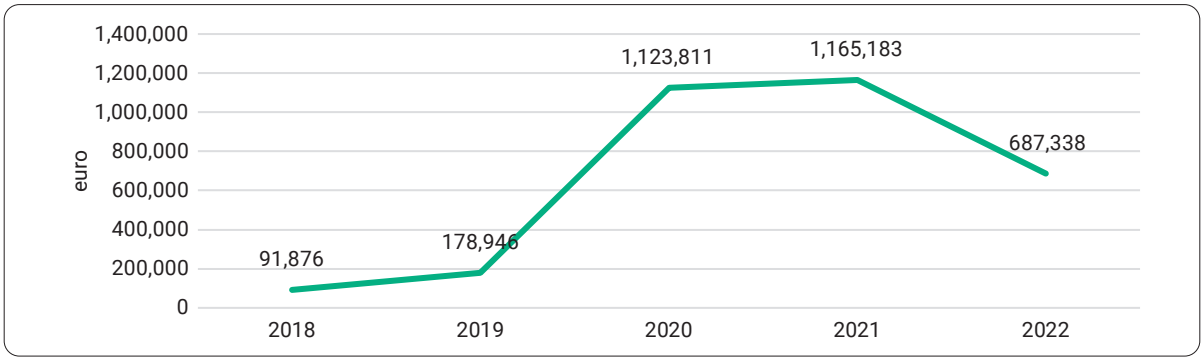

Figure 3. Trend in donations by corporate companies in Kosovo
Source: created by the authors based on Giving Kosovo (2023)

Grants and investments from the EU play an important role in supporting local businesses in their CSR efforts. These resources are used to implement social and environmental initiatives, as well as to strengthen the institutional structures necessary for sustainable development. The EU supports training and professional development programmes for local professionals, which contributes to the transfer of best practices and the improvement of corporate governance in Kosovo. Political changes in the country also have a significant impact on the ability of businesses to implement long-term CSR projects.

The unstable political environment forces companies to reassess their investments and CSR strategies, which in the long run affects their sustainability. As a result, companies in Kosovo need to maintain flexibility in their strategies to adapt to the ever-changing environment. The development of independent boards of directors is an important element of corporate governance in Kosovo, which allows for greater transparency and accountability. The introduction of independent boards is a prerequisite for many companies seeking to meet international standards, which increases the level of trust in them by investors and the public. This approach also helps to create effective management structures that can meet the challenges of the modern market. Frequent changes in political policies create additional risks for the implementation of long-term corporate social responsibility projects, especially for state-owned enterprises. In such an environment, international partners such as USAID and the World Bank (2022) recommend that companies maintain flexibility in their CSR strategies to quickly adapt to political changes. These recommendations are important as they help to avoid interruptions in social and environmental programmes. The Kosovo Chamber of Commerce and Industry is a key platform for promoting transparency among SMEs. The Chamber of Commerce and Industry provides advice to local businesses with the support of international experts, which helps to expand CSR practices and improve corporate culture.

The implementation of CSR and corporate governance in different sectors of the Kosovo economy has its own specifics. The banking sector in Kosovo is a leader in modern corporate governance and CSR practices. ProCredit Bank (2024), for example, is actively implementing environmentally responsible initiatives, including the introduction of "Green Loans" (ECO loans), which are loan products designed for investments in energy efficiency and other environmentally friendly initiatives. Similarly, Raiffeisen Bank Kosovo (2024) has relevant financing programmes for companies that wish to comply with the EU Taxonomy and contribute to a positive impact on the environment and social environment. This not only increases confidence in the banking system, but also sets an example for other companies in the region. The banking sector demonstrates a high level of accountability and transparency aimed at building trust in financial institutions. The energy sector is focusing on environmental initiatives, including decarbonization and infrastructure modernization (Murtezaj *et al*., 2024). Kosovo Energy Corporation (KEC) (2024), with the support of the EBRD, is implementing infrastructure modernization projects aimed at reducing CO_2 emissions as part of its long-term ESG strategy to ensure sustainable development. In 2024, the company launched the Energy for Equality project, an initiative to empower women in the energy sector in Kosovo, which aims to increase educational opportunities and provide technical assistance and grants to employers in this area. The company also launched the Greening for the Future project, where former coal mines will be redeveloped and a public park created (Kosovo – project…, 2020). Information technology is rapidly developing, offering opportunities for digitalisation and innovation. In agriculture, corporate social responsibility is gaining importance through the introduction of sustainable production methods. Support for local farmers and the development of organic farming are key to ensuring food security and supporting rural areas. It also contributes to the development of local communities by creating stable socio-economic structures. The logistics sector in Kosovo is also gradually adopting the principles of sustainable development, in particular through the optimization of transport routes. Local companies are increasingly turning to environmentally responsible solutions, which helps to reduce operating costs and increase efficiency. Foreign investors, such as Deutsche Post and DHL, are attracted to the country, and international

standards are being introduced in logistics operations. This helps to increase the industry's competitiveness while supporting sustainable development.

Kosovo's telecoms industry is focused on supporting inclusivity and cybersecurity, attracting investment from major international players. Groups such as Telekom Srbija (2024) are implementing the latest technologies, facilitating the availability of services for different social groups. These companies are also actively developing social initiatives aimed at improving digital skills and providing access to the Internet in rural areas. This increases the level of inclusiveness and digital literacy, contributing to the development of modern society. The healthcare and pharmaceutical industry in Kosovo is demonstrating a growing level of corporate responsibility. Local pharmaceutical companies and medical institutions are actively implementing quality standards and supporting social programmes to improve access to healthcare services. With the support of international donors, they are also implementing occupational health and safety and disease prevention programmes, which contribute to the improvement of the population's health. This has a positive impact on the quality of life and develops the healthcare system. The retail sector in Kosovo is also focusing on implementing corporate social responsibility standards, supporting local producers and promoting sustainable consumption. Some large retail chains are integrating initiatives to reduce waste and reduce their environmental footprint. In addition, companies in the retail sector are focusing on social programmes, including support for educational and cultural projects, which enhances their reputation and strengthens their ties with local communities. Overall, Kosovo has demonstrated significant progress in corporate governance and CSR thanks to the active support of international partners and the efforts of local companies. Despite existing challenges, especially those related to political instability, Kosovo is moving towards setting standards of transparency, accountability and sustainable development. The implementation of good governance practices and socially responsible strategies is an important element of Kosovo's integration into the international economic space, which also contributes to its attractiveness to investors.

Discussion

The study confirms that board independence and shareholder concentration have a significant impact on the level of corporate social responsibility (CSR) in the Western Balkans. In particular, the results show that companies with independent boards of directors have more opportunities for strategic social investments, while highly concentrated ownership structures often limit these initiatives. This is consistent with the findings of J. Harford *et al.* (2007), who noted that independent boards promote accountability, creating better conditions for sustainable development. D.A. Carter *et al.* (2003) also emphasized that diversified boards can more effectively influence the achievement of long-term goals of the company.

International experience, in particular in the European context, demonstrates the additional benefits of board independence in supporting socially responsible initiatives (Kalyuzhna *et al*., 2024). For example, G. Michelon *et al.* (2019) studied how social movements and activists can influence CSR disclosure in European companies, confirming the importance of transparency in building stakeholder trust. This is in line with findings that highlight that independent boards contribute to the development of socially responsible corporate policies, especially in emerging regions. The study by S. Setyaningsih *et al.* (2024) indicated that independence in decision-making promotes transparency and increases public trust. The study notes that small businesses often face additional challenges due to limited resources to implement transparent practices. This confirms the findings that companies with independent boards of directors are better able to integrate CSR principles, although they need external support to effectively implement strategies in volatile markets. Paper C.G. Ntim & T. Soobaroyen (2013) pointed to a decrease in conflicts between shareholders and stakeholders in companies with transparent corporate governance practices. Their results confirm that independent boards of directors help to avoid conflicts of interest, which contributes to the sustainable development of companies. However, in the Western Balkans, political and economic instability may affect the effectiveness of this approach.

The study by I. Khan *et al*. (2022) emphasized the importance of sustainability management, which positively affects companies' environmental, social and governance performance. This confirms that the independence of boards in the Western Balkans can stimulate environmentally and socially responsible projects, although the implementation of such initiatives depends on the support of international partners such as the EBRD. Another study conducted by A. Shaukat *et al.* (2015) proved that board diversity has a positive impact on a company's CSR strategy. They emphasize that companies that focus on board diversity and independence have better transparency scores, which contributes to sustainable development. These findings confirm that independent boards are an important factor in achieving the socially responsible goals of companies in emerging markets. M.C. Pucheta-Martínez & I. Gallego-Álvarez (2018) emphasized that independent directors on company boards significantly affect the disclosure of information on social initiatives and environmental standards. These findings confirm that independence and transparency in corporate governance are key conditions for effective CSR integration, which is consistent with the findings of this study.

T. Nawaz (2017) and I. Kartallozi & V. Xhemajli (2017) investigated the impact of human capital and corporate governance on the performance of Islamic banks, finding that effective governance promotes social investment. The author points out that investments in human capital and good corporate governance mechanisms have a positive impact

on the market value of banks, especially after the financial crisis. The findings are consistent with this study that appropriate investments have a positive impact on the overall performance and efficiency of companies. I. Ibrahim *et al.* (2023) investigated the relationship between CSR, financial performance and innovation processes within corporations. They found that companies that are actively engaged in CSR often achieve strong financial performance through innovation. The results of this study support the conclusion that transparency and independence of boards of directors create favourable conditions for innovation, which in turn stimulates financial development and sustainability of companies. However, the results are particularly relevant to emerging markets, where the lack of institutional development may create obstacles to the implementation of innovative practices. G. Dallas & D. Pitt-Watson (2016) emphasized the positive impact of board transparency and independence on investor and public confidence. Their study confirms the importance of increased transparency for long-term performance, which is particularly relevant in the context of the Western Balkans. A study by S. Boubaker & D.K. Nguyen (2014) also demonstrated that corporate governance in European markets is positively correlated with the involvement of independent boards of directors, which contributes to increased transparency and sustainability of companies.

Study I. García-Sánchez & E. García-Meca (2018) highlighted those talented managers in companies with effective corporate governance mechanisms achieve significantly better results, including through increased efficiency of CSR investments. These findings confirm that transparency and independence on boards of directors allow for better planning of social and environmental initiatives, especially in regions with unstable economies where a focus on long-term sustainability is a necessity. M.H. Shahrour (2024), who studied current trends in corporate governance, draws attention to the importance of board independence in achieving ESG goals in a global context. Its findings support the idea that transparency and accountability are key to implementing long-term socially responsible strategies. This is in line with our findings, where governance transparency in Western Balkan companies showed a significant positive impact on social initiatives, despite some regional challenges. In a study by K.K. Rao & C. Tilt (2020), while focusing on Australia, also emphasizes the importance of board composition in CSR decision-making. Their analysis shows that the gender and professional composition of the board influences social responsibility strategies, which is useful for the European context. Similar conclusions can be drawn for the Western Balkans, where gender diversity and board independence can help to adapt CSR strategies to local needs. The work of P. Velte (2019), who presented a meta-analysis, highlighted that board composition has a direct impact on the level of transparency of CSR reporting in European companies. This confirms that board independence contributes to a transparent and accountable approach to social initiatives, which is especially important in the context of companies in transition economies in the Western Balkans.

Summarizing the findings and comparing them with international studies shows that independent boards of directors are universally important for effective CSR implementation in different regional contexts. However, for the Western Balkans, with its specific economic and political conditions, the importance of transparency in governance is particularly important. Independent boards help companies to implement socially responsible strategies, even in the face of economic obstacles and political instability. Thus, the results of the study confirm that board independence and corporate governance transparency are crucial factors for the development of CSR in the Western Balkans. Further initiatives, such as attracting support from international organizations such as the EBRD and IFC, could help to increase the level of transparency and responsibility in corporate governance in the region.

Conclusions

The study demonstrated that board independence plays a key role in increasing the level of corporate social responsibility in companies in Kosovo and the Western Balkans. Companies with more than 30% of independent directors invested an average of 30% more in social projects compared to companies with a lower proportion of independent board members. The analysis also showed that a 10% increase in the proportion of independent directors correlated with a 15% increase in investment in social initiatives. In particular, in the energy sector, companies with independent boards of directors have set targets to reduce emissions and improve energy efficiency, which indicates increased environmental responsibility. Companies with a distributed ownership structure, where no single shareholder owned more than 40% of the capital, were more likely to make long-term social investments, spending on average 25% more than companies with a high concentration of shareholder capital. The region also saw a gradual increase in the integration of ESG standards, especially in the banking and energy sectors, which led to the implementation of decarbonization and renewable energy projects.

A special emphasis is placed on the impact of governance transparency in the unstable political environment of Kosovo. Frequent political changes pose additional challenges for companies, forcing them to adapt their CSR strategies to the changing environment. In such an environment, attracting the support of international partners such as the EBRD and the World Bank is critical for long-term investment. Kosovo has demonstrated that state-owned enterprises working with international donors, such as KEC and PTK, have been able to improve their reputation and support sustainable development. Banking institutions, such as ProCredit Bank, also play an important role in the development of CSR in the region, demonstrating a high level of accountability and active social engagement.

The development of independent boards of directors allows companies in Kosovo to better manage risks and

respond to the challenges of a transitional economy. It is also important to develop environmentally oriented initiatives, such as KEC's, that support sustainable development and modernization. Further implementation of transparent management practices, combined with adaptation to international ESG standards, will help attract foreign capital and increase the competitiveness of Kosovo's companies internationally. The introduction of structured governance in logistics, pharmaceutical, and telecommunications companies could be the next step to support inclusive development and innovation in the region. For future research, it is recommended to examine in more detail the impact of independent boards of directors on innovation and foreign capital attraction, as well as to investigate the long-term impact of international ESG standards on sustainable development in transition economies. Such an approach could contribute to a deeper understanding of effective governance strategies for the Western Balkans region and help companies better integrate into the European business environment.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Andreu-Guerrero, R., & Rienda-Garcia, L. (2023). Asset-light strategies and Spanish hotel chains' internationalisation: The moderating effect of family involvement in the firm. *Journal of Tourism Analysis*, 30(1), 1-27. doi: 10.53596/jta.v30i1.410.

[2] Ariyo, G.K. (2023). Corporate governance and corporate social responsibility: Good practices and prospects. *Texila International Journal of Management*, 9(2), 87-99. doi: 10.21522/tijmg.2015.09.02.art008.

[3] Boubaker, S., & Nguyen, D.K. (2014). *Corporate governance in emerging markets: Theories, practices and cases*. Heidelberg: Springer. doi: 10.1007/978-3-642-44955-0.

[4] Carter, D.A., Simkins, B.J., & Simpson, W.G. (2003). Corporate governance, board diversity, and firm value. *Financial Review*, 38(1), 33-53. doi: 10.1111/1540-6288.00034.

[5] Cezarino, L.O., Liboni, L.B., Hunter, T., Pacheco, L.M., & Martins, F.P. (2022). Corporate social responsibility in emerging markets: Opportunities and challenges for sustainability integration. *Journal of Cleaner Production*, 362, article number 132224. doi: 10.1016/j.jclepro.2022.132224.

[6] Chang, W., Yin, S., Yu, M., Teymurova, V., & Balabeyova, N. (2023). Impact of innovation on Corporate Social Responsibility: Evidence from China. *Economic Analysis and Policy*, 78, 1185-1194. doi: 10.1016/j.eap.2023.04.018.

[7] Dallas, G., & Pitt-Watson, D. (2016). *Corporate governance policy in the European Union*. Retrieved from https://ec.europa.eu/newsroom/just/redirection/document/45773.

[8] Dinh, T., Husmann, A., & Melloni, G. (2022). Corporate sustainability reporting in Europe: A scoping review. *Accounting in Europe*, 20(1), 1-29. doi: 10.1080/17449480.2022.2149345.

[9] Dovgal, O., Potryvaieva, N., Bilichenko, O., Kuzoma, V., & Borko, T. (2024). Agricultural sector circular economy development: Agroecological approach. *Ekonomika APK*, 31(4), 10-22. doi: 10.32317/ekon.apk/4.2024.10.

[10] Elezaj, E., Morina, D., & Draga, E. (2019). The impact of corporate social responsibility, In the society interest "Kosovo case". *Knowledge International Journal*, 34(1), 249-254. doi: 10.35120/kij34010249e.

[11] García-Sánchez, I., & García-Meca, E. (2018). Do talented managers invest more efficiently? The moderating role of corporate governance mechanisms. *Corporate Governance an International Review*, 26(4), 238-254. doi: 10.1111/corg.12233.

[12] Giving Kosovo. (2023). *Report on the state of philanthropy short-term vs. long-term giving*. Retrieved from http://surl.li/qdtiel.

[13] Harford, J., Mansi, S.A., & Maxwell, W.F. (2007). Corporate governance and firm cash holdings in the US. *Journal of Financial Economics*, 87(3), 535-555. doi: 10.1016/j.jfineco.2007.04.002.

[14] Ibrahim, I., Makaryanawati, M., & Juliardi, D. (2023). Corporate social responsibility and firm financial performance: The mediating role of firm innovation. *International Journal of Business, Law, and Education*, 4(2), 766-781. doi: 10.56442/ijble.v4i2.243.

[15] Jetullahu, I. (2020). *Corporate social responsibility – introducing a new model for improving the financial performance of large enterprises: The case of Kosovo*. Retrieved from https://typeset.io/pdf/corporate-social-responsibility-introducing-a-new-model-for-2yzgxwiyzd.pdf.

[16] Kalyuzhna, N., Smutchak, Z., Chorna, N., Chornyi, R., Baldyniuk, O., & Chuba, R. (2024). Toolkit for multi-vector adaptation and development of corporate culture of international companies. *Lecture Notes in Networks and Systems*, 927, 501-514. doi: 10.1007/978-3-031-54009-7_45.

[17] Kartallozi, I., & Xhemajli, V. (2017). *The rise of future leaders: Social entrepreneurship in Kosovo*. Retrieved from https://helvetas-ks.org/eye/file/repository/The_Rise_of_Future_Leaders_SE_in_Kosovo_Final.pdf.

[18] Khan, I., Jia, M., Lei, X., Niu, R., Khan, J., & Tong, Z. (2022). Corporate social responsibility and firm performance. *Total Quality Management & Business Excellence*, 34(5-6), 672-691. doi: 10.1080/14783363.2022.2092467.

[19] Kosovo – project "Green Country for the Future". (2020). Retrieved from https://kk.rks-gov.net/fushekosove/sr/kosovo-projekat-zelenje-zemlje-za-buducnost-grenland/.
[20] Kosovo Energy Corporation. (2024). Retrieved from http://kek-energy.com/kek/en/profile-of-kek/.
[21] Kryukova, I., Zamlynskyi, V., & Vlasenko, T. (2023). Architecture of corporate reporting on the sustainable development of business entities in the agrarian sector as a tool of sustainable agri-management. *Ekonomika APK*, 30(2), 38-48. doi: 10.32317/2221-1055.202302038.
[22] Ktit, M., & Khalaf, B.A. (2024). Corporate governance, corporate social responsibility, and dividends in Europe. *Corporate Ownership & Control*, 21(1), 39-46. doi: 10.22495/cocv21i1art4.
[23] Kyfyak, V., Kindzerskyi, V., Todoriuk, S., Klevchik, L., & Luste, O. (2024). The role of economics and management in the development of sustainable business models of agricultural enterprises. *Scientific Horizons*, 27(6), 152-162. doi: 10.48077/scihor6.2024.152.
[24] Lagotyuk, V. (2023). Personnel development strategy as a way to ensure enterprise competitiveness. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 10(3), 41-48. doi: 10.52566/msu-econ3.2023.41.
[25] Lazaj, A., Teta, J., & Xhafka, E. (2024). Economic growth and foreign direct investment in Balkans. *Economics of Development*, 23(3), 8-17. doi: 10.57111/econ/3.2024.08.
[26] Levkov, N., & Palamidovska-Sterjadovska, N. (2019). Corporate social responsibility communication in Western Balkans banking industry: A comparative study. *Management Research and Practice*, 11(3), 17-30.
[27] Michelon, G., Rodrigue, M., & Trevisan, E. (2019). The marketization of a social movement: Activists, shareholders and CSR disclosure. *Accounting Organizations and Society*, 80, article number 101074. doi: 10.1016/j.aos.2019.101074.
[28] Murtezaj, I.M., Rexhepi, B.R., Dauti, B., & Xhafa, H. (2024). Mitigating economic losses and prospects for the development of the energy sector in the Republic of Kosovo. *Economics of Development*, 23(3), 82-92. doi: 10.57111/econ/3.2024.82.
[29] Nawaz, T. (2017). Exploring the nexus between human capital, corporate governance and performance: Evidence from Islamic banks. *Journal of Business Ethics*, 157(2), 567-587. doi: 10.1007/s10551-017-3694-0.
[30] Nicolás-Salas, A.B., & Lorente, Á.R.M. (2024). The influence of quality management standards on customer satisfaction in hotels: An exploratory study. *Journal of Tourism Analysis*, 31(1), 34-68. doi: 10.53596/bz36g655.
[31] Ntim, C.G., & Soobaroyen, T. (2013). Corporate governance and performance in socially responsible corporations: New empirical insights from a neo-institutional framework. *Corporate Governance an International Review*, 21(5), 468-494. doi: 10.1111/corg.12026.
[32] Ponomarenko, V., & Pysarchuk, O. (2024). Peculiarities of the impact of learning losses on the formation of human capital in Ukraine under martial law. *Economics of Development*, 23(1), 38-52. doi: 10.57111/econ/1.2024.38.
[33] Ponomarenko, V., Gontareva, I., & Dorokhov, O. (2014). Statistical testing of key effectiveness indicators of the companies (Case for Ukraine in 2012). *Ikonomicheski Izsledvania*, 23(4), 108-124.
[34] Post and Telecom of Kosovo (PTK). (2024). Retrieved from https://balkaninsight.com/tag/post-and-telecoms-of-kosovo-ptk/.
[35] ProCredit Bank. (2024). Retrieved from https://procreditbank.com.ua/en/sp-opening-of-accounts.
[36] Pucheta-Martínez, M.C., & Gallego-Álvarez, I. (2018). An international approach of the relationship between board attributes and the disclosure of corporate social responsibility issues. *Corporate Social Responsibility and Environmental Management*, 26(3), 612-627. doi: 10.1002/csr.1707.
[37] Raiffeisen Bank Kosovo. (2024). Retrieved from https://www.raiffeisen-kosovo.com/en/about-us.html.
[38] Rao, K.K., & Tilt, C. (2020). Gender and CSR decisions: Perspectives from Australian boards. *Meditari Accountancy Research*, 29(1), 60-85. doi: 10.1108/medar-11-2019-0609.
[39] Rappai, S.A. (2024). *Manufacturing new opportunities in the Western Balkans*. Retrieved from https://www.ifc.org/en/stories/2024/manufacturing-new-opportunities-western-balkans.
[40] Setyaningsih, S., Widjojo, R., & Kelle, P. (2024). Challenges and opportunities in sustainability reporting: A focus on small and medium enterprises (SMEs). *Cogent Business & Management*, 11(1), article number 2298215. doi: 10.1080/23311975.2023.2298215.
[41] Shahrour, M.H. (2024). Editorial: Emerging trends and global practices – charting the future of corporate governance. *Journal of Governance & Regulation*, 13(3), 4-5. doi: 10.22495/jgrv13i3editorial.
[42] Shaukat, A., Qiu, Y., & Trojanowski, G. (2015). Board attributes, corporate social responsibility strategy, and corporate environmental and social performance. *Journal of Business Ethics*, 135(3), 569-585. doi: 10.1007/s10551-014-2460-9.
[43] Tafolli, F., & Grabner-Kräuter, S. (2020). Employee perceptions of corporate social responsibility and organizational corruption: Empirical evidence from Kosovo. *Corporate Governance*, 20(7), 1349-1370. doi: 10.1108/cg-07-2020-0274.
[44] Telekom Srbija. (2024). Retrieved from https://telekomsrbija.com/about-us/.
[45] United Nations Development Programme. (2023). *The status of the implementation of the UNGPs on business and human rights in Europe and Central Asia*. Retrieved from http://surl.li/wbriri.

[46] Velte, P. (2019). Does board composition influence CSR reporting? A meta-analysis. *Corporate Ownership and Control*, 16(2), 48-59. doi: 10.22495/cocv16i2art5.
[47] World Bank. (2022). *Republic of Kosovo: Systematic country diagnostic update*. Retrieved from http://surl.li/vpvatn.
[48] Yatsiv, I., Pavlenchyk, N., Pavlenchyk, A., Krupa, V., & Yatsiv, S. (2024). Basic principles of corporate social responsibility management under martial law. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(1), 103-113. doi: 10.52566/msu-econ1.2024.103.
[49] Zahid, R.A., Taran, A., Khan, M.K., & Simga-Mugan, C. (2023). The effect of ownership composition on corporate financial performance in the European frontier markets. *Baltic Journal of Management*, 18(2), 242-261. doi: 10.1108/bjm-12-2021-0457.

Вплив корпоративного управління та структури акціонерного капіталу на корпоративну соціальну відповідальність

Арта Хоті Аріфадж
Доктор економічних наук, доцент
AAB College
10000, вул. Елез Беріша, 56, м. Приштина, Республіка Косово
https://orcid.org/0000-0001-7076-8072
Ілір Рекшепі
Доктор економічних наук, доцент
AAB College
10000, вул. Елез Беріша, 56, м. Приштина, Республіка Косово
https://orcid.org/0000-0003-0339-3180
Блерта Халіті Баруті
Доктор економічних наук, доцент
AAB College
10000, вул. Елез Беріша, 56, м. Приштина, Республіка Косово
https://orcid.org/0000-0002-3977-7947

Анотація. Актуальність дослідження зумовлена важливістю ефективного корпоративного управління для реалізації корпоративної соціальної відповідальності, яка є критично важливою для забезпечення стійкості бізнесу в умовах глобалізації та адаптації до європейських стандартів. Від того, наскільки ефективно компанії впроваджують управлінські практики, залежить їхня здатність реагувати на соціальні виклики та підтримувати довіру інвесторів. Метою дослідження було вивчення ключових аспектів впливу корпоративного управління та структури акціонерного капіталу на корпоративну соціальну відповідальність у країнах Західних Балкан, включаючи Косово, з огляду на особливі виклики перехідних економік та міжнародну підтримку. Методологія дослідження включала кількісний емпіричний аналіз на основі структурованого опитування компаній у різних секторах економіки Косова, що дозволило оцінити практики управління та корпоративної соціальної відповідальності. Крім того, були використані економетричні методи для визначення впливу незалежності ради директорів та концентрації капіталу на корпоративну соціальну відповідальність. Основні результати дослідження свідчать про значний позитивний вплив незалежності рад директорів на соціальні інвестиції компаній, зокрема, через підвищення прозорості управління та зниження ризиків корупції. Було виявлено, що компанії з розподіленою структурою акціонерного капіталу схильні до участі в довгострокових соціальних проектах, тоді як компанії з високою концентрацією власності частіше зосереджуються на короткострокових ініціативах. Міжнародні партнери, включаючи Європейський банк реконструкції та розвитку і Міжнародну фінансову корпорацію, відіграють ключову роль у забезпеченні прозорих стандартів управління, підтримуючи інтеграцію Косова у світову економічну систему. Дослідження також показало, що банки та енергетичні компанії в Косові активно впроваджують екологічні стандарти як невід'ємну частину своїх стратегій корпоративної соціальної відповідальності. Отримані результати підтверджують важливість збалансованого корпоративного управління та міжнародної підтримки для довгострокової стійкості компаній у регіоні

Ключові слова: соціальні інвестиції; сталий розвиток; довгострокові проекти; незалежні директори; інвестори; бізнес-стратегії

Scientific Bulletin
of Mukachevo State University
Series
Economics

Volume 11, No. 4, 81-92
Journal homepage: https://economics-msu.com.ua/en

UDC 658.155.2:336.1
DOI: 10.52566/msu-econ4.2024.81

Analysis of the financial derivatives for risk management in the context of financial market instability

Hanna Tkachuk*
PhD in Economics
Zhytomyr Polytechnic State University
10005, 103 Chudnivska Str., Zhytomyr, Ukraine
https://orcid.org/0000-0001-6188-3028

Igor Burachek
PhD in Economics
Zhytomyr Polytechnic State University
10005, 103 Chudnivska Str., Zhytomyr, Ukraine
https://orcid.org/0000-0003-0549-6917

Volodymyr Vyhovskyi
PhD in Economics
Zhytomyr Polytechnic State University
10005, 103 Chudnivska Str., Zhytomyr, Ukraine
https://orcid.org/0000-0001-5642-0774

Anhelina Sotnyk
PhD in Economics
Zhytomyr Polytechnic State University
10005, 103 Chudnivska Str., Zhytomyr, Ukraine
https://orcid.org/0000-0002-0217-988X

Iryna Tsaruk
PhD in Economics
Zhytomyr Polytechnic State University
10005, 103 Chudnivska Str., Zhytomyr, Ukraine
https://orcid.org/0000-0002-9628-3257

Received: 10.09.2024, Revised: 06.12.2024, Accepted: 27.12.2024

Suggested Citation: Tkachuk, H., Burachek, I., Vyhovskyi, V., Sotnyk, A., & Tsaruk, I. (2024). Analysis of the financial derivatives for risk management in the context of financial market instability. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 81-92. doi: 10.52566/msu-econ4.2024.81.

*Corresponding author

Abstract. The study aimed to analyse the possibilities and efficiency of financial derivatives as instruments for hedging and minimizing risks in financial markets. The research methodology included the classification of financial derivatives according to various criteria, including their structure and underlying assets. The main types of derivatives were identified: futures, forwards, options and swaps used to hedge risks in the commodity and financial instruments markets. The results of the study indicate that financial derivatives are substantial in reducing the impact of negative changes in the market, opening new opportunities for investors and companies in the context of hedging, speculation and arbitrage. The study determined that the evolution of financial derivatives was driven by the need to adapt to constantly changing market conditions, especially during crises and periods of volatility. The study also addressed the impact of financial technologies (fintech) and blockchain technologies on the derivatives market, emphasising the importance of automation and increased transparency of transactions. As noted, the derivatives market had undergone significant changes due to the introduction of new technologies that had improved the availability and speed of trading. Particular attention was devoted to the analysis of the Ukrainian derivatives market, where economic and political instability creates a need for effective risk management. A separate element of the study was the development of a model for the effective use of financial derivatives for risk management based on the example of Kernel. The model included the stages of risk assessment, selection of appropriate financial instruments, as well as monitoring and adjustment of strategies. The findings of the study emphasize that the derivatives market in Ukraine is still in the development stage, which is due to the limited understanding of these instruments among market participants

Keywords: hedging; currency fluctuations; blockchain; economic stability; interest rates

Introduction

Financial markets are inherently characterised by constant change and volatility, which can pose significant risks to investors, corporations and government institutions. In times of economic crises or heightened volatility, these risks become particularly pronounced, requiring the introduction of effective tools to manage them. One of the most popular and effective mechanisms for reducing risks in financial markets is the use of financial derivatives.

Financial derivatives, such as options, futures, swaps and forwards, allow investors and companies to hedge their exposure to fluctuations in asset prices, change their capital management strategies and generate additional income through speculation. These instruments are especially important in volatile markets when traditional risk management methods do not always provide adequate protection. The use of derivatives allows for fixing the value of assets or liabilities, preventing their further negative impact on the financial results of market participants.

The research relevance is determined by global financial markets becoming increasingly exposed to various risks due to factors such as political instability, changes in central bank monetary policy, currency fluctuations, as well as the effects of pandemics and military conflicts. In such circumstances, risk management is of particular importance to all market participants. The ability to effectively use financial derivatives allows not only to minimise losses but also to gain competitive advantages. However, despite the widespread use of derivatives, there are also several problems associated with their complexity and risks. For instance, the improper use of derivatives can lead to an increase in risks rather than a decrease in them. In addition, due to their complex structure, these instruments may not be accessible to small investors or companies with limited resources.

The use of financial derivatives for risk management has become one of the key topics in financial science, as market volatility requires new approaches to risk management. For instance, M. Balcilar *et al.* (2021) investigated how futures contracts help reduce risks in commodity markets, especially in conditions of increased volatility. Their conclusions confirm that hedging with futures is an effective tool for price stabilisation, although an incorrect risk assessment can result in additional losses for companies. A.N. Slobodianyk *et al.* (2021) analysed the use of options to hedge currency risks, drawing attention to the flexibility of these instruments, which allow for adjusting strategies depending on the market situation.

Similarly, G. Vuillemey (2019) investigated how interest rate swaps are used to manage interest rate risks in the banking sector. The author shows that these instruments become especially useful in times of fluctuating central bank rates when banks are forced to look for ways to minimise losses. Meanwhile, S. Kolbari (2019) highlighted the challenges faced by small and medium-sized enterprises in using derivatives. The author argued that the complexity of these instruments and lack of awareness often become obstacles to their successful implementation. S. Fu *et al.* (2021) analysed the role of forward contracts in the agricultural sector, emphasising their effectiveness in fixing commodity prices, which can reduce the risks associated with market fluctuations. D.H. Vo *et al.* (2019), studying the impact of financial derivatives during the global financial crises, emphasised that although these instruments partially contributed to the development of the crisis, their proper use allowed many companies to stabilise their positions after the crisis.

D.K. Tarullo (2019) addressed the regulatory changes in the use of derivatives that occurred after the financial crises. The author notes that increased regulation has reduced risks to the financial system, but at the same time has limited access to derivatives for some market players. At the same time, V.M. Oliinyk *et al.* (2019) studied the role

of derivatives in the economy and concluded that futures and swaps are key instruments for stabilising market prices in times of instability. S.B. Seo & J.A. Wachter (2019) added that corporations often use options as an additional layer of insurance against market fluctuations, which allows them to reduce risks in the face of unpredictable changes in the markets. Z. He & A. Krishnamurthy (2019) highlighted the systemic risks associated with the use of derivatives. They warned that the uncontrolled use of complex derivatives can lead to chain reactions in the markets, increasing risks for the entire financial system.

An analysis of the studies of various authors demonstrates that financial derivatives are effective risk management tools, but their use requires a high level of competence, strategic planning and compliance with regulatory requirements. Despite numerous studies, several aspects remain unexplored. Insufficient attention was devoted to the analysis of the effectiveness of derivatives for small and medium-sized enterprises, which often face barriers to their use due to limited resources and knowledge. In addition, the study of the impact of new technologies, such as financial technologies and blockchain, on the derivatives market is at an early stage, which creates a need to investigate their role in changing approaches to risk management. The study aimed to analyse the use of financial derivatives for risk management in crises in financial markets. The objectives of the study were to analyse the peculiarities of the use of financial derivatives by small and medium-sized enterprises in conditions of instability, as well as to investigate the impact of new technologies on the financial derivatives market and their role in changing risk management strategies.

Materials and Methods

The research methodology included the following stages: systematic literature review, analysis of market data, selection and study of Ukrainian exchange platforms, and development of a specialised risk management model for a Ukrainian company. Each of these stages used different methods of scientific knowledge, including analysis, synthesis, generalisation and induction. The first stage involved a systematic review of the literature on financial derivatives. Academic articles, reports, analytical reviews and other sources covering the classification, features and functions of derivatives in financial markets were analysed. The focus was on the types of derivatives, such as futures, forwards, options and swaps. The method of analysis and comparison, highlighted the specific characteristics of each type of instrument, enabling management of different types of risks. This review also identified the key issues and challenges associated with the use of financial instruments, as well as how these instruments can contribute to risk mitigation.

The next step was to quantitatively analyse market data to identify global trends in the use of derivatives. Using data from the Statista platform (Largest derivatives exchanges worldwide..., 2024), the Group analysed statistics on the world's largest derivatives exchanges by number of trading contracts in the period from 2020 to 2023. The method of quantitative analysis made it possible to identify the peculiarities of derivatives trading at the global level and compare this data with the situation in the Ukrainian market. The analysis also considered the impact of new technologies, such as fintech and blockchain, on the functioning of the derivatives market. This step determined how digital innovations are changing trading and risk management processes, which was made possible by applying induction to generalise the impact of technology.

A separate stage of the study was devoted to the analysis of Ukrainian exchange (2008), First Stock Trade System (PFTS) (2024) and the Perspectiva Stock Exchange. The comparative analysis method was used to collect and evaluate data on the volume of trading in financial instruments on these exchanges, taken from the National Securities and Stock Market Commission (Analytical data on…, 2024), for the period from 2019 to 2023. The information obtained revealed trends in the development of the derivatives market in Ukraine, as well as the impact of internal and external economic factors on trading volumes. The market's reaction to political instability and macroeconomic changes was also investigated, using a generalisation method to identify key patterns.

The final stage was the creation of a model for the effective use of derivatives for risk management. For this purpose, analysis and modelling methods were used to structure the process of selecting derivatives depending on the specifics of the company's risks. In particular, the model included the stages of selecting the type of derivative, assessing the capabilities of specific exchanges for concluding transactions and developing risk management strategies. The main goal of this model is to optimise risk management processes for more efficient use of financial instruments, which was made possible by combining quantitative and qualitative approaches.

Results

Financial derivatives are an integral part of modern financial markets and are substantial in managing risk and providing stability for market participants. They are contracts that are based on the price or value of another asset, called an underlying asset. This can be stocks, currencies, bonds, indices, commodities or other financial instruments. Thus, derivatives allow investors and companies to hedge against unpredictable changes in the markets, while providing opportunities for speculation and risk diversification. One of the key concepts related to financial derivatives is hedging. This process involves the use of derivatives to protect against losses due to changes in the value of the underlying assets. Another important function of derivatives is speculation, where investors buy or sell derivatives in the hope that the value of the underlying asset will change to make a profit. The third function, arbitrage, is to profit from differences in the prices of identical or related assets in different markets without risk (Carbonneau & Godin, 2021).

Financial derivatives are classified according to various criteria. First, there are several main types of derivatives

depending on their structure and underlying assets. The most common of these are futures, forwards, options and swaps. Futures are standardised contracts to buy or sell an asset in the future at a predetermined price. Futures are widely used to hedge risks in commodity markets, such as oil, gold, and grain, and financial instruments, such as foreign exchange rates or interest rates (Sosoo *et al.*, 2021). Forwards are contracts to buy or sell an asset at a predetermined price in the future, but unlike futures, forwards are not standardised and are usually concluded between two parties on the over-the-counter market. They provide more flexibility but carry higher risks due to the lack of regulation and standardisation (Balakrishnan, 2020). Options are financial contracts that give the right, but not the obligation, to buy or sell an asset at a fixed price in the future. Options are divided into call options (the right to buy) and put options (the right to sell). This is one of the most flexible instruments, as investors can exercise the right only if it is profitable, which allows for more efficient risk management (Schwarcz, 2020). Swaps are contracts under which two parties agree to exchange cash flows or liabilities. The most common are interest rate swaps, where companies or financial institutions exchange fixed and floating interest rates to reduce the risks associated with rate fluctuations. Another common type is currency swaps, which allow market participants to reduce currency risks (Yu *et al.*, 2022).

In addition to the main types, financial derivatives can also be classified according to their market environment. Exchange-traded derivatives are traded on regulated exchanges, which provides a high level of transparency and security for participants. They are standardised in terms of contract size, terms and conditions, and maturity. Over-the-counter (OTC) derivatives are less regulated and have greater flexibility as contract terms can be tailored to the needs of the parties, but they carry greater credit risk as the participants are responsible for fulfilling their obligations to each other. Given the wide range of instruments and opportunities, financial derivatives play an important role in risk management in modern markets. They not only help to reduce the impact of negative market changes but also open new opportunities for investors and companies in the context of hedging, speculation and arbitrage. However, their complexity, as well as the possible risks associated with their misuse, require a high level of financial literacy and regulatory control. The evolution of financial derivatives was driven by the need to adapt to constantly changing market conditions, especially in times of instability. Since their inception, derivatives developed from simple commodity futures transactions to complex financial instruments used to manage a wide range of risks. In times of crisis and high volatility, derivatives have become particularly important as they have become important instruments to protect against unpredictable market fluctuations and losses. Their evolution has always been influenced by market conditions, technological progress and regulatory changes.

The formal development of derivatives markets began in the 19th century when standardised futures contracts for agricultural commodities appeared on the Chicago and London stock exchanges. These early derivatives were simple in nature and were used primarily to hedge risks in commodity markets. Over time, financial markets became increasingly complex, leading to the need to create new types of derivatives to manage risks in a more volatile environment. In the mid-twentieth century, financial futures and options, on indices and currencies, began to develop rapidly, reflecting the growing globalisation and integration of global financial markets. In the 1970s, when global markets began to move to floating exchange rates after the collapse of the Bretton Woods system, currency derivatives gained particular importance (Pauletto, 2012). Their emergence protected companies and investors from currency fluctuations that became a regular feature of global markets.

The financial crisis of 2008 marked a turning point in the history of derivatives (Babayev & Sabzaliyev, 2024). Until then, derivatives had been actively used not only for hedging but also for speculative purposes, leading to a significant increase in their volumes on the market. One of the factors that led to the crisis was the excessive use of complex derivatives, such as credit default swaps (CDS) and securitised assets, which were poorly understood by many market participants. After the crisis, derivatives became associated with increased risks, which triggered a wave of regulatory changes. Authorities in many countries introduced stricter requirements for transparency, settlement and risk management in the derivatives market (Bryan & Rafferty, 2014). In response to these developments, significant changes in the structure and use of derivatives have occurred since the 2008 financial crisis. Regulators introduced new requirements for centralised clearing and reporting of OTC derivatives, which reduced risks to financial systems and increased market transparency. This improved market risk assessment and determination of the value of derivatives, reducing the likelihood of a recurrence of systemic crises.

However, the evolution of derivatives did not stop. The derivatives markets have been actively influenced by the latest technologies, such as fintech and blockchain. The introduction of digital platforms for derivatives trading, as well as the development of algorithmic trading, have changed the speed and accessibility of derivatives transactions (Makedon *et al.*, 2022). Today, blockchain technologies and smart contracts are opening new opportunities for the development of derivatives markets, offering greater automation and security, which is especially important in the context of growing market volatility. Table 1 shows the world's largest derivatives exchanges by number of trading contracts.

The National Stock Exchange of India (NSE) showed the largest increase, indicating the rapid growth of the Indian derivatives market, which can be explained by the growing demand for financial instruments in the rapidly developing country. The B3 exchange (Brazil) also showed stable trading volumes. This indicates a certain stabilisation of the market after significant growth. CME Group, one of the world's largest exchanges, showed moderate but steady growth. This confirms its role as a key player in the

global derivatives market. Other exchanges, such as the Bombay Stock Exchange, showed significant growth, indicating that the Indian stock market is picking up. The CBOE Holding exchange has also shown steady growth, reflecting the high demand for risk-hedging instruments. Among the Chinese exchanges, the Zhengzhou Commodity Exchange has shown a noticeable increase in the number of contracts. This may indicate increased activity in commodity derivatives. The Nasdaq, Intercontinental Exchange, Dalian Commodity Exchange, Shanghai Futures Exchange and Korea Exchange have shown stable results over the past four years, with only minor fluctuations. Eurex and Miami International Holdings showed modest growth or a slight decline in trading volumes, which may reflect lower demand for derivatives in these regions or market consolidation.

Table 1. Largest derivatives exchanges in the world in 2020-2023 by number of trading contracts, million

	2020	2021	2022	2023
National Stock Exchange of India	8850	17255	38114	84807
B3	6343	8756	8314	8315
CME Group	4821	4943	5846	6099
Bombay Stock Exchange	848	1435	1417	5827
CBOE Holding	2614	3096	3476	3708
Zhengzhou Commodity Exchange	1702	2582	2398	3533
Nasdaq	2661	3293	3148	3204
Intercontinental Exchange	2789	3318	3435	2910
Dalian Commodity Exchange	2207	2364	2275	2508
Borsa Istanbul	1517	2018	2727	2086
Shanghai Futures Exchange	2129	2446	1843	2061
Korean stock exchange	2185	2282	2058	2038
Eurex	1861	1703	1956	1915
Miami International Holdings	827	1338	1299	1587

Source: compiled by the authors based on Largest derivatives exchanges worldwide from 2020 to September 2024, by number of contracts traded (2024)

Financial technology has made derivative transactions more accessible and faster. Fintech companies offer platforms for electronic trading in derivatives, automate contract execution processes and reduce costs associated with intermediaries. These technologies help to optimise derivatives operations, which is especially important for real-time risk hedging (Alsahlawi, 2021). One example of how fintech is being used is through automated trading platforms such as Tradeweb or MarketAxess. They allow market participants to execute derivatives transactions on electronic platforms, which significantly reduces transaction times and makes the market more liquid. Before the introduction of such platforms, participants had to rely on manual trading or complex transactions through brokers, which was slower and more expensive. Automation also reduces the risk of errors that can occur during the execution of transactions. Fintech helps to solve the problem of the complexity of settling derivative contracts. Previously, this process was very labour-intensive and risky due to numerous transactions and intermediaries. The introduction of clearing platforms that use automated data processing systems helps speed up settlements and reduce credit risks. LCH Clearnet platform for derivatives is a notable example of how automation reduces complexity and improves settlement efficiency.

Blockchain is opening new horizons for financial markets, especially in the derivatives sector (Spytska, 2023). This technology creates decentralised, tamper-proof ledgers that can significantly improve transparency and reduce fraud risks. Derivatives that are recorded on the blockchain become fully traceable as all transactions are recorded in a distributed database. This allows both market participants and regulators to track who concluded a transaction, when and under what conditions (Zhang *et al.*, 2020). One example of the use of blockchain for derivatives is the Axoni platform, which works on projects in the field of credit derivatives. By using blockchain, Axoni enables automatic contract execution through smart contracts and improves tracking of ownership and settlement. Smart contracts allow derivatives to be automatically executed when certain conditions are met, eliminating the need for intermediaries and reducing the risk of default. It also reduces the time to execute transactions, increasing the speed and reliability of operations. Another significant contribution of blockchain to the derivatives industry is the reduction of transaction costs. OTC derivatives are typically complex and require a significant amount of paperwork and manual coordination between the parties. Blockchain automates this process, reducing the amount of administrative work and ensuring that all contract pages are synchronised in real-time.

Despite the significant advantages of fintech and blockchain, their implementation is also accompanied by challenges. One of the main challenges is the scalability of the technologies, especially blockchain. Traditional exchanges and platforms can process millions of transactions per day, while blockchains face limitations in terms of transaction processing speed. While technologies such as Ethereum

2.0 are attempting to address this problem by updating the consensus mechanism, the issue of scalability remains open (Mosteanu & Faccia, 2020). Another challenge is the regulatory uncertainty surrounding blockchain derivatives. While technology creates opportunities to increase transparency and reduce risk, regulators are still trying to find the right balance between protecting market participants and supporting innovation. This is particularly important for OTC derivatives, where transactions are often complex and unpredictable. In practice, however, the introduction of these technologies is already yielding significant results. For example, ISDA's Common Domain Model (CDM) platform, which uses blockchain to standardise and automate derivatives contracts, has enabled banks to significantly reduce the time and cost of processing complex financial transactions. Market participants can see a reduction in errors and faster settlement through the integration of smart contracts and distributed ledger technology.

Financial derivatives are playing an increasingly important role in risk management in the Ukrainian market, where economic and political instability often affects businesses and financial institutions. In the face of constant fluctuations in the hryvnia exchange rate, changes in energy prices, and other macroeconomic factors, derivatives are becoming a tool that allows companies and investors to protect themselves from market risks (Kyfyak *et al*., 2024). However, the use of these instruments in Ukraine is still at a developing stage, with many challenges and prospects related to the regulatory framework, limited market knowledge and product availability.

The derivatives market in Ukraine has not yet reached the level of development seen in Western countries. The main issue is the limited awareness of the instruments and their use among many market participants. Many companies and investors do not yet have sufficient experience to use derivatives effectively (Shuplat *et al*., 2022). This results in insufficient demand for such products. It is also worth noting that Ukraine's regulatory framework, while constantly improving, does not yet fully meet the needs of the derivatives market. The absence of a clear and transparent infrastructure for derivatives trading and clearing may cause problems with market confidence, especially among foreign investors. Although the National Securities and Stock Market Commission (NSSMC) is working to create an effective regulatory platform for derivatives, this process will take time and require significant investment.

The derivatives market in Ukraine, although recently introduced, has significant potential for development. The main exchanges involved in derivatives trading in Ukraine include the Ukrainian Exchange (UX), PFTS and Perspektyva Stock Exchange. The Ukrainian Exchange (UX), founded in 2008, is one of the key trading platforms on the Ukrainian stock market. It has quickly gained a reputation as an innovative and modern exchange, thanks to the introduction of an electronic trading system and the development of the derivatives market. The futures and options contracts offered on the exchange are the main instruments for managing financial risks, including currency, interest rate and commodity risks. The Ukrainian Exchange plays an important role in the formation and development of the derivatives market in Ukraine. One of the main advantages of UX is its high liquidity, which makes it attractive to both domestic and international investors. The exchange operates on a central counterparty (CCP) technology, which increases the reliability and security of derivatives trading.

PFTS is one of the oldest stock exchanges in Ukraine, founded in 1996. The exchange was initially a key player in the equity market but later expanded its capabilities to include derivatives in the list of financial instruments. The PFTS is known for its many years of experience and reliability, making it an important element of the country's financial infrastructure. Although the PFTS has experienced periods of reduced activity, the exchange continues to develop instruments for risk hedging and portfolio investment. The PFTS offers traders and investors access to futures contracts on currencies, indices and bonds, which allows them to effectively manage market risks. The exchange maintains high standards of reporting and transparency, which fosters trust among market participants.

Perspektyva Stock Exchange is one of the leading derivatives trading platforms in Ukraine. It has been actively developing since its foundation and is focused on innovative technologies and international standards in the field of financial instruments trading. The exchange pays particular attention to investors interested in hedging financial risks through futures and options contracts on commodities, shares and other assets. "Perspektya" provides a wide range of products for risk management, especially in times of volatile financial markets. Its trading platforms are user-friendly and highly automated, making the trading process fast and efficient. The exchange also actively supports market transparency by cooperating with government regulators to improve the legal environment and develop the Ukrainian derivatives market. Table 2 shows the volume of financial instruments traded on organised capital market operators.

Table 2. The trading volume of financial instruments on organised capital market operators in 2019-2023, UAH billion

	2019	2020	2021	2022	2023
PFTS	114.8	131.5	221.5	84	274.7
Perspektyva	186.4	201.5	217.1	61.2	147
Ukrainian Exchange	3.8	2.4	13.3	15.4	14.8
Total	305	334.4	452	160.6	436.4

Source: compiled by the authors based on Analytical data on stock market development (2024)

Trading volumes on exchanges underline the important role of financial instruments, including derivatives, in managing risk in volatile environments. The marked decline in trading volume in 2022 across all exchanges reflects the significant challenges faced by market participants due to the war. However, the growth in 2023 shows that financial market participants are adapting and trying to find tools to minimise risks. Derivatives, as hedging instruments, could become an important part of this strategy, allowing businesses and investors to reduce market uncertainty in the face of sharp fluctuations.

Effective risk management with the help of financial derivatives is extremely important for Ukrainian companies, especially in the context of instability caused by both internal and external factors. A model for the effective use of financial derivatives for risk management was developed, which consists of several steps. The first step is to identify the main risks that may affect the financial stability of the enterprise. These risks include currency risk associated with fluctuations in exchange rates, price risk arising from changes in global commodity prices, and interest rate risk arising from changes in market interest rates. The next step is to choose the best financial instruments to hedge the risks. For example, for currency risk, it is advisable to use futures and forward currency contracts. To hedge price risk, an effective solution is to enter futures contracts. To manage interest rate risk, it is useful to enter interest rate swaps. Here, it is essential to determine the choice of the exchange on which the transactions will be concluded. For example, a company can choose one of the major exchanges, depending on the specifics of its needs.

The model also provides for the development of a hedging strategy that integrates the selected financial instruments into the company's overall financial policy. This strategy includes regular monitoring of market conditions, exchange rates, agricultural commodity prices and interest rates. It is also necessary to use combinations of derivatives to cover different risks simultaneously, ensuring reliable protection of assets. Assessing the effectiveness of derivatives is another important step. To do this, financial resources saved can be analysed by comparing potential losses without hedging with actual losses after entering contracts. The volatility of the financial indicators of the company and their stability in the face of market fluctuations should also be assessed. The model should be flexible and include mechanisms for adjusting the strategy based on changes in market conditions. If new risks emerge or market conditions change, the company can adapt its strategy by changing the choice of financial instruments or the amount of hedging. The example of one of the leading agricultural companies in Ukraine, Kernel (2023), which exports agricultural products, provides a detailed look at the model of using derivatives to hedge currency, price and interest rate risks.

First, the company faces currency risks, as most of its export contracts are in foreign currencies, and business expenses are incurred in hryvnia (Zelisko *et al*., 2024). In times of war, when the hryvnia exchange rate against foreign currencies can fluctuate sharply due to economic instability, this risk is particularly acute. For instance, if Kernel plans to enter a USD 50 million export contract with payment due in six months, the company may suffer significant losses due to a devaluation of the hryvnia or, conversely, its unexpected appreciation. To hedge such risks, it is advisable to use currency futures contracts. If the exchange rate is UAH/USD 42 at the time of the contract conclusion, Kernel can fix this rate through futures agreements. This helps to avoid unfavourable changes in the exchange rate and stabilise the company's revenue planning. If in 6 months the hryvnia/dollar exchange rate changes to UAH/USD 45, the company will lose on the contract price but will compensate for it by gaining on the futures contract. If, on the contrary, the exchange rate drops to UAH/USD 35, the additional market gains will be balanced by losses on derivative transactions, allowing the company to maintain its projected level of income.

Price risk associated with changes in global agricultural commodity prices is another significant challenge for Kernel. Global prices for commodities such as sunflower oil and grain can fluctuate significantly depending on supply, demand and geopolitical factors (Manachynska *et al*., 2024). In the event of a price decline, the company may suffer significant financial losses, which is why hedging with agricultural futures contracts is an optimal solution. For instance, if the price of sunflower oil is USD 900 per tonne at the time of contracting, the company can enter futures contracts to sell the future harvest at this price. If the world price falls to USD 800 per tonne in a few months, the company will retain its benefit through futures, which helps to avoid losses and stabilise its financial results. On the other hand, if the price rises to USD 950 per tonne, the company may lose potential profits from the price increase, but it receives predictable and stable income using derivatives. Such a strategy is extremely important in the face of unpredictable changes in global markets, which is further exacerbated by the military action in Ukraine, which affects international supply chains and demand.

Another important factor is interest rate risk, which arises from changes in the cost of credit. Companies like Kernel often take out loans to finance their operations, and if the interest rate on these loans changes, it can have a significant impact on the company's financial performance. For instance, if the company has floating-rate loans and interest rates in the market start to rise, this could lead to higher debt service costs. To avoid this risk, the company can enter interest rate swaps that allow it to fix interest rates at a certain level. For instance, Kernel can fix the interest rate on its loans at 5%, even if the market rate rises to 7%. This will help the company avoid an increase in its financial burden due to the rising cost of borrowed funds.

The effectiveness of derivatives in managing risk can be assessed using quantitative measures. For example, the cost of hedging can be compared to the actual losses that the company avoided by using futures, options or swaps. In the case of currency risk hedging, for example, it is

possible to calculate how much exchange rate changes could have affected the company's profitability without the use of derivatives and how much resources were saved due to the contracts. It is also essential to assess the extent to which the use of derivatives reduces the volatility of the company's financial performance and stabilises its profitability in difficult periods. Assessment of the profitability of derivatives helps to determine whether the costs of their use are justified and whether they lead to cost savings compared to potential losses. Thus, the developed model shows that companies that use derivatives to hedge currency, price and interest rate risks can significantly reduce the negative impact of market fluctuations, especially in times of crisis or war. The example of Kernel shows how a well-chosen strategy of using futures, options and swaps allows the company to remain competitive and protected from unpredictable changes in the market. This is an important step for business stability in the face of an unstable financial environment and global market challenges faced by Ukrainian companies due to the war and economic turmoil.

Discussion

The results of the study demonstrate the importance of financial derivatives as instruments for risk management in times of economic instability in the example of the Ukrainian market. They emphasise that understanding the types of derivatives and their functions is critical for the effective use of these instruments. The classification of derivatives into futures, forwards, options, and swaps can be used to highlight the specifics of their use depending on market needs and individual company strategies. S.M. Bartram (2019) investigated the impact of derivatives on the stability of financial markets. The author found that the use of derivatives helps to reduce market volatility, as they allow participants to hedge risks. C. González Pedraz & A.V. Rixtel (2021), in turn, emphasise the importance of regulating and standardising derivatives to increase their efficiency. This correlates with the results of the current study, which also emphasises the importance of the regulatory environment for the development of the derivatives market. However, the authors put more emphasis on market stability, while the current study focuses on the specific risks faced by companies.

It is particularly important to analyse the difference between exchange-traded and OTC derivatives. Exchange-traded derivatives, which are highly standardised and regulated, provide greater security for market participants (Nogoibaeva *et al*., 2024). At the same time, OTC derivatives offer more flexibility, although they are associated with increased risks due to the lack of centralised control. This feature may be important for Ukrainian companies seeking to adapt to rapidly changing market conditions. D.H. Vo *et al*. (2020) determined that derivatives are an effective tool for risk management in high inflationary environments. They conducted an analysis that showed that companies using financial derivatives were able to better adapt to inflationary challenges. This is consistent with the results of the current study, however, the author focused more on inflationary risks, while the current study looks at currency and interest rate risks.

The growing importance of derivatives in times of economic instability is particularly evident in the context of the war in Ukraine (Semenenko *et al*., 2024). The uncertainty of the exchange rate and fluctuations in interest rates highlight the need for hedging, which can be implemented using currency forwards and interest rate swaps. This creates new opportunities for Ukrainian companies to mitigate the risks associated with foreign economic activity. N.M. Leone *et al*. (2019) highlighted the use of derivatives in times of political instability. They noted that companies in underdeveloped and unstable countries are still not sufficiently aware of the use of derivatives to hedge political risks. This correlates with the findings of the current study, which also notes that many companies have limited experience in using these instruments. However, the author focuses more on political risks, while the current study also considers other types of risks, such as currency and interest rates.

G.M. Caporale *et al*. (2021) addressed the behaviour of investors in the derivatives market during economic instability. They conducted a comparative analysis of the use of derivatives in different regions of the world and concluded that investors tend to adopt different strategies during crisis periods. Compared to the current findings, the author not only examines specific instruments (futures, forwards, options, swaps) but also pays considerable attention to global trends and regional specifics, particularly in the context of the crisis.

The study also indicated that technological advances, such as the introduction of financial technology and blockchain, can significantly improve the efficiency of the derivatives market. Electronic platforms for trading derivatives can reduce the costs and time involved in executing trades, which can be critical in situations where the speed of response to changing market conditions is crucial. However, along with these advantages, new challenges arise related to the complexity of regulating new technologies. C. Chen (2020) studied the role of financial technology in the development of the derivatives market. The author noted that automation of trading and contract execution processes significantly increases market efficiency, reducing costs and time. E. Avgouleas & A. Kiayias (2019) also focused on the introduction of innovative technologies such as blockchain. The authors emphasised that blockchain-based smart contracts can provide security and transparency in the derivatives market by automatically fulfilling contract terms without intermediaries. This is consistent with current findings that also highlight the impact of fintech and blockchain on the availability and speed of derivatives transactions. However, the authors focused on the technical aspects and automation capabilities, while the current study focuses more on the regulatory and educational aspects.

G. Abuselidze (2021) addressed the specifics of the use of financial derivatives in the agricultural sector, where many export-oriented companies face currency risks due to

exchange rate fluctuations. The author conducted an analysis that demonstrated that agricultural companies actively use currency forwards as a tool to protect their revenues from adverse changes in the exchange rate. N.V. Trusova *et al.* (2020), in turn, emphasised that companies, thanks to forwards, can fix the selling price of their products at the stage of concluding a contract, which allows them to avoid financial losses in the event of a sharp drop in the currency exchange rate. This is consistent with the current findings, however, the authors emphasised that agricultural companies receive real benefits from the use of forwards, which have helped them to increase their financial stability. At the same time, the current study only focused on general awareness of financial instruments.

Financial literacy among Ukrainian companies remains a significant barrier to the effective use of derivatives. Despite growing awareness of hedging opportunities, many companies still have limited experience with financial instruments. This suggests the need for further training and awareness-raising among market participants. The regulatory framework in Ukraine also needs to be improved to facilitate the development of the derivatives market. While there are efforts by government authorities to create a more transparent and efficient infrastructure, this requires time and resources. Initiatives to attract foreign investors are also important, as they can provide additional capital and expertise to develop the market.

M.A. Al Janabi (2022) addressed the impact of regulatory changes following the 2008 financial crisis on the financial derivatives market, highlighting that the new requirements increased market transparency but created barriers for small and medium-sized enterprises. The study noted a decline in transaction volumes among small players, reflecting their inability to adapt to the new regulations. In contrast to the current study, the author emphasises structural changes and their implications for the availability of derivatives. The results of the author and the current study demonstrate the need for effective use of derivatives and attention to structural barriers that impede market access.

Overall, the findings of the study highlight that financial derivatives can be an important tool for risk management in Ukraine, but their effectiveness depends heavily on market awareness, technological support and the appropriate regulatory environment. In the face of ongoing economic challenges, such as the war, companies should actively use these instruments to ensure their financial stability. The authors' results also highlight the importance of financial derivatives in various aspects of risk management, and many of these findings overlap with the current study. The derivatives market is multifaceted and requires a comprehensive approach to analysing and using these instruments for risk management.

Conclusions

This study provides a detailed analysis of financial derivatives, their typology, evolution and role in modern markets. One of the key aspects of the study was the classification of derivatives by structure and underlying assets, which can be used to identify the main instruments: futures, forwards, options and swaps. Futures are recognised as standardised contracts that are widely used to hedge risks in commodity and financial markets. Forwards, in contrast to futures, provide greater flexibility, but due to the lack of standards, they carry higher risks. Options, which give the right but not the obligation to buy or sell assets, have proved to be the most flexible instrument for effective risk management. Swaps, in turn, help to reduce risks associated with interest rates and currency fluctuations by exchanging cash flows between the parties.

The evolution of derivatives has been influenced by market conditions, technological developments and regulatory changes. In particular, the importance of derivatives grew during the financial crises, as they developed into an effective hedge against market volatility. The development of derivatives markets was particularly important after the 2008 financial crisis, which led to increased regulation and the introduction of new requirements for transparency, clearing and risk management. The volume of derivatives trading on global exchanges increased between 2020 and 2023. The analysis noted that the latest technologies, including financial technology and blockchain, have a significant impact on the development of the derivatives market. Thanks to fintech, derivatives transactions have become more accessible and faster, while the use of blockchain increases the transparency and security of transactions. Automation of trading processes and the introduction of smart contracts reduce the costs and risks associated with contract execution. However, the study also highlighted that technological advances have their challenges, particularly in the areas of regulation and scalability of blockchain solutions.

In the context of the Ukrainian derivatives market, the study noted that their importance is growing due to constant economic fluctuations, currency risks and inflation, which is especially relevant in times of war. Ukrainian companies are increasingly using currency forwards and other derivatives to hedge their risks, but the country's derivatives market is still underdeveloped due to low financial literacy and a limited regulatory framework. Kernel's model of effective use of financial derivatives for risk management demonstrates how an agricultural company can use futures and options to hedge grain price risks. The use of these instruments allows Kernel to lock in prices for future sales, reducing the impact of unpredictable market fluctuations on revenue. By properly managing derivatives, the company can ensure the stability of its financial results and reduce the risks associated with fluctuations in commodity prices.

The limitations of the study are related to the lack of data on the specifics of the use of financial derivatives in Ukraine and the limited level of their implementation compared to developed countries. Further research could focus on analysing the impact of new technologies, such as blockchain, on the development of the derivatives market in Ukraine and exploring opportunities to improve financial literacy among market participants.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Abuselidze, G. (2021). Use of hedging instruments on example of grain market. In *20th international scientific conference engineering for rural development proceedings* (pp. 1655-1662). Jelgava, Latvia. doi: 10.22616/erdev.2021.20.tf359.

[2] Al Janabi, M.A. (2022). Transformation of derivatives securities in emerging markets: Policy implications in light of the 2007-2009 global financial crisis and COVID-19 pandemic. In *Financial transformations beyond the COVID-19 health crisis* (pp. 757-786). London: World Scientific Publishing Europe Ltd. doi: 10.1142/9781800610781_0026.

[3] Alsahlawi, A.M. (2021). The role of hedging and derivatives techniques and fintech adoption on financial risk management in Saudi Banks. *Cuadernos de Economía*, 44(126), 10-22.

[4] Analytical data on stock market development. (2024). Retrieved from https://www.nssmc.gov.ua/en/news/insights/.

[5] Avgouleas, E., & Kiayias, A. (2019). The promise of blockchain technology for global securities and derivatives markets: the new financial ecosystem and the 'holy grail' of systemic risk containment. *European Business Organization Law Review*, 20, 81-110. doi: 10.1007/s40804-019-00133-3.

[6] Babayev, N., & Sabzaliyev, S. (2024). Methods of financial assessment of the intellectual assets of an enterprise and features of their reflection in accounting. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(2), 9-17. doi: 10.52566/msu-econ2.2024.09.

[7] Balakrishnan, J. (2020). Hedging strategies used in selection of "options" and "forward" contracts in derivative market. *Journal of Commerce*, 8(1), 1-12. doi: 10.34293/commerce.v8i1.837.

[8] Balcilar, M., Gabauer, D., & Umar, Z. (2021). Crude oil futures contracts and commodity markets: New evidence from a TVP-VAR extended joint connectedness approach. *Resources Policy*, 73, article number 102219. doi: 10.1016/j.resourpol.2021.102219.

[9] Bartram, S.M. (2019). Corporate hedging and speculation with derivatives. *Journal of Corporate Finance*, 57, 9-34. doi: 10.1016/j.jcorpfin.2017.09.023.

[10] Bryan, D., & Rafferty, M. (2014). Financial derivatives as social policy beyond crisis. *Sociology*, 48(5), 887-903. doi: 10.1177/0038038514539061.

[11] Caporale, G.M., Karanasos, M., Yfanti, S., & Kartsaklas, A. (2021). Investors' trading behaviour and stock market volatility during crisis periods: A dual long-memory model for the Korean Stock Exchange. *International Journal of Finance & Economics*, 26(3), 4441-4461. doi: 10.1002/ijfe.2024.

[12] Carbonneau, A., & Godin, F. (2021). Deep equal risk pricing of financial derivatives with multiple hedging instruments. *ARXIV*. doi: 10.48550/arXiv.2102.12694.

[13] Chen, C. (2020). Regulation of derivatives in Asia: When technology meets financial engineering. In *Research handbook on Asian financial law* (pp. 101-121). Cheltenham: Edward Elgar Publishing. doi: 10.4337/9781788972208.00015.

[14] First Stock Trade System (PFTS). (2024). Retrieved from https://pfts.ua/en/1-about-pfts-se.

[15] Fu, S., Zhan, Y., Ouyang, J., Ding, Y., Tan, K.H., & Fu, L. (2021). Power, supply chain integration and quality performance of agricultural products: Evidence from contract farming in China. *Production Planning & Control*, 32(13), 1119-1135. doi: 10.1080/09537287.2020.1794074.

[16] González Pedraz, C., & Rixtel, A.V. (2021). *The role of derivatives in market strains during the COVID-19 crisis*. Madrid: Banco de España.

[17] He, Z., & Krishnamurthy, A. (2019). A macroeconomic framework for quantifying systemic risk. *American Economic Journal: Macroeconomics*, 11(4), 1-37. doi: 10.1257/mac.20180011.

[18] Kernel: Annual report. (2023). Retrieved from https://www.kernel.ua/wp-content/uploads/2024/02/FY2023_Kernel_Annual_Report.pdf#page=47.

[19] Kolbari, S. (2019). Investigating challenges and assessing managers' capabilities for risk management in small and medium-sized enterprises at the time of financial crisis in developing economies. *Revista Gestão & Tecnologia*, 19(1), 44-56. doi: 10.20397/2177-6652/2019.v19i1.1524.

[20] Kyfyak, V., Kindzerskyi, V., Todoriuk, S., Klevchik, L., & Luste, O. (2024). The role of economics and management in the development of sustainable business models of agricultural enterprises. *Scientific Horizons*, 27(6), 152-162. doi: 10.48077/scihor6.2024.152.

[21] Largest derivatives exchange worldwide from 2020 to September 2024, by number of contracts traded. (2024). Retrieved from https://www.statista.com/statistics/272832/largest-international-futures-exchanges-by-number-of-contracts-traded/.

[22] Leone, N.M., Manelli, N.A., & Pace, N.R. (2019). Commodity market and financial derivative instruments: Is there a cointegration. *Journal of Modern Accounting and Auditing*, 15, 185-202. doi: 10.17265/1548-6583/2019.04.002.

[23] Makedon, V., Krasnikova, N., Krupskyi, O.P., & Stasiuk, Y. (2022). Arrangement of digital leadership strategy by corporate structures: A review. *Ikonomicheski Izsledvania*, 31(8), 19-40.
[24] Manachynska, Yu., Luchyk, M., & Luchyk, S. (2024). Financial modelling of cash flow management for agribusiness security: Accounting and analytical aspect. *Scientific Horizons*, 27(4), 154-165. doi: 10.48077/scihor4.2024.154.
[25] Mosteanu, N.R., & Faccia, A. (2020). Digital systems and new challenges of financial management – FinTech, XBRL, blockchain and cryptocurrencies. *Quality – Access to Success*, 21(174), 159-166.
[26] Nogoibaeva, E., Mamatova, N., Derkenbaeva, S., & Omurzakova, U. (2024). Integrated approach to risk analysis in financial statements to ensure economic security of the enterprise. *Economics of Development*, 23(2), 17-26. doi: 10.57111/econ/2.2024.17.
[27] Oliinyk, V.M., Burdenko, I.M., Volynets, O., & Yatsenko, V.V. (2019). Organized derivatives market and economical growth: Relationship and impact. *Periodicals of Engineering and Natural Sciences*, 7(2), 806-817.
[28] Pauletto, C. (2012). *The history of derivatives: A few milestones*. Retrieved from https://www.scribd.com/document/583371632/HistoryofDerivatives-AfewMilestonesKummerandPauletto.
[29] Schwarcz, S.L. (2020). Regulating derivatives: A fundamental rethinking. *Duke Law Journal*, 70(3), 545-606.
[30] Semenenko, O., Dobrovolskyi, U., Vasylenko, S., Yarmolchyk, M., & Tarhonskyi, V. (2024). Risks of managing financial resources of the agricultural sector of Ukraine in the zone of military conflict: Challenges, threats, ways of counteraction. *Ekonomika APK*, 31(3), 65-75. doi: 10.32317/2221-1055.2024030.75.
[31] Seo, S.B., & Wachter, J.A. (2019). Option prices in a model with stochastic disaster risk. *Management Science*, 65(8), 3449-3469. doi: 10.1287/mnsc.2017.2978.
[32] Shuplat, O., Shevchenko, V., Lutsiv, N., Nekrasov, S., & Hovda, H. (2022). Financing the fixed assets reproduction of woodworking enterprises: Innovation and investment aspect. *Financial and Credit Activity: Problems of Theory and Practice*, 4(45), 48-57. doi: 10.55643/fcaptp.4.45.2022.3801.
[33] Slobodianyk, A.N., Reznik, N.P., & Abuselidze, G.D. (2021). The analysis of hedging instruments on the exchange commodity market of Ukraine. In *The challenge of sustainability in agricultural systems* (pp. 379-385). Cham: Springer. doi: 10.1007/978-3-030-73097-0_42.
[34] Sosoo, V.E., Okorie, D.I., & Chen, H. (2021). Roles of commodity futures derivatives and financial crises in global food security. *Economic and Political Studies*, 9(3), 336-357. doi: 10.1080/20954816.2021.1872854.
[35] Spytska, L. (2023). Prospects for the legalization of cryptocurrency in Ukraine, based on the experience of other countries. *Social and Legal Studios*, 6(4), 226-232. doi: 10.32518/sals4.2023.226.
[36] Tarullo, D.K. (2019). Financial regulation: Still unsettled a decade after the crisis. *Journal of Economic Perspectives*, 33(1), 61-80. doi: 10.1257/jep.33.1.61.
[37] Trusova, N.V., Tanklevska, N.S., Synchak, V.P., Prystemskyi, O.S., & Tereshchenko, M.A. (2020). State support of agro-insurance of agricultural risks in the market of goods derivatives of Ukraine. *Industrial Engineering & Management Systems*, 19(1), 93-102. doi: 10.7232/iems.2020.19.1.093.
[38] Ukrainian exchange. (2008). Retrieved from https://www.ux.ua/s111.
[39] Vo, D.H., Huynh, S.V., Vo, A.T., & Ha, D.T.T. (2019). The importance of the financial derivatives markets to economic development in the world's four major economies. *Journal of Risk and Financial Management*, 12(1), article number 35. doi: 10.3390/jrfm12010035.
[40] Vo, D.H., Van Nguyen, P., Nguyen, H.M., Vo, A.T., & Nguyen, T.C. (2020). Derivatives market and economic growth nexus: Policy implications for emerging markets. *The North American Journal of Economics and Finance*, 54, article number 100866. doi: 10.1016/j.najef.2018.10.014 .
[41] Vuillemey, G. (2019). Bank interest rate risk management. *Management Science*, 65(12), 5933-5956. doi: 10.1287/mnsc.2018.3125.
[42] Yu, Y., Yang, X., & Lei, Q. (2022). Pricing of equity swaps in uncertain financial market. *Chaos, Solitons & Fractals*, 154, article number 111673. doi: 10.1016/j.chaos.2021.111673.
[43] Zelisko, N., Raiter, N., Markovych, N., Matskiv, H., & Vasylyna, O. (2024). Improving business processes in the agricultural sector considering economic security, digitalization, risks, and artificial intelligence. *Ekonomika APK*, 31(3), 10-21. doi: 10.32317/2221-1055.2024030.10.
[44] Zhang, S., Tang, J.A., Hu, Q., & Liu, F. (2020). Research on blockchain financial derivatives cluster. In *Proceedings of the 2020 3rd international conference on blockchain technology and applications* (pp. 40-46). New York: Association for Computing Machinery. doi: 10.1145/3446983.3446996.

Аналіз використання фінансових деривативів для управління ризиками в умовах нестабільності на фінансових ринках

Ганна Ткачук
Кандидат економічних наук
Державний університет «Житомирська політехніка»
10005, вул. Чуднівська, 103, м. Житомир, Україна
https://orcid.org/0000-0001-6188-3028
Ігор Бурачек
Кандидат економічних наук
Державний університет «Житомирська політехніка»
10005, вул. Чуднівська, 103, м. Житомир, Україна
https://orcid.org/0000-0003-0549-6917
Володимир Виговський
Кандидат економічних наук
Державний університет «Житомирська політехніка»
10005, вул. Чуднівська, 103, м. Житомир, Україна
https://orcid.org/0000-0001-5642-0774
Анжеліна Сотник
Кандидат економічних наук
Державний університет «Житомирська політехніка»
10005, вул. Чуднівська, 103, м. Житомир, Україна
https://orcid.org/0000-0002-0217-988X
Ірина Царук
Кандидат економічних наук
Державний університет «Житомирська політехніка»
10005, вул. Чуднівська, 103, м. Житомир, Україна
https://orcid.org/0000-0002-9628-3257

Анотація. Дане дослідження направлене на аналіз можливостей та ефективності застосування фінансових деривативів як інструментів для хеджування та мінімізації ризиків на фінансових ринках. Методологія дослідження включала класифікацію фінансових деривативів за різними критеріями, зокрема за їхньою структурою та базовими активами. Визначено основні типи деривативів: ф'ючерси, форварди, опціони та свопи, що використовуються для хеджування ризиків на ринках товарів і фінансових інструментів. Результати дослідження свідчать про те, що фінансові деривативи займають важливу роль у зниженні впливу негативних змін на ринку, відкриваючи нові можливості для інвесторів та компаній у контексті хеджування, спекуляцій і арбітражу. Визначено, що еволюція фінансових деривативів значною мірою була зумовлена необхідністю адаптації до постійно змінюваних умов ринку, особливо під час криз і періодів волатильності. Робота також досліджує вплив фінансових технологій (fintech) і блокчейн-технологій на ринок деривативів, підкреслюючи важливість автоматизації та підвищення прозорості угод. Відзначено, що останніми роками ринок деривативів зазнав значних змін через впровадження нових технологій, які поліпшили доступність та швидкість торгівлі. Окрему увагу приділено аналізу українського ринку деривативів, де економічна та політична нестабільність створює потребу в ефективному управлінні ризиками. Окремим елементом дослідження була розробка моделі ефективного використання фінансових деривативів для управління ризиками на прикладі Kernel. Модель включала етапи оцінки ризиків, вибору відповідних фінансових інструментів, а також здійснення моніторингу та коригування стратегій. Висновки дослідження підкреслюють, що ринок деривативів в Україні ще перебуває на етапі розвитку, що пов'язано з обмеженим розумінням цих інструментів серед учасників ринку

Ключові слова: хеджування; валютні коливання; блокчейн; економічна стабільність; процентні ставки

Scientific Bulletin
of Mukachevo State University
Series
Economics

Volume 11, No. 4, 93-105
Journal homepage: https://economics-msu.com.ua/en

UDC 349.3:368.914
DOI: 10.52566/msu-econ4.2024.93

Central Asian pension systems: A comparative analysis of achievements, risks and development mechanisms

Bakhtiyar Aliev*

Doctoral Student
Musa Ryskulbekov Kyrgyz Economic University
720033, 58 Togolok Moldo Str., Bishkek, Kyrgyz Republic
https://orcid.org/0009-0002-0477-5391

Tolobek Kamchybekov

Doctor of Economics, Professor
Musa Ryskulbekov Kyrgyz Economic University
720033, 58 Togolok Moldo Str., Bishkek, Kyrgyz Republic
https://orcid.org/0000-0003-2561-3316

Dzhumabek Dzhailov

Doctor of Economics, Professor
Institute of State and Law National Academy of Sciences Kyrgyz Republic
720010, 265A Chui Ave., Bishkek, Kyrgyz Republic
https://orcid.org/0000-0002-0840-3440

Shanning Fu

Doctoral Student
Jusup Balasagyn Kyrgyz National University
720033, 547 Frunze Str., Bishkek, Kyrgyz Republic
https://orcid.org/0009-0007-3280-7991

Abstract. The purpose of this study was to analyse the pension systems of Central Asian countries to evaluate the effectiveness of pension reforms and identify key challenges impacting their financial sustainability. The study focused on the impact of labour migration, informal employment and demographic changes on the pension systems of these countries. A comparative analysis was conducted to assess the pension systems based on key indicators such as pension

Received: 11.09.2024, Revised: 05.12.2024, Accepted: 27.12.2024

Suggested Citation: Aliev, B., Kamchybekov, T., Dzhailov, D., & Fu, Sh. (2024). Central Asian pension systems: A comparative analysis of achievements, risks and development mechanisms. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 93-105. doi: 10.52566/msu-econ4.2024.93.

*Corresponding author

fund contributions, demographic trends, and the structure of pension models – pay-as-you-go, funded, or hybrid. The results of the study showed significant differences between the pension systems of Central Asian countries. Kazakhstan had introduced a funded pension system, but was facing problems due to low investment returns and public distrust. Uzbekistan, despite efforts to integrate migrant workers into the pension system, still struggles with insufficient contributions from the informal sector. Turkmenistan maintains a public pension system, but a lack of transparency limits the ability to assess its long-term viability. Kyrgyzstan has introduced a hybrid pension system, but labour migration and the informal economy undermine its effectiveness. Tajikistan continues to rely on the traditional pay-as-you-go model, but economic instability and migration pose serious financial challenges. Thus, pension systems in Central Asia share common challenges, especially in managing labour migration and covering informal workers. Ongoing reforms are needed to improve financial management, diversify investments, and expand coverage to ensure the sustainability of pension funds

Keywords: demographic challenges; retirement benefits; social security; financial sustainability; welfare state

Introduction

Pension systems play a crucial role in providing financial security for the elderly after retirement. In Central Asia, these systems have a long history but have faced challenges during the post-Soviet transition. A detailed analysis of pension reforms, demographic shifts, population aging, and financial sustainability is needed to ensure effective pension payments. Comparing the systems in Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, and Tajikistan will help identify successes, risks, and strategies for improving social security.

The financial sustainability of Central Asian pension systems faces challenges from economic inequality, limited state budgets, and an aging population. Unequal economic development and resource constraints threaten the efficiency of these systems. Reforms and new funding sources are crucial for long-term sustainability, especially amid global economic changes (Cheberyako & Skulish, 2022). Research on the effectiveness of current strategies, risks, and achievements is vital for academics and policymakers, as pension systems directly affect the quality of life for millions in the region.

Uzbekistan's pension system faces challenges, including a growing number of retirees and low contributions from less than half of the workforce. U.U. Berdiyeva (2022) explored international reforms and suggested involving migrants and informal workers to enhance sustainability. However, more research is needed on ensuring pension fund viability and encouraging long-term participation in social insurance.

Asian pension systems struggle with poor coverage and inadequate benefits due to aging populations and reduced family support. D. Park & G.B. Estrada (2022) noted that only the Philippines provided sufficient pension income, while most countries offered benefits that fell short of a decent living standard. Research gaps include expanding coverage for unorganized sector workers and ensuring the financial sustainability of these systems.

Kazakhstan's pension system, modelled on the Soviet system, faces significant financial challenges due to the economic downturn and difficulties in paying retirees (Khamzin *et al*., 2015). Asian Development Bank (2023) highlighted key issues, such as the need to build public trust, improve fund management, and strengthen capital markets. Gaps for further investigation include mechanisms to ensure minimum pensions and address income redistribution for social justice.

Demographic shifts, such as an aging population and low coverage, have undermined the financial sustainability of Central Asian pension systems. The financial instability of the Kyrgyz Republic's pension system is driven by high labour migration, low pension contributions, and an aging population. D.S. Zholboldueva *et al*. (2024) found that while the funded pension system has reduced the deficit, issues with covering the unorganized sector and labour migrants persist. Key gaps include exploring strategies to attract migrants and ensuring the system's financial stability.

Low pension payments and economic instability brought on by inflation and labour migration are major problems for the aged population in Central Asia. K. Makhanov (2024) highlighted that the region's pensioner provision was negatively impacted by reliance on remittances. The effectiveness of government initiatives to expand social benefits is still quite low. Not enough research has been done on the problems of long-term care for the elderly in light of the drop in remittances.

Asia's pension systems face challenges, particularly low coverage and inadequate benefits, as highlighted by R. Chomik *et al*. (2024), especially in countries with high informal work. They emphasize that low voluntary contributions and informality pose major obstacles. Research gaps include ineffective strategies for raising benefit levels amid demographic changes and integrating informal workers into the system.

The authors identify key challenges in the Kyrgyz Republic's pension system, such as labour migration and low pensioner incomes due to insufficient coverage of unorganized sector workers. Work by House of Commons Foreign Affairs Committee (2024) highlights the system's financial instability caused by inadequate migrant contributions and low pension payments. The primary gap is the need to create strategies for attracting migrants to the pension system and strengthening the legal framework for recognizing their contributions.

The purpose of the study was to identify effective mechanisms for improving the pension systems of Central Asian countries to ensure their financial stability and social protection of the elderly. To achieve this goal, it was

necessary to solve the following tasks: first, to analyse existing pension models in Central Asian countries and identify their strengths and weaknesses; second, to study the impact of labour migration on the stability of pension systems and develop recommendations for increasing the coverage of informal sector workers.

Materials and Methods

This study analysed in depth the pension systems of five Central Asian countries – Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan and Tajikistan. Covering the period 2019-2023 years, the study provided an up-to-date and detailed comparison of the pension systems of these countries, with the aim of identifying both good practices and areas for improvement. The analysis took into account the different socio-economic conditions of each country, demographic challenges and peculiarities of employee participation in pension systems, which provided a holistic view of the state of pension systems in Central Asia.

Data for the analysis was meticulously gathered from official government reports, publications by international organizations, and statistics from national agencies across each country. Key sources included detailed, insightful reports from the World Bank (2019) and the Asian Development Bank (2023). This collected data encompassed the structural elements of each pension system, levels of employee contributions, demographic patterns, and key economic indicators, including pension fund performance metrics and trends.

The study used the following main methods of scientific knowledge: analysis and synthesis, which allowed to break down the structure of pension systems into their components and further generalise the data obtained to identify common trends and differences; induction and deduction, which were used to formulate general conclusions based on specific data, as well as to logically justify recommendations for improving pension systems; comparative method, which allowed to identify common and distinctive features of the pension systems of the five countries, and assess the effectiveness of reforms in different socio-economic conditions.

In addition, the descriptive method was used to systematise the characteristics of each pension system, including demographic trends, the level of employee participation in pension systems and economic indicators; the synthesis method helped to develop recommendations for further reforms aimed at improving the financial sustainability of pension funds and expanding the coverage of the population with pension benefits.

A significant focus was placed on assessing the impact of labour migration on pension systems. For each country, data regarding migration rates and the level of migrant participation in pension systems were analysed. This allowed the study to evaluate how migration influences the financial sustainability of pension funds and to assess the effectiveness of policies designed to integrate migrants into social protection frameworks. The research findings were presented through tables and graphs, providing a clear visual comparison of reform outcomes, the scope of pension coverage, and each system's financial resilience. This visualization aided in identifying the most effective strategies and highlighting areas for further development in pension management.

Results

Although the Central Asian nations of Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, and Tajikistan inherited Soviet-style pension systems, each of them started enacting its own pension reforms in the post-Soviet era to adjust to the changing circumstances. Although the region's pension systems are still developing, they all deal with the same issues, including shifting demographics, minimal employee engagement in the unorganized sector, and a lack of funding.

After 1998, Kazakhstan's pay-as-you-go pension system was replaced by a funded pension scheme. Employee contributions to pension funds, which are meant to pay benefits upon retirement, are the primary focus. Despite its goal of lessening the strain on the state budget, this system has several problems, such as the public's mistrust of pension funds as a result of corruption and subpar investment results. Furthermore, a sizable section of the working population migrates overseas or works in the unorganized sector, thus the system does not include everyone.

A financed pension system has also been established in Uzbekistan, although there are many obstacles in the way of its complete implementation. Since a sizable section of the populace is employed in the unorganized sector, it is challenging to integrate these individuals into the pension system. This results in a lack of contributions and a restricted capacity to offer a respectable standard of pensions to the whole population. Furthermore, the system is experiencing financial sustainability problems that raise doubts about its long-term efficacy as a result of demographic shifts and economic challenges.

Since Turkmenistan is still a relatively remote nation, it is challenging to obtain reliable data on the success of pension reforms, even with the implementation of financed pillars in the system. Although the state budget still has a significant influence on pension payouts, the lack of transparency makes it challenging to evaluate how well the system can support pensioners' standard of life. Official statistics, however, show a steady level of payments, even if the real situation might be very different.

Kyrgyzstan has decided to use a hybrid pension scheme that incorporates funded and pay-as-you-go components. Through private pension funds, this strategy enables the government to lessen the strain on the state budget to some extent. However, it ignores the fundamental issue of low pension fund contributions brought on by increasing migration and poor participation from workers in the unorganized sector. The high degree of shadow economy in Kyrgyzstan's pension system also severely restricts the country's ability to pay retirees steady pension payouts (World Bank, 2019).

In contrast to its neighbours, Tajikistan still uses the traditional pay-as-you-go pension system, in which current contributions from working people are used to fund

pension payouts. However, because of the nation's economic instability, this model – which worked successfully under the Soviet era – is currently having serious financial challenges. This system is susceptible to shifts in the economy because of low earnings, a high number of labour migrants, and insufficient pension fund resources. Because of this, the majority of Tajik retirees receive extremely meagre pensions that fall short of meeting their basic needs.

Financial instability brought on by demographic and economic shifts, low trust in pension funds, and inadequate coverage of workers – particularly in the informal sector – are issues that all Central Asian nations face. This is compelling governments to find new ways to guarantee pension systems' financial viability and enhance post-retirement living standards. To better understand the main achievements and challenges of the pension systems of Central Asian countries, it is worth comparing their models and the results of the reforms implemented. Each country has taken different approaches to addressing the challenges faced by their pension systems, depending on demographic, economic, and social factors. Table 1 presents a comparative analysis of the pension systems of Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, and Tajikistan, including major achievements and key challenges.

Table 1. Comparative table of pension systems in Central Asia

Country	Pension system type	Main achievement	Main challenge
Kazakhstan	Accumulation	Individualized pension payments, reduced budget load	Lack of trust in pension funds, limited informal sector coverage
Uzbekistan	Accumulation	Stabilization efforts, partial coverage of informal sector	Low contributions from informal sector, limited financial resources
Turkmenistan	Mixed	State-backed stability with elements of accumulation	Lack of transparency, economic isolation
Kyrgyzstan	Mixed	Balanced burden between state and private funds	High migration, low contributions from informal sector
Tajikistan	Distribution	Stable payouts based on current contributions	Economic instability, low pension payouts

Source: developed by the authors based on World Bank (2019; 2020) and the Asian Development Bank (2023)

The overall analysis shows that each of the Central Asian countries has made unique progress in reforming their pension systems. However, common challenges include the lack of coverage of informal sector workers, problems with trust in pension funds, and economic instability. Further reforms and improvements to pension fund management systems in each country are needed to ensure long-term financial stability and social protection.

One important aspect influencing the stability of Central Asian pension systems is labour migration. The majority of economically active people in the majority of the region's countries work overseas, which has a big impact on pension fund contributions and the systems' overall financial soundness. Even though Kazakhstan is the most economically developed nation in the region, migration has an impact on the pension system because some of the population migrates abroad for work, which lowers pension fund contributions. However, because of the country's stable economy and thriving domestic sector, this impact is less severe than in other nations.

Since a sizable portion of the economically active population in Uzbekistan works abroad, migration has a greater effect on the pension system there. This results in fewer contributions to the pension fund and a major financial shortfall. Labour migration has less of an effect on Turkmenistan's pension system because of the nation's relative isolation, while the government works to keep the system stable with local funding. One of the biggest problems facing Kyrgyzstan's pension system is migration, since a sizable portion of the country's economically active population works abroad, which results in a sizable deficit in pension fund contributions.

The majority of migrants do not make contributions to pension systems in their home countries, the migration of labour abroad causes a significant shortfall of financial resources in the pension system in Tajikistan, just as it does in Kyrgyzstan. Migration reduces pension fund contributions, which threatens the financial stability of all Central Asian nations. Kyrgyzstan and Tajikistan are particularly affected, as a sizable section of their populations work abroad and do not make contributions to national pension systems, endangering the ability to provide adequate pensions in the future and necessitating the creation of new mechanisms by governments to include migrant workers in pension programs.

Pension reforms are significantly impacted by migration, particularly in nations with high labour migration rates, such those in Central Asia (Alishli *et al.*, 2024). Since a significant portion of the economically active population works outside and does not participate to the national pension system, one of the primary effects of migration is a decline in the number of pension fund contributions. This results in a deficit in pension funds and makes it challenging to pay pensioners, necessitating adjustments to the pension system's financial model. Furthermore, because migrants do not make contributions, the burden is placed on those who stay in the nation, resulting in an unequal distribution of the economic burden. Another significant factor is

changes in the demographic composition, as young people's movement lowers the number of persons in working age and raises the number of retirees. The pension system is under more strain as a result, and changes are needed to discover new financing sources.

Since it is hard to foresee how many migrants will return home and whether they will make contributions to the pension system, migration further complicates long-term planning for pension reforms. This necessitates adaptability in reforms and the pursuit of novel ways to involve migrants in national pension schemes. Remittances from overseas can support pensioners and their families to some extent, but they are not a sustainable source of funding for the pension system. The necessity of reaching international agreements that would let migrants to make contributions to their home country's pension system while they are overseas is another crucial element (Gazilas, 2024). In nations with significant migratory populations, this could contribute to the financial stability of pension funds. Given the demographic and economic difficulties brought on by labour outflows, labour migration is a significant element that necessitates those nations, particularly those in Central Asia, revaluate their approaches to pension reforms.

In nations with significant labour migration rates, as those in Central Asia, donations from migrants are crucial to the establishment of pension systems. However, the majority of the time, foreign workers do not make contributions to their home nations' national pension plans. This is because many nations lack the systems necessary to include these workers into domestic pension plans. The financial stability of pension funds is weakened as a result of the large revenue losses.

The social insurance system, which is the primary source of pension money, is not used by migrants because the majority of them labour outside of the official national economy. Because fewer active employees are contributing to the system on a regular basis, this condition results in shortfalls in pension funds. This is particularly true in nations like Kyrgyzstan and Tajikistan where a sizable portion of the populace migrates in search of employment.

Due to their failure to make payments, migrants are also at a disadvantage when it comes time for them to retire because they have not accrued pensionable service in their home countries. In order to engage migrants in national pension systems, governments must create new policies and mechanisms. For example, they may establish opportunities for voluntary contributions or reach international agreements that permit migrants to make contributions to the system in their home country while working overseas.

So, migrant contributions have a lot of potential to sustain pension funds, but national pension systems face serious financial difficulties if they stop coming. To ensure the financial sustainability of pension funds, countries need to integrate migrant workers into the social insurance and pension contribution system, which will help strengthen the financial base of the systems and ensure adequate pension benefits in the future.

As the biggest economy in Central Asia, Kazakhstan has implemented major pension changes to strengthen the system's financial stability and adjust it to the current economic climate. The implementation of a funded pension system in the early 2000s was one of the crucial phases. Employees are required to make individual payments to private pension funds under this scheme. The reform's primary objectives were to guarantee reliable pension payment financing and lessen the pension system's reliance on the state budget (Schiff *et al*., 2001).

Official data indicates that the funded system's implementation has greatly improved pension funds' accountability and transparency. The expansion of pension assets is facilitated by their investments in different economic areas. Nevertheless, there have been several obstacles to this reform's efficacy. The public's lack of trust in private pension funds as a result of corruption and poor investment efficiency was one of the issues. As a result, several people preferred unofficial savings to pension fund contributions.

However, by enacting new laws meant to increase oversight of pension fund operations, the Kazakh government has attempted to increase the effectiveness of the financed system. There are now additional criteria for investment transparency and asset management. Although the number of contributions to the funds is still less than anticipated, this did help to some degree to rebuild public confidence.

The goal of Uzbekistan has been to gradually modernize its pension system. The shift to a financed system with social insurance components was the primary change carried out by the government in the early 2000s. The goal of this concept was to balance the public and private financing of pensions by combining the ideas of a pay-as-you-go system with personal savings (World Bank, 2020).

The progressive expansion of social security for the populace, especially for public sector workers, was one of the reform's primary accomplishments. The government established more incentives for workers in the unorganized sector to contribute to the system, and pension payments were stabilized. The capacity of the pension system is constrained by the fact that a sizable section of the population of Uzbekistan still works in the unorganized sector.

However, the financed system has come under fire for providing pension funds with little investment options. Pension assets are primarily invested in domestic government bonds due to the lack of developed financial markets in the nation, which restricts their returns. Expanding investment opportunities overseas is one way the government is attempting to solve this issue, but complete integration into international financial markets will take time.

Reforms to the pension system have been more conservative in Turkmenistan. The underlying paradigm has remained pay-as-you-go, with pensions paid by current contributions from working persons, even if the government has adopted some aspects of a funded system. Because Turkmenistan has a robust state economy and no access to international markets, the government still has authority over the pension system.

This model's effectiveness is in the government's ability to maintain a steady level of pension payments for the populace in spite of changes in the economy. The issue is that it is challenging to evaluate the system's actual effectiveness due to the opaqueness of pension fund financing. Public trust in the system is weakened by the absence of information on the income and investments made by pension funds.

Furthermore, the development of financial markets and investment options that could raise the return on pension assets are constrained by the nation's economic isolation. Reforms in this sector must be implemented in order to increase the system's efficiency, but the nation is not in a rush to alter the current model because of the political climate.

In an effort to increase the system's financial sustainability, Kyrgyzstan, one of the region's poorest nations, has enacted a number of pension reforms. The primary action was the switch to a mixed pension scheme, which incorporates aspects of funded and pay-as-you-go plans. By using this strategy, the government has been able to draw in private pension funds to finance pensions while also lessening the strain on the public budget (Organisation for Economic Co-operation and Development, 2015).

The changes have encountered difficulties in spite of certain achievements. One of the biggest threats to the pension system's financial stability is the high rate of worker migration. Contributions to pension funds are restricted since a sizable portion of the working-age population is employed abroad. Furthermore, a sizable portion of the economy is still unorganized, which lowers employee involvement in the pension system. As a result, the Kyrgyz government has implemented several policies to promote pension fund payments, such as tax breaks for business owners and unorganized sector employees. The country's economic situation prevents the pension system from fully covering the population, therefore the effectiveness of these measures is still restricted.

The conventional pay-as-you-go pension system, which is funded by current contributions from working residents, has been maintained in Tajikistan. The primary goals of the reforms were to raise the population's degree of social protection and enhance the way pension payments were administered. Although the government has taken steps to improve pension fund management, the primary issue is still a lack of adequate funding. Tajikistan's pension system is significantly impacted by labour migration as well. The majority of people in their working years are employed overseas and do not make contributions to national pension schemes. As a result, there are insufficient funds available to pay pensions. By developing pensioner support programs and luring in foreign aid, the Tajik government is attempting to address this issue.

Due to a weak economic foundation and high labour mobility, Tajikistan's pension system reforms have not been very successful despite these attempts. The government must to be searching for fresh approaches to funding the pension system, such as potential.

Pension reforms in Central Asian countries have become an important step towards ensuring social protection in the face of economic and demographic instability. Faced with a number of challenges, such as an aging population, high labour migration, and dependence on the informal sector, governments in these countries have implemented various reform models aimed at strengthening their pension systems. Each country has taken its own approach to modernizing the pension system, which is reflected in the outcomes of the reforms and their impact on the sustainability of benefits. Table 2 compares the main reforms, their positive and negative aspects, and their impact on the sustainability of pension benefits in Central Asia.

Table 2. Comparing the outcomes of reforms and their effects on Central Asia's pension benefit sustainability

Country	Key reform	Positive impact	Negative impact	Overall pension stability
Kazakhstan	Introduction of funded system	Increased transparency, investment opportunities	Distrust in pension funds, low fund profitability	Relative stability, pension growth
Uzbekistan	Funded system with social insurance elements	Improved social protection level	High informal economy, limited investment opportunities	Partial stability, dependence on state budget
Turkmenistan	State distribution system	Stability of payments through state support	Lack of transparency, limited investments	Stability, lack of data on long-term prospects
Kyrgyzstan	Mixed system (funded + distribution)	Reduced budget pressure, involvement of private funds	High labour migration, informal sector	Instability due to low contributions, reliance on private funds
Tajikistan	Preservation of distribution system	Administrative reforms, support for the pension fund	Lack of financial resources, labour migration	Low stability, dependence on external factors

Source: developed by the authors developed by the authors based on World Bank (2019; 2020) and the Asian Development Bank (2023)

Although Kazakhstan has implemented a funded system, it has faced a number of challenges related to the effective management of pension funds and low levels of public trust. However, analysing 2019-2023 years, it is worth noting that the state has gradually begun to use pension assets more actively to support strategic sectors of the economy,

such as energy and transportation. This helped to strengthen national reserves and ensure economic growth during the COVID-19 pandemic. Although this has increased risks, as investments in public projects reduce the level of asset diversification, the effectiveness of such decisions can only be assessed in the long run. Reforms have also contributed to the introduction of new digital mechanisms that allow citizens to track their pension assets online, which has increased transparency.

Uzbekistan has begun to expand international investment opportunities to improve the returns of pension funds. New arrangements with foreign investors and the implementation of a number of financial sector reforms have enabled the government to gradually increase the amount of foreign investment invested in pension assets. These steps are important for the long-term sustainability of the pension system. In addition, Uzbekistan has begun to enter into bilateral agreements with other countries to ensure that migrant workers are eligible for pensions even when they work abroad. This process is aimed at reducing losses to the pension system due to labour migration, as many workers do not contribute to national pension funds while working abroad.

Because of the state's strong economic impact, pension payments in Turkmenistan remain stable. Turkmenistan is not in a rush to change its pension system, nevertheless, in contrast to its neighbours. It's crucial to remember that Turkmenistan's state control over energy exports enables it to generate steady income for the national budget, which in turn enables it to fund pensions. At the same time, the pension system has few prospects for growth and long-term stability because of the opaqueness of pension fund financing and the nation's economic isolation. There are very few reforms intended to improve the efficiency of pension asset investments.

Stabilizing the pension system has proven to be extremely difficult for Kyrgyzstan. Because of the high rate of informal work, a sizable portion of the population is still not covered by social insurance, even after the implementation of a hybrid pension system. Additionally, labour migration is one of the main issues. By developing digital platforms that enable migrant workers to make pension payments from overseas, the government has been implementing new initiatives in recent years to draw migrants to the pension system. Since many migrants lack steady jobs and are unable to contribute on a regular basis, these programs' efficacy is still low.

Tajikistan's national pension system is vulnerable since it still depends on remittances from labour migrants. Although the government has made a number of reforms in recent years to enhance the management of the pension system, a significant obstacle still exists in the shape of an unreliable source of money. In order to guarantee payments to the national pension system, the administration is also thinking about negotiating bilateral agreements with the nations where Tajiks emigrate. However, this problem is challenging to address because a sizable portion of the populace lacks access to the formal employment sector.

Therefore, depending on the degree of economic development, access to global financial markets, and the efficiency of local institutions, the outcomes of pension reforms in Central Asian nations exhibit notable variations. Although Kazakhstan has stabilized its pension system the most through a funded approach, issues with investment performance and credibility still exist. The sustainability of their pension systems is impacted by fundamental problems that other nations, like as Kyrgyzstan and Uzbekistan, are still facing. Both Tajikistan and Turkmenistan continue to use conventional methods for paying pension payments, but they both struggle with a lack of transparency and few long-term investment options.

Discussion

Comparing the results of this study with A. Tolymbek (2022), both agree that Kazakhstan's funded pension system faces serious challenges, including low returns on assets and the impact of inflation on real benefits. Both studies highlight that the system does not generate enough revenue to sustain adequate future pensions. Issues with pension asset investment and weak regulation are also noted as key concerns. Author suggested additional income sources through private investments and group programmes, aligning with this study's emphasis on diversifying pension sources. Differences arose in the solutions: A. Tolymbek (2022) proposed using Canada's three-pillar pension model, while this study focused more on the unique challenges in Central Asia, like migration and informal employment, which limited the adoption of such models. Both studies stress the need for stronger regulation and increasing trust in pension funds, though this analysis is more region-specific, while A. Tolymbek's offers broader, international approaches.

A. Bekbossinova *et al*. (2023) analysed the impact of economic, social, and investment factors on retirement savings in Kazakhstan, emphasizing, like this study, the importance of contributions as key to pension savings. Both studies highlight those contributions significantly impact asset accumulation, and both recognize inflation's negative effect on real pension benefits, reducing purchasing power. However, the focus differs: A. Bekbossinova *et al.* (2023) study paid more attention to social factors, like average wages and the number of pension participants, which drove asset growth. In contrast, this study focused more on demographic issues like labour migration, which affected contributions. The scientists also considered investment income less important, while this study gave more weight to investment efficiency and financial stability. While both studies agreed on the importance of contributions and inflation, A. Bekbossinova *et al.* (2023) study leaned toward social aspects, whereas this study emphasised economic factors, investment risks, and demographic challenges.

In the study by G.A. Junusbekova & M.D. Zhaumitova (2020), it was analysed the efficiency of Kazakhstan's pension system with a focus on the impact of macroeconomic factors on its functioning. As in this study, the authors em-

phasized the importance of balancing the pay-as-you-go and funded components of the pension system. They noted that the efficiency of the system was achieved through a combination of state, pay-as-you-go, and funded elements, which was consistent with the findings of this study on the importance of a multi-pillar approach to pension provision. At the same time, their study paid special attention to the impact of the labour market on the pension system, which was not the main focus of this analysis. In addition, they emphasized specific performance indicators such as replacement rates and growth rates of real and nominal pensions, while this study focused more on socioeconomic factors, including inflation and demographic changes. However, both studies agreed that a funded system was key to reducing the burden on the state budget in the context of an aging population. The differences were that the G.A. Junusbekova & M.D. Zhaumitova (2020) study focused more on the technical aspects of pension asset management and forecasting system performance based on market indicators, while the present study focused on migration and social inequality.

E. Palmer (2007) analysed Kazakhstan's pension reform, in particular its transition to a funded system, which had been introduced in 1998. He drew attention to the problems of the old pay-as-you-go system, where pensions were calculated on the basis of salary and length of service, and noted that this system became financially unstable after the collapse of the Union of Soviet Socialist Republics. His research showed that the pension reform was intended to reduce pressure on the state budget and encourage citizens to save. The study confirmed that the reform of Kazakhstan's pension system had a positive impact on the stability of the system, particularly through the introduction of the funded pillar. However, like findings by E. Palmer (2007), this analysis also emphasized that insufficient coverage of the informally employed and low pension contributions remained a serious problem. The differences were that The differences were that study by Palmer (2007) focused more on the macroeconomic impact of the reform and structural changes in the financial system, while this analysis focused more on social aspects, such as the impact on social protection and the welfare of pensioners.

S. Mirzoev (2022) analysed Tajikistan's pension system, particularly the financial difficulties due to insufficient contributions and high levels of informal employment. As in the present study, S. Mirzoev (2022) emphasized the need to expand the coverage of the social security system and make changes to improve its financial sustainability. The studies agreed on the problems of low pension contributions and insufficient coverage of informal workers. However, S. Mirzoev (2022) focused more on macroeconomic aspects, such as public expenditure management, while this analysis focused on the impact of demographic change and migration. The differences were that S. Mirzoev (2022) proposed structural reforms to improve fiscal management, while this analysis focused more on attracting additional sources of financing, such as migrant contributions.

D.S. Zholboldueva *et al.* (2024) analysed the pension system of Kyrgyzstan, in particular the impact of labour migration on its financial stability. Their findings, similar to those of this study, emphasise that high levels of migration lead to insufficient contributions to the pension fund, which weakens the system. The main difference was that D.S. Zholboldueva *et al.* (2024) analysed in detail the three-pillar pension system and funded elements, while the present study focused on social aspects and coverage of informal workers.

The World Bank (2014) analysis of the Kyrgyz pension system highlights several key points that align and contrast with the findings in this study. Both reports identify financial instability within the pension system due to low contributions and high dependency rates, emphasizing that the current pay-as-you-go system cannot be sustained without reform. The World Bank document stresses the rapid aging of the population and the shrinking base of contributors, which leads to an increasing burden on the pension fund, a trend that matches the conclusions of this research. In terms of differences, the World Bank focuses more on fiscal sustainability and suggests reforms such as indexing contributions to wage growth and raising the retirement age. In contrast, this analysis places greater emphasis on the social aspects of pension reform, particularly the need for better coverage of informal sector workers and labour migrants. While both analyses agree on the necessity of reform, the World Bank places more weight on macroeconomic policy adjustments, while this study highlights the importance of social protections and inclusivity in pension reforms.

U.U. Achilov (2023) analysed the pension system of Uzbekistan, proposing a three-pillar model with state, mandatory funded, and private contributions. As in the present study, he emphasized the importance of balancing these approaches for financial stability and the problem of under-contribution due to the high share of informal employment. The main difference was that U.U. Achilov (2023) focused more on the implementation of the three-pillar system, while this study focused on the impact of migration on the sustainability of the pension fund.

S. Salimov (2018) analysed the development of Uzbekistan's pension system through the prism of the experience of the European Union. He emphasized the importance of reforming Uzbekistan's pension system, particularly by introducing additional savings and insurance mechanisms to help ensure the financial stability of the system. Comparing the findings of this study with those of the present study, there were some similarities. Both studies recognized the importance of reforming the pension system, especially in the context of increasing life expectancy and demographic challenges. In addition, both the present study and the paper by S. Salimov (2018) emphasized the need to increase the coverage of the pension system, especially for informal workers. However, there were some differences. S. Salimov (2018) focused more on borrowing from the experience of European countries and introducing funded elements, while this study placed more emphasis on internal

demographic and social aspects, such as the impact of labour migration on the sustainability of pension funds.

Z. Beknazarov & D. Rustamov (2021) analysed pension systems with a focus on a multi-pillar model that combines pay-as-you-go and funded elements. This coincided with the findings of this study, which also emphasized the need for a balance between different approaches for financial sustainability. Both studies recognized the importance of reforms to accommodate the rising retirement age and the need to cover the informal sector. The differences lay in the fact that Z. Beknazarov & D. Rustamov (2021) focused more on international comparisons, while this study focused on specific regional challenges, such as labour migration.

G.A. Junusbekova & M.D. Zhaumitova (2020) analysed Kazakhstan's pension system, emphasising the importance of balancing funded and pay-as-you-go elements for sustainability, which was consistent with the findings of this study. Both studies recognised the demographic challenges and the need for reforms to improve pension financing and coverage of the informal sector. The differences lay in the fact that G.A. Junusbekova & M.D. Zhaumitova (2020) focused more on macroeconomic analysis and modelling, while this study focused on the impact of migration and the social aspects of reforms.

The study by G.G. Urinboev (2023) and the current research have some similarities and differences. Both emphasize the need for pension system reform in Uzbekistan and focus on demographic challenges such as population aging. Both analyses highlight the issue of insufficient contributions and weak regulation, which undermine the financial stability of the system. However, G.G. Urinboev (2023) placed more emphasis on technical aspects, such as the automation of payments, while the current study focuses more on labour migration and its impact on the pension system.

The study by S.A. Shermukhamedova (2023) and the current research share some common points, both emphasizing the need for pension system improvements in Uzbekistan and highlighting financial challenges due to an aging population. S.A. Shermukhamedova (2023) focused more on the rise in pension recipients and the financial management of the Pension Fund, particularly regarding income sources and insurance premium policies. In contrast, the current research emphasizes labour migration and informal employment's impact on pension contributions, which S.A. Shermukhamedova (2023) discusses less. Both agree on the need for financial reforms but differ in their proposed solutions, with the current study focusing more on investment diversification.

The comparison between Central Asia's pension systems and Sweden's, as outlined by the European Union, shows significant differences (Government of Sweden, 2020). Central Asia faces challenges like low coverage, insufficient contributions, and financial instability, particularly among informal workers. In contrast, Sweden has a well-established system with universal coverage and sustainable funding, with mechanisms like income indexation to protect against inflation (Gutium *et al*., 2023). Labour migration weakens pension systems in Central Asia, whereas Sweden manages migration without financial strain. Sweden's adaptable pension model ensures long-term stability, while Central Asia is still working on reforms to address structural issues like informal employment and funding gaps.

The Federal Ministry of Labour and Social Affairs of Germany (2023) emphasizes long-term sustainability and demographic challenges in Germany's pension system, highlighting the need for balanced financing and reforms such as raising the retirement age. This aligns with the data, as both recognize the need for reforms to ensure stability and address aging populations. The key difference is that Germany's system focuses on a well-established three-pillar approach (statutory, occupational, and private), while the Central Asian systems focus more on incorporating informal sector workers and addressing financial instability. Germany's pension reforms are more advanced, while Central Asia is still expanding coverage.

The Ministry of Economy and Finance of France (2023) report on France's pension system highlights the importance of reforms, sustainability, and addressing demographic challenges, much like the findings in this research. Both emphasize the need for raising the retirement age, enhancing fund management, and ensuring sufficient contributions to maintain financial stability, especially in the context of an aging population. However, the differences lie in the complexity and focus of the issues. The French system is more advanced, focusing on supplementary pension schemes and robust fiscal management (Ketners, 2024). In contrast, this research on Central Asia deals with more fundamental challenges such as the inclusion of informal workers, the impact of labour migration on pension contributions, and the broader financial instability of pension funds, which are still in the process of development and reform.

J. Stachura's analysis of Poland's pension system focuses on sustainability amid demographic challenges like aging populations and declining birth rates (Ministry of Finance of Poland, 2023). Both her report and this research emphasize the importance of reforms to maintain financial stability and address dependency ratios. The main difference lies in focus: J. Stachura discusses Poland's mature system, addressing issues like retirement age and contributory periods, while this research highlights the earlier stages of reform in Central Asia, particularly challenges like labour migration, the informal sector, and economic instability.

The comparison of pension systems in Central Asia and Denmark reveals significant differences and some similarities. Both regions recognize the need for effective pension frameworks to ensure financial security for aging populations. Denmark's system, as outlined by the European Union, features a multi-pillar approach, including universal state pensions and mandatory occupational plans, ensuring adequate support for retirees (Ministry of Finance of Denmark, 2023). In contrast, Central Asian countries rely on pay-as-you-go systems, resulting in lower benefits that often fail to meet basic needs. Denmark employs effective investment strategies that enhance pension growth, while

Central Asia struggles with low returns and insufficient regulations, threatening the stability of their pension systems. Additionally, Denmark effectively manages its aging population, while Central Asia faces challenges from both aging and high labour migration, reducing pension contributions. In summary, Denmark's comprehensive and adaptable pension system leads to better financial outcomes for retirees, whereas Central Asia's reliance on pay-as-you-go models highlights the urgent need for reforms. Learning from Denmark's approach, particularly in diversifying pension sources and enhancing regulations, is essential for strengthening Central Asian pension systems.

Comparing the pension systems of Central Asia and Switzerland highlights key similarities and differences. Both regions face challenges from aging populations, with Switzerland's over-65 demographic projected to reach 41.2% by 2030, similar to trends in Central Asia. Both recognize the need for reform to address fiscal pressures related to these demographics. Switzerland's implementation of a 13th pension month, as noted by Fitch Ratings, exemplifies proactive reform, while Central Asian countries aim to enhance pension coverage and contributions from informal workers. However, Switzerland's multi-pillar pension system is backed by a strong economy and low debt levels, whereas Central Asia relies on state-funded models with low contributions. Fitch Ratings indicates that Switzerland's pension reform will not affect its creditworthiness, while Central Asian countries face financial instability and vulnerability to pension spending changes (Switzerland's pension increases…, 2024). According to Fitch Ratings, Switzerland's reform was enacted through a popular initiative, reflecting public engagement, while Central Asian reforms often lack this participation. Ultimately, while both regions share the need for pension reforms, Switzerland's established system stands in stark contrast to the urgent needs of Central Asia's pension systems.

In comparing the results of this study with others, there are notable similarities and differences across various analyses of pension systems. Common themes include the challenges of low returns, inflation, and the importance of pension contributions in maintaining system stability. Several studies emphasize the need for reforms, such as raising the retirement age, improving fund management, and balancing funded and pay-as-you-go components to ensure sustainability. Key differences arise in the approaches to solving these issues. While some analyses focus on adopting multi-pillar pension systems and borrowing from international models, this study emphasizes the specific challenges faced by Central Asia, such as labour migration, informal employment, and broader economic instability. These factors significantly affect pension contributions and system sustainability in the region. Additionally, while more advanced pension systems, such as those in Europe, prioritize fiscal management and supplementary schemes, Central Asian countries are still grappling with fundamental reforms to expand coverage and stabilize pension funds.

Conclusions

Important successes and difficulties are shown by the study of Central Asian pension systems. Financial sustainability is nevertheless threatened by enduring problems like inadequate pension payments, substantial labour migration, and widespread informal employment, notwithstanding measures that have been put in place to address demographic and economic changes. Although Kazakhstan has made significant strides toward creating a funded pension system, ineffective investment management has kept public trust low. This study and others emphasize how crucial it is to diversify pension funds and enhance governance in order to ensure sustainability. Although there is promise in Kazakhstan's use of pension assets for economic development, these investments need to be carefully watched to minimize risks.

Similar issues with limited informal worker contributions exist in Uzbekistan, although attempts to engage migrant workers through international agreements have showed potential. This strategy might lessen the financial gaps brought on by labour migration. The absence of investment opportunities and transparency in Turkmenistan's state-run pension system raises questions about its long-term viability. Informal employment and labour migration are problems for Kyrgyzstan's hybrid system, and digital attempts to integrate migrants into the system have not been very successful. Due to its weak economic foundation and reliance on remittances, Tajikistan's pay-as-you-go system is extremely unstable and urgently needs to be reformed in order to stabilize its pension fund.

Overall, the study concludes that the pension systems in Central Asia have similar difficulties, especially when it comes to obtaining adequate contributions and dealing with migration. The stability of the pension system depends on ongoing reforms in fund administration, investment diversification, and the inclusion of informal workers.

This study has a number of shortcomings, chief among them being the dependability and accessibility of the data, especially from opaque nations like Turkmenistan. It has been challenging to thoroughly evaluate the effects of pension reforms and conduct a thorough comparison of systems throughout Central Asia due to a lack of trustworthy data. Furthermore, some of the tendencies found in this study may change over time due to the dynamic nature of the demographic and economic factors affecting pension systems; however, this was outside the purview of this analysis.

Future studies should focus on enhancing data collection techniques to guarantee more precise evaluations and comparisons throughout Central Asia. Additionally, it's critical to investigate how international collaboration might improve pension system stability, especially in relation to labour migration. Additionally, there are chances to boost financial management throughout the region, boost participation, and enhance transparency through the use of digital technology in pension administration. Pension systems in Central Asia must change in tandem with the region's economies in order to adequately protect the elderly while maintaining their financial viability.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Achilov, U.U. (2023). Prospects for improving the pension system in Uzbekistan. *Western European Journal of Modern Experiments and Scientific Methods*, 1(4), 106-113.
[2] Alishli, A., Alili, A., Teymurova, V., & Huseynov, R. (2024). Labour market regulation of individual countries under an applied interpretation of Keynes and Friedman's theories. *Polish Journal of Management Studies*, 29(1), 24-42. doi: 10.17512/pjms.2024.29.1.02.
[3] Asian Development Bank. (2023). *Reforming Kazakhstan's pension system*. Retrieved from https://www.adb.org/sites/default/files/publication/28591/kaz-proj-brief-pension-system.pdf.
[4] Bekbossinova, A., Kireyeva, A., Kenzhegulova, G., Bekturganova, M., & Imangali, Zh. (2023). The impact of investment and social factors on pension savings in Kazakhstan. *Investment Management and Financial Innovations*, 20(3), 102-115. doi: 10.21511/imfi.20(3).2023.09.
[5] Beknazarov, Z., & Rustamov, D. (2021). A review of existing pension services in developed and developing countries. *E3S Web of Conferences*, 258, article number 05040. doi: 10.1051/e3sconf/202125805040.
[6] Berdiyeva, U.U. (2022). Reform and improve the pension system in Uzbekistan. *World Economics & Finance Bulletin*, 6, 23-28.
[7] Cheberyako, O., & Skulish, Yu. (2022). The level of pension provision of the population is a guarantee of social security of the person. *University Economic Bulletin*, 17(1), 135-146. doi: 10.31470/2306-546X-2022-52-135-146.
[8] Chomik, R., O'Keefe, P., & Piggott, J. (2024). *Pensions in ageing Asia: Policy insights and priorities*. Retrieved from http://surl.li/exeyjc.
[9] Federal Ministry of Labour and Social Affairs of Germany. (2023). *2024 Ageing Report: Germany – Country Fiche*. Retrieved from http://surl.li/olwwmz.
[10] Gazilas, E.T. (2024). Empirical analysis on the impact of labour market regulations on uninsured employment in Greece. *Economics of Development*, 23(1), 8-17. doi: 10.57111/econ/1.2024.08.
[11] Government of Sweden. (2020). *The Swedish pension system and pension projections until 2070*. Retrieved from https://economy-finance.ec.europa.eu/system/files/2021-05/se_-_ar_2021_final_pension_fiche.pdf.
[12] Gutium, T., Gojaeva, E., & Huseynova, S. (2023). Social exclusion and poverty in the European Union and candidate countries. *Cogito*, 15(2), 124-145.
[13] House of Commons Foreign Affairs Committee. (2024). *Countries at crossroads: UK engagement in Central Asia: Government response to the committee's tenth report of session 2022-23*. Retrieved from https://committees.parliament.uk/publications/43019/documents/213977/default/.
[14] Junusbekova, G.A., & Zhaumitova, M.D. (2020). The efficacy of the retirement pension provision system: Modeling, and assessing of the case of Kazakhstan. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), article number 158. doi: 10.3390/joitmc6040158.
[15] Ketners, K. (2024). Developing potential budget reform for Latvia: Shifting from conventional to contemporary budgeting. *Social and Legal Studios*, 7(2), 55-63. doi: 10.32518/sals2.2024.55.
[16] Khamzin, A.Sh., Khamzina, Zh.A., & Buribayev, Y.A. (2015). The decent work programme of Kazakhstan: Social and labor rights protection from an institutional aspect of international law. *Journal of East Asia and International Law*, 8(2), 539-540.
[17] Makhanov, K. (2024). *The elderly in Central Asia*. Retrieved from https://www.hurights.or.jp/archives/focus/section3/2024/06/the-elderly-in-central-asia.html.
[18] Ministry of Economy and Finance of France. (2023). *2024 Ageing Report: France – Country Fiche*. Retrieved from https://economy-finance.ec.europa.eu/document/download/e412927a-ea31-406d-bb6c-c925914123e9_en?filename=2024-ageing-report-country-fiche-France.pdf.
[19] Ministry of Finance of Denmark. (2023). *Denmark Country Fiche – 2024 Ageing Report*. Retrieved from https://economy-finance.ec.europa.eu/document/download/93eeaeab-e2bf-4e62-9cc9-bbb42c2f091e_en?filename=2024-ageing-report-country-fiche-Denmark.pdf.
[20] Ministry of Finance of Poland. (2023). *2024 Ageing Report: Poland – Country Fiche*. Retrieved from https://economy-finance.ec.europa.eu/document/download/568baf8e-3a50-4859-8507-f0d963411213_en?filename=2024-ageing-report-country-fiche-Poland.pdf.
[21] Mirzoev, S. (2022). *Public expenditure and institutional review of the social protection sector in Tajikistan*. Geneva: International Labour Organization.
[22] Organisation for Economic Co-operation and Development. (2015). *Pensions at a Glance 2015: OECD and G20 indicators*. Paris: Organisation for Economic Co-operation and Development Publishing. doi: 10.1787/pension_glance-2015-en.

[23] Palmer, E. (2007). *Pension reform and the development of pension systems: An evaluation of World Bank assistance*. Washington: World Bank.
[24] Park, D., & Estrada, G.B. (2022). Chapter 14. Emerging Asia's public pension systems: Challenges and reform efforts. In B.J. Clements, F. Eich & S. Gupta (Eds.), *Equitable and sustainable pensions* (pp. 273-292). New York: International Monetary Fund.
[25] Salimov, S. (2018). Development of pension system of Uzbekistan through the experience of the countries of the European Union. *International Journal of Social Science and Economics Invention*, 4(5), 1-6. doi: 10.23958/ijsei/vol04-i05/82.
[26] Schiff, J.A., Schimmelpfennig, A., Hobdari, N.A., & Zytek, R. (2001). Introduction of a three-pillar pension system. In J.A. Schiff, A. Schimmelpfennig, N.A. Hobdari & R. Zytek (Eds.), *Pension reform in the Baltics* (pp. 19-27). New York: International Monetary Fund.
[27] Shermukhamedova, S.A. (2023). Analysis of the practice of the pension system in Uzbekistan. *International Journal of Business Diplomacy and Economy*, 2(11), 107-110. doi: 10.51699/ijbde.v2i11.2954.
[28] Switzerland's pension increases to have a modest impact on public finances. (2024). Retrieved from https://www.fitchratings.com/research/sovereigns/switzerlands-pension-increases-to-have-modest-impact-on-public-finances-26-03-2024.
[29] Tolymbek, A. (2022). Comparative standing of Kazakhstan pension system performance: Learning policy lessons from Canadian experience. *Technology Audit and Production Reserves*, 6(68), 34-42. doi: 10.15587/2706-5448.2022.271585.
[30] Urinboev, G.G. (2023). Problems of the pension system of Uzbekistan and ways to solve them. *Academic Journal of Digital Economics and Stability*, 36, 1-9.
[31] World Bank. (2014). *Kyrgyz Republic. Public expenditure review policy notes*. Retrieved from https://documents.worldbank.org/en/publication/documents-reports/documentdetail/887061468089699711/kyrgyz-republic-public-expenditure-review-policy-notes-strategic-setting.
[32] World Bank. (2019). *Early access to pension savings: International experience and lessons learnt*. Washington: The World Bank Group.
[33] World Bank. (2020). *An assessment of the social protection system in Uzbekistan: Based on the Core Diagnostic instrument (CODI)*. Geneva: ILO Publishing.
[34] Zholboldueva, D.S., Murzalieva, E.I., Shtybaeva, O.R., Dolonova, T.A., & Maratovna, U.A. (2024). Formation of the pension system of the Kyrgyz Republic and problems at the present stage of its development. *BIO Web of Conferences*, 83, article number 07004. doi: 10.1051/bioconf/20248307004.

Пенсійні системи Центральної Азії: порівняльний аналіз досягнень, ризиків та механізмів розвитку

Бахтіяр Алієв
Докторант
Киргизький економічний університет імені Муси Рискулбекова
720033, вул. Тоголок Молдо, 58, м. Бішкек, Киргизька Республіка
https://orcid.org/0009-0002-0477-5391
Толобек Камчибеков
Доктор економічних наук, професор
Киргизький економічний університет імені Муси Рискулбекова
720033, вул. Тоголок Молдо, 58, м. Бішкек, Киргизька Республіка
https://orcid.org/0000-0003-2561-3316
Джумабек Джаілов
Доктор економічних наук, професор
Інститут держави і права Національної академії наук Киргизької Республіки
720010, просп. Чуй, 265А, м. Бішкек, Киргизька Республіка
https://orcid.org/0000-0002-0840-3440
Шаннінг Фу
Докторант
Киргизький національний університет імені Жусупа Баласаґина
720033, вул. Фрунзе, 547, м. Бішкек, Киргизька Республіка
https://orcid.org/0009-0007-3280-7991

Анотація. Метою цього дослідження був аналіз пенсійних систем країн Центральної Азії для оцінки ефективності пенсійних реформ та визначення ключових викликів, що впливають на їхню фінансову стійкість. Дослідження зосереджувалось на впливі трудової міграції, неформальної зайнятості та демографічних змін на пенсійні системи цих країн. Було проведено порівняльний аналіз для оцінки пенсійних систем на основі таких ключових показників, як внески до пенсійного фонду, демографічні тенденції та структура пенсійних моделей – солідарної, накопичувальної чи змішаної. Результати дослідження свідчили про значні відмінності між пенсійними системами країн Центральної Азії. Казахстан запровадив накопичувальну пенсійну систему, але стикається з проблемами через низьку прибутковість інвестицій та недовіру населення. Узбекистан, незважаючи на зусилля з інтеграції трудових мігрантів у пенсійну систему, все ще бореться з недостатніми внесками з неформального сектору. Туркменістан зберігає державну пенсійну систему, але брак прозорості обмежує можливість оцінити її довгострокову життєздатність. Киргизстан запровадив змішану пенсійну систему, але трудова міграція та неформальна економіка підривають її ефективність. Таджикистан продовжує покладатися на традиційну солідарну модель, але економічна нестабільність і міграція створюють серйозні фінансові проблеми. Таким чином, пенсійні системи в Центральній Азії мають спільні проблеми, особливо в управлінні трудовою міграцією та охопленні неформальних працівників. Для забезпечення стійкості пенсійних фондів необхідні постійні реформи, спрямовані на поліпшення фінансового управління, диверсифікацію інвестицій і розширення охоплення

Ключові слова: демографічні виклики; пенсійні виплати; соціальне забезпечення; фінансова стійкість; соціальна держава

Scientific Bulletin
of Mukachevo State University
Series
Economics

Volume 11, No. 4, 106-119
Journal homepage: https://economics-msu.com.ua/en

UDC 339.97
DOI: 10.52566/msu-econ4.2024.106

Adaptation of the economic policies of the US, EU and post-Soviet countries to new realities of the global economy: A comparative analysis

Avtandil Silagadze*

Doctor of Economics, Professor
Tbilisi State University
0179, 1 Ilia Tchavtchavadze Ave., Tbilisi, Georgia
https://orcid.org/0000-0001-7782-9827

Elguja Mekvabishvili

Doctor of Economics, Professor
Tbilisi State University
0179, 1 Ilia Tchavtchavadze Ave., Tbilisi, Georgia
https://orcid.org/0009-0001-9675-4012

Giorgi Gaganidze

PhD in Economics
Tbilisi State University
0179, 1 Ilia Tchavtchavadze Ave., Tbilisi, Georgia
https://orcid.org/0000-0002-6530-1600

Tamar Atanelishvili

Doctor of Economics, Professor
Tbilisi State University
0179, 1 Ilia Tchavtchavadze Ave., Tbilisi, Georgia
https://orcid.org/0000-0003-2567-0337

Mikheil Chikviladze

Professor
Tbilisi State University
0179, 1 Ilia Tchavtchavadze Ave., Tbilisi, Georgia
https://orcid.org/0009-0009-0683-6806

Received: 30.07.2024, Revised: 25.10.2024, Accepted: 27.12.2024

Suggested Citation: Silagadze, A., Mekvabishvili, E., Gaganidze, G., Atanelishvili, T., & Chikviladze, M. (2024). Adaptation of the economic policies of the US, EU and post-Soviet countries to new realities of the global economy: A comparative analysis. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 106-119. doi: 10.52566/msu-econ4.2024.106.

*Corresponding author

Abstract. The study aimed to address the impact of global economic changes on national economic strategies and to address the peculiarities of adapting countries' economic policies to the new conditions. The study analysed modern approaches to adapting economic policy in the context of globalisation, digitalisation and environmental challenges. The strategic directions of economic policy addressed integration into global economic processes, digital transformation, sustainable development, economic diversification and social orientation were assessed. The first aspect was global integration, which involved opening markets, developing international cooperation and actively participating in global production chains. The second important area was adaptation to digital changes, which included the introduction of the latest technologies, such as artificial intelligence, blockchain, and big data analytics. In addition, the importance of sustainable development as a basis for ensuring environmental safety and economic growth was emphasised. Analysis of the experience of the United States, the EU and post-Soviet countries determined that economic policy should prioritise innovation, energy efficiency and digital transformation. The US is characterised by support for innovative start-ups, the development of digital technologies and energy transformation through programmes. The EU is actively investing in renewable energy and digital transformation, implementing green economy strategies. Post-Soviet countries, including Ukraine, Georgia and Moldova, face challenges related to reforms, limited resources and integration into the EU. However, these countries are already making progress in energy transformation, digital development and regional cooperation. To ensure sustainable economic development, countries must flexibly adapt their policies to global challenges, intensify digital transformation and energy transformation, and invest in innovation and regional cooperation

Keywords: energy security; digitalisation; environmental issues; COVID-19; market regulation

Introduction

The research relevance is determined by the need for a deeper understanding of economic policy in the context of global economic instability. Events such as the COVID-19 pandemic, the war in Ukraine, the energy crisis, and the redistribution of spheres of influence in the global market have exposed the vulnerability of traditional approaches to economic governance. At the same time, interregional cooperation and the introduction of innovative solutions to overcome common challenges are becoming increasingly important.

In the context of globalisation, digitalisation and escalating geopolitical challenges, the economic policies of many countries are undergoing significant transformations. The United States, the EU and the post-Soviet states, with different levels of economic development, historical backgrounds and political interests, face similar challenges in formulating and implementing their economic strategies. These challenges include adapting to new economic realities, including global supply chains, the growing role of technology, energy crises, climate change and geopolitical threats.

The challenge of adapting economic policy is determined by the need to find a balance between national interests and to integrate into global economic processes. For the United States, the key task is to maintain its position on the world stage through innovation, technological development and countering economic threats from other powerful players such as China (Reznikova *et al.*, 2022). The EU, in turn, may focus on ensuring energy security, climate change resilience, and the development of a green economy. Post-Soviet countries may face the challenges of structural reforms, dependence on commodity-based economies, and the need to integrate into global markets.

The theoretical foundations of this topic are based on the concepts of economic development, globalisation and regional economic integration. The models of economic adaptation of the US, EU and post-Soviet countries identified both general trends and specific differences due to historical, political and economic contexts. These approaches are necessary for developing recommendations to improve the effectiveness of national economic strategies in a changing world.

In analysing adaptation strategies in the global economy, researchers analysed various aspects of this issue in detail. A. Agrawal *et al.* (2019) examined the impact of technological innovations on US economic policy, emphasising that the integration of artificial intelligence and automation has increased productivity, but at the same time exacerbated employment issues. Similar conclusions were drawn by I. Ulnicane *et al.* (2021) regarding the need for government regulation in the field of new technologies to avoid social inequality. M.D. Pérez *et al.* (2019) emphasised the importance of energy security as a key aspect of the EU's economic strategy. The authors noted that investments in renewable energy allowed the EU to reduce dependence on energy imports, but new challenges related to financing and technological barriers were emerging. This approach to energy transformation was supported by P.M. Falcone (2020), who emphasised the role of green finance in creating a sustainable economy. In the context of post-Soviet countries, N. Robinson (2019) studied the consequences of raw material dependence on economic policy, showing that an excessive focus on natural resource exports led to limited economic growth. At the same time, the author proposed to focus on economic diversification as a strategic goal. O. Gurshev (2023) complemented this topic by analysing the role of foreign investment in the modernisation of the economies of post-Soviet countries, pointing to the need to create a favourable investment climate. T. Notteboom *et al.* (2021) compared the adaptation mechanisms of the US and the EU, concluding that the integration of innovative technologies in the US is faster due to less bureaucracy. At the same time, the EU, according to

the authors, demonstrates a more systematic approach to social protection in the face of change. Similar aspects were discussed by S. Wolff & S. Ladi (2020), who focused on different approaches to climate policy, noting that the EU's long-term orientation could serve as an example for other regions. An in-depth analysis of global changes was also offered by J. Janczak (2019). The study highlighted the role of interregional cooperation in overcoming economic crises, noting the positive results of the US-EU partnership in the field of innovation. C. Morrison & U. Rossi (2022) studied the consequences of geopolitical conflicts on the economic policy of post-Soviet countries, emphasising their need to reduce dependence on monopolistic external partners.

In general, these works lay the groundwork for the study, demonstrating the diversity of approaches to adapting economic policy in the face of global challenges and allowing their integration into comparative analysis. However, there is a lack of a comprehensive analysis of the transformation of economic models in post-Soviet countries in the context of digitalisation, which is a key factor in the modern global economy (Zubiashvili *et al*., 2023). In addition, the comparison of the effectiveness of the US and EU integration efforts in the field of sustainable development and environmental policy is not fully disclosed, which could provide valuable experience for other regions.

The study aimed to provide a comprehensive comparative analysis of the economic policies of the USA, the EU and post-Soviet countries, in the context of their adaptation to the challenges of globalisation, digitalisation and environmental change, to identify potential areas for improving strategies in each region. The objectives of the study were to analyse key trends in the economic policies of the US, EU and post-Soviet countries in the context of global economic changes; to assess the effectiveness of each region's adaptation mechanisms, covering specific challenges; to identify common and distinctive elements in the economic strategies of the regions and to formulate recommendations for their improvement.

Materials and Methods

The study of economic policy adaptation to global challenges uses a comprehensive approach that includes an analysis of theoretical concepts, a comparison of the experiences of different countries, and the use of quantitative and qualitative methods for assessing economic processes. In particular, integration into global economic processes, digital transformation, environmental challenges, as well as economic policy adaptation in the US, the EU (Germany, France, the UK, Italy, Switzerland) and post-Soviet countries such as Georgia, Ukraine, Azerbaijan, Moldova and Armenia were highlighted.

The main material for the study was statistical data and reports from international organisations such as the World Intellectual Property Organisation (2024) and the International Renewable Energy Agency (2024). To analyse the state of digitalisation, innovation and sustainable development, the Global Innovation Index for 2024 was used to compare the level of development of innovative technologies among countries around the world. This was used to assess the place of different countries, including post-Soviet ones, in the global context of technological development and economic adaptation.

For a deeper analysis of digital transformations in the economy, information on investments in new technologies, the development of start-ups, e-commerce and infrastructure in the US, EU and post-Soviet countries was also used (United Nations Conference on Trade and Development, 2024). The study of digital transformation was based on a comparison of the policies of the United States and the EU, which have a high level of development in the field of innovation, with the post-Soviet countries, where these processes are still in their early stages.

To analyse the environmental aspects of the study, data on investments in renewable energy sources and measures to reduce greenhouse gas emissions were used. In particular, the European Green Deal (2019) programmes and US energy transformation policies, such as the Inflation Reduction Act (2022) and renewable energy initiatives in individual states, such as Texas and California (CPUC expands existing…, 2024), were analysed. The US study considered the CHIPS and Science Act (2022), the Paycheck Protection Programme (2021) and the Infrastructure Investment and Jobs Act (2021). Within the EU, REPowerEU (2022), Horizon Europe, NextGenerationEU, Carbon Border Adjustment Mechanism (2024) and Digital Services Act (2024) were considered. Particular attention is paid to comparing approaches to energy transformation in the post-Soviet countries, in Ukraine, Azerbaijan and Moldova, to identify possible ways to optimise their economic policies concerning environmental challenges.

The research methodology included a comparative analysis of the above-mentioned strategies, policies and regulations of different countries, including the US, EU and post-Soviet countries, as well as an assessment of the effectiveness of economic reforms. For this purpose, both qualitative methods, such as analysis of the above-mentioned acts and economic development strategies, and quantitative methods, including statistics and indices reflecting the level of innovation, digital transformation and environmental transformation, were used. These methods were used to assess the effectiveness of various economic policy adaptation strategies and identify key factors that influence the success of adaptation to global challenges.

Results

Theoretical foundations of economic policy adaptation

Economic policy adaptation is an important component in the context of global change, and studying this process determines how countries and regions respond to the challenges of the modern economy. Due to the acceleration of globalisation, digitalisation and market transformation, conceptual approaches to economic policy adaptation are changing, reflecting new economic realities and the need for prompt response. Identification of these approaches can

be used to formulate strategies that not only solve current problems but also contribute to sustainable development in the long run (Abbass *et al*., 2022). First, the adaptation of economic policy is often viewed in the context of a global integration strategy. In this context, countries, regardless of their level of development, are forced to integrate into international economic processes in the face of global challenges such as climate change, technological revolutions, and changes in the international trade system. The strategy of global integration involves opening markets, developing international cooperation, and actively participating in global supply chains (Van Tran *et al*., 2019). For instance, in the United States and the EU, integration into the global economy has become the basis for innovation, competitiveness and technology development.

The second conceptual approach is to adapt economic policy to digital change. In the context of digital transformation, countries must ensure rapid adaptation to new technologies, such as artificial intelligence, big data, blockchain, and other innovations. This approach involves not only the introduction of the latest technologies into production processes but also the transition to a knowledge- and innovation-based economy (Radaelli, 2023). The United States has become a leader in implementing this strategy, where support for start-ups, investments in science and technology, and the creation of a favourable climate for innovative businesses have become the main priorities of economic policy. The concept of sustainable development, which is also a crucial component of economic policy adaptation, is of relevance. It envisages an economic transformation that focuses on the balance between economic growth, social justice and environmental sustainability. This concept is important in the context of climate change and the need to reduce the environmental impact of economic activity (Mensah, 2019). In the EU, the Green Deal concept has become the main development strategy aimed at reducing greenhouse gas emissions, switching to renewable energy sources and supporting sustainable economic growth.

In addition, an important conceptual approach is the strategy of economic diversification. It is especially relevant for countries with a high dependence on a single sector of the economy, such as raw materials. For the post-Soviet countries, including Georgia, Armenia, Azerbaijan, Ukraine and Moldova, diversification is critical to ensuring stable development in the face of the global economic crisis. The introduction of structural reforms, stimulation of small and medium-sized businesses (SMEs), and development of high-tech sectors are all part of this approach. Equally important is the conceptual approach based on socially oriented policy. It aims to ensure social justice and equal opportunities for all citizens, by supporting the unemployed, developing education, healthcare and improving living conditions. In the context of economic turbulence, this approach becomes the basis for minimising social risks and ensuring stability within the country.

One of the latest approaches is the strategy of sustainable economic integration at the regional level. Countries at the crossroads of global economic processes, such as post-Soviet states, should actively explore opportunities for regional cooperation. Such initiatives may include the creation of new trade agreements, economic zones or joint infrastructure projects. This not only ensures economic development in the short term but also strengthens positions in global markets (D'amato & Korhonen, 2021). Thus, economic policy adaptation is a complex, multifaceted process that requires a comprehensive approach and consideration of numerous factors, such as global challenges, digital transformation, environmental change, and social justice. The choice of strategy depends on specific conditions, but each country should be ready for flexible adaptation and be able to respond to the challenges of the modern global economy.

Impact of major trends on the global economy

The modern global economy is influenced by three key trends: globalisation, digitalisation and environmental challenges. Each of them creates new realities, forcing states to rethink their economic strategies, adapt governance mechanisms and find a balance between local needs and global trends.

Globalisation has increased the interdependence of the economies of the world, facilitated access to international markets and created new opportunities for trade, investment and innovation. At the same time, it has exposed weaknesses, including dependence on global supply chains. Events such as the COVID-19 pandemic and geopolitical conflicts have shown that disruption of these chains can have a devastating impact on national economies (Silagadze, 2022). For the United States, globalisation has been an incentive to strengthen its technological leadership and promote its interests through institutions such as the World Trade Organisation. However, it has also raised questions about maintaining competitiveness in the face of the growing role of China and other rapidly developing markets. In response, the US has opted for a policy of restructuring production and supporting the domestic market through initiatives such as reshoring. In the EU, globalisation has stimulated integration processes that have created a single market and increased economic resilience. However, uneven economic development among EU member states remains a challenge, especially in the face of competition with global players. For the post-Soviet countries, globalisation has provided access to new markets and technologies but has also increased their dependence on imports and exports of raw materials. For instance, Azerbaijan is dependent on oil revenues, making its economy vulnerable to global price fluctuations. Georgia and Moldova, by contrast, are trying to integrate into the European market, although they face difficulties in modernising their economies and managing their resources.

Digitalisation has become one of the key factors shaping modern economic policy. It creates opportunities for innovation, business efficiency, and new jobs. At the same time, digitalisation requires governments to invest heavily in digital infrastructure, education, and cybersecurity

(Yuan *et al*., 2021). The United States is a leader in the implementation of digital technologies. The policy of supporting start-ups, and significant investments in research and development of technology parks contributed to the creation of such giants as Apple, Google and Microsoft. This has provided a significant competitive advantage in the global market but has also brought new challenges, such as monopoly regulation and personal data protection. In the EU, digitalisation has become part of the strategic course to build a digital single market. European countries are actively investing in the development of digital skills, business modernisation and technological independence (Sanchez-Montanes *et al*., 2023). At the same time, the regulation of digital platforms, such as the General Data Protection Regulation, is an example of the desire to protect the rights of citizens and create a fair environment for business. For post-Soviet countries, digitalisation is both a challenge and an opportunity. Ukraine, for example, is actively developing its IT sector, turning it into one of its key export sectors. However, in countries such as Armenia and Moldova, digitalisation is hampered by insufficient funding and low levels of digital literacy. To measure digitalisation, the Global Innovation Index is widely used, which reflects the degree of innovation, including digitalisation, infrastructure, institutional support, and the business environment. Table 1 shows the Global Innovation Index results for 2024 for key players in the global economy and post-Soviet countries.

Table 1. Global Innovation Index for 2024

Country/Region	Index	Position in the ranking	Key components of digitalisation
USA	62.4	3	Digital technologies in business, internet coverage, development of the IT sector, access to digital services
Switzerland	67.5	1	Single digital market, investment in IT infrastructure, start-up development, and digital governance
Great Britain	61	5	
Germany	58.1	9	
France	55.7	12	
Italy	45.3	26	
Georgia	30.4	57	Modernising public services, increasing access to the Internet, and developing the digital economy
Ukraine	29.5	60	IT sector development, transformation of public services, poor coverage in rural areas
Armenia	29	63	Development of the IT sector, availability of digital technologies, poor internet access in rural areas
Moldova	28.7	68	Infrastructure upgrades, access to digital services, limited development of technology start-ups
Azerbaijan	21.3	95	Development of digital payment systems, internet access, governments support start-ups and digital innovation

Source: compiled by the authors based on World Intellectual Property Organisation (2024)

Countries that hold leading positions, such as the United States and the EU members, are actively investing in the development of innovation infrastructure and digitalisation. They developed a start-up support system, high availability of digital services, and a substantial IT sector (Bauer & Pandya, 2024). In contrast, post-Soviet countries such as Georgia, Ukraine, Armenia, and Azerbaijan show lower scores, due to problems such as weak infrastructure, limited access to the Internet, and insufficient investment support. However, the gradual progress in the modernisation of public services and attempts to diversify the economy through digitalisation is positive (Nosova *et al*., 2020).

Environmental issues, such as climate change, pollution and depletion of natural resources, significantly affect economic policymaking. Countries are forced to introduce green technologies, optimise energy consumption and develop strategies for the transition to a carbon-neutral economy (Murphy & Gouldson, 2020). In the EU, environmental challenges have become the basis for the implementation of the Green Deal, a large-scale strategy aimed at transitioning to sustainable economic development. This policy includes the development of renewable energy sources, stimulating innovation in environmental technologies, and combating climate change. The United States, although lagging the EU in terms of systematic environmental policy, also focuses on reducing emissions and developing clean energy. Financing programmes for green technologies and support for private initiatives contribute to job creation and economic growth, although political polarisation in the country often makes it difficult to implement these measures. For post-Soviet countries, environmental policy is less of a priority due to economic and social challenges. Azerbaijan, for example, is heavily dependent on fossil fuels, which makes it difficult to transition to sustainable energy. In contrast, Georgia and Moldova are gradually developing renewable energy, although they face financing constraints. Figure 1 shows investments in renewable energy.

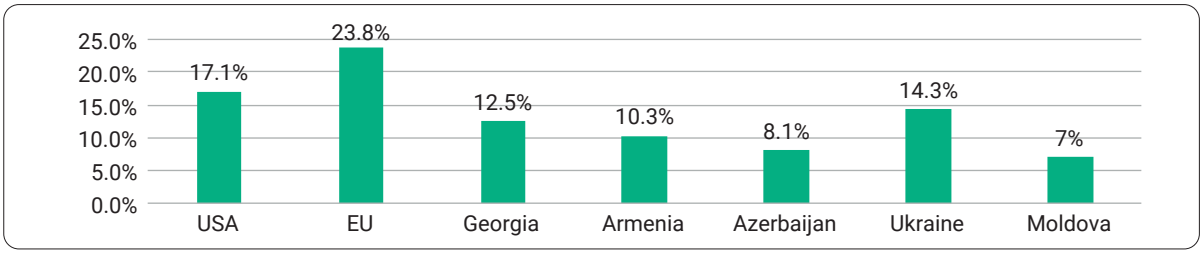

Figure 1. Investments in renewable energy as a % of total energy consumption, 2023
Source: compiled by the authors based on International Renewable Energy Agency (2024)

The Figure 1 shows a significant difference in approaches to energy transformation. The US and the EU allocate a much higher share of investments to renewable energy sources, which correlates with the ambitions to reduce CO_2 emissions and transition to green technologies. In post-Soviet countries such as Azerbaijan and Moldova, investments are much lower but still indicate a move towards energy diversification. Ukraine and Georgia have a significant share respectively, reflecting their gradual transition to green energy amid the need to reduce dependence on external energy sources and adapt to European standards.

Economic policies of the US, EU and post-Soviet countries

US economic policy demonstrates the ability to adapt effectively to global and domestic challenges. Flexible responses to changes in technology, energy and international trade ensure that the US remains one of the world's most powerful economies, applying innovative approaches to overcome current challenges. One of the main challenges for the United States is the growing international competition, especially from China, which is actively investing in innovation and infrastructure. For instance, China has become a leading semiconductor producer, which led the US to develop and pass the CHIPS and Science Act (2022). This law provides USD 52 billion for the development of microchip production domestically to reduce dependence on Asian suppliers and strengthen national security. Another challenge is the fight against climate change. The US signing of the Inflation Reduction Act (2022) in 2022 was an important step in this direction. The law provides for investments of USD 369 billion to support renewable energy, electric vehicles and green energy innovations. This document aims to achieve carbon neutrality in the US by 2050. Socioeconomic inequality remains a significant problem. The US government has taken steps to address it by adopting economic assistance packages in the context of the COVID-19 pandemic, including the Paycheck Protection Programme (2021), which has provided support to more than 5 million small businesses. The priorities of the US economic policy are to invest in innovation, support domestic production, stimulate infrastructure development, and reduce dependence on imports in strategic sectors.

The United States remains a leader in the development of innovative technologies, thanks to significant investments in areas such as artificial intelligence, quantum computing and biotechnology. For instance, Tesla, a pioneer in the production of electric vehicles, has received significant support through government subsidies and tax breaks for the development of green energy. Energy transformation is also a major direction. For instance, Texas, one of the largest oil producers, has been actively implementing renewable energy. As of 2023, Texas is the leader in wind energy production, providing more than 20% of the state's energy. The United States also actively cooperates with partners in the energy sector. During the energy crisis in Europe caused by the Russian invasion of Ukraine, the United States became the main supplier of liquefied natural gas to the EU, reducing Europe's dependence on Russian energy resources. In the energy sector, one of the biggest achievements was the launch of a solar energy development programme in California. Thanks to the support of government grants and tax incentives, California has become a leader in the implementation of solar power plants. By 2023, more than 40% of the state's energy consumption will be provided by renewable sources (CPUC expands existing…, 2024). Another successful example is investment in infrastructure. The transport system modernisation programme approved through the Infrastructure Investment and Jobs Act (2021) provides USD 1.2 trillion to improve roads, bridges, public transport and water supply. This will not only help create millions of jobs but also ensure long-term economic sustainability.

The EU is facing unprecedented challenges that require rapid adaptation of economic policy. Climate change, the energy crisis, global competition and digital transformation have become key areas shaping EU development strategies (Ciuła *et al.*, 2024). Through a combination of innovations, legislative reforms and partnerships between member states, the EU aims to achieve sustainable economic growth and social equality. One of the main challenges for the EU is to fight climate change and achieve carbon neutrality by 2050. The European Commission has developed the European Green Deal (2019) strategy, which aims to reduce greenhouse gas emissions by 55% by 2030 compared to 1990 levels. To achieve this goal, large-scale investments in energy transformation, transport and industry are envisaged. The energy crisis caused by the reduction of energy supplies from Russia due to its aggression against Ukraine has become a serious challenge. To reduce its dependence on Russian gas, the EU has developed the REPowerEU (2022) plan, which envisages increasing the

supply of liquefied natural gas from the US and other countries, as well as developing renewable energy.

The development of innovative technologies is fundamental to the EU's competitiveness. Through the Horizon Europe programme, 95.5 billion EUR was allocated for research and innovation for the period 2021-2027. For instance, a significant portion of the funds is allocated to research in the field of green energy, including the development of hydrogen technologies. Energy transformation is a key area of economic policy. Germany, France and Spain are actively developing wind and solar energy. Regional cooperation remains an important tool for EU development. As part of the NextGenerationEU pandemic recovery plan, member states received 750 billion EUR to modernise their economies and infrastructure. For instance, Italy received 191.5 EUR billion to develop renewable energy, digitalisation, and increase economic productivity.

In the energy sector, a successful example is the development of a system of joint gas purchases. In 2023, the EU launched a platform for coordinating energy purchases, which allowed member states to avoid excessive competition with each other and reduce prices. Another important achievement is the introduction of the Carbon Border Adjustment Mechanism (2024), which came into effect in 2023. This mechanism eliminates carbon emissions by imposing additional fees on imports from countries with low environmental standards, encouraging domestic producers to comply with environmental standards. In the area of digitalisation, the introduction of a single market for digital services, which strengthens the regulation of Internet companies and provides a safer environment for consumers and businesses, has been a success (Digital Services Act, 2024). Also worth noting is the example of Lithuania, which, thanks to investments in renewable energy, achieved full energy independence from Russia in 2023. This experience has become a model for other member states seeking to achieve energy security.

The post-Soviet countries of Georgia, Armenia, Azerbaijan, Ukraine and Moldova face challenges in the context of global change. Their economic policies are shaped by the legacy of planned economies, geopolitical instability, limited resources and integration processes with the EU. Their success in adapting depends on their ability to implement reforms, attract investment and modernise their economies. For the post-Soviet countries, the key challenge remains the need to reform their economies to strengthen their resilience to external shocks. For instance, in Georgia and Moldova, dependence on the agricultural sector and foreign trade with Russia creates vulnerability to geopolitical and economic crises. In Ukraine, the main challenge is the war with Russia, which has affected all aspects of the economy, including the destruction of infrastructure, reduced industrial capacity, and increased dependence on international financial assistance (Kim *et al.*, 2025). The priorities are to rebuild the destroyed facilities, ensure energy sustainability and integrate with the EU. As a major energy exporter, Azerbaijan faces the challenge of diversifying its economy to reduce its dependence on oil and gas (Musayeva *et al.*, 2024). Energy transformation and attracting investment in non-resource sectors are strategic priorities for the country. Located in a region of high geopolitical tension, Armenia needs to develop its economy sustainably through investments in technology, tourism and manufacturing.

The introduction of innovative technologies is an important area for post-Soviet countries. For instance, Ukraine has become known for the development of its IT sector: in 2022, exports of IT services brought in more than USD 7 billion. This indicates a significant potential for digitalisation of the economy even in times of war (Kazancı & Arslan, 2024). Energy transformation is gaining momentum. Azerbaijan is actively developing its renewable energy sector, including wind and solar power projects, to increase the share of green energy. Moldova, which was dependent on Russian gas, launched joint energy projects with Romania in 2023, reducing energy dependence and increasing energy security. Regional cooperation plays an important role. For example, Georgia, Ukraine, and Moldova signed an agreement to create an "Associated Trio" that promotes joint promotion of European integration aspirations. Armenia, meanwhile, is seeking a balance between cooperation with the EU and participation in the Eurasian Economic Union.

Ukraine has demonstrated successful adaptation in creating alternative energy routes. For instance, after the loss of some traditional energy sources, new power lines were built between Ukraine and EU countries, allowing the power system to be integrated into the European ENTSO-E network in 2022. Azerbaijan has successfully implemented the Southern Gas Corridor project, which has allowed it to supply gas to Europe, reducing the EU's dependence on Russian energy resources. This project also strengthened Azerbaijan's strategic role in the global energy market. Georgia has become a prime example of successful economic liberalisation following reforms. One of the main strategies was a radical reduction of bureaucratic barriers, which included simplifying administrative procedures and reducing the number of permits and licences required to do business. In addition, taxes were reduced, which stimulated entrepreneurship and attracted foreign investment (Kharaishvili & Atanelishvili, 2022). In 2023, Georgia entered the top ten countries in the Ease of Doing Business ranking (World Bank, 2024). Moldova, thanks to cooperation with the EU, has gained access to funding to restore its agricultural sector. Investments in agricultural modernisation have boosted productivity and increased exports to the EU. Armenia has succeeded in developing tourism.

Comparative analysis of economic strategies of countries and improvement of economic policy

Adaptation of economic policy to modern challenges is essential to ensure sustainable development in the context of globalisation, digitalisation and environmental change. Table 2 shows the main challenges and priorities of economic policy in the US, EU and post-Soviet countries.

Table 2. Main challenges and priorities of economic policy of the USA, EU and post-Soviet countries

Country	Key challenges	Economic policy priorities
USA	Climate change, digitalisation, economic inequality	Achievement of zero carbon emissions by 2050, development of green energy, reduction of CO_2 emissions. Transition to renewable energy sources, reducing dependence on fossil fuels
EU	Climate change, energy crisis, digitalisation	Transition to sustainable development, development of policies to reduce emissions and develop renewable energy. Creation of a single digital market, support for start-ups, development of blockchain technologies and the Internet of Things. Reduction of dependence on Russian energy resources, developing alternative energy sources and interconnectors with other countries
Georgia	Geopolitical risks, energy dependence, economic modernisation	Simplifying the business climate, fighting corruption, and supporting foreign investment. Construction of new transport and energy networks, improvement of energy efficiency. Active participation in initiatives with the EU, and expansion of economic ties with Turkey and other neighbouring countries
Armenia	Geopolitical conflicts, economic dependence on imports, low level of infrastructure development	Reducing dependence on Russia and developing other sectors of the economy, such as tourism, IT and manufacturing. Increase tourist flows through cultural potential and improved infrastructure. Investments in technology, start-ups and the creation of digital platforms
Azerbaijan	Dependence on oil and gas, energy transformation, preserving political stability	Development of agriculture, tourism, IT and innovative technologies. Development of solar energy, investments in green projects and energy-saving technologies. Developing the Southern Gas Corridor and increasing gas supplies to Europe
Ukraine	War, destruction of infrastructure, economic depression, foreign economic dependence	Post-war reconstruction, restructuring of enterprises, and restoration of infrastructure. Development of renewable energy sources, and integration of energy systems with the EU. Development of the IT sector, attracting investment in start-ups and innovative technologies
Moldova	Foreign economic dependence, low level of development	Introducing new technologies, increasing export potential to the EU. Improving transport and energy networks, particularly in rural areas. Increasing economic integration with the EU, attracting investment in important sectors of the economy

Source: compiled by the authors

Considering the experience of the United States, the EU, and post-Soviet countries, it is possible to identify key areas for improving economic policy that will be relevant for countries with different levels of economic development. Deepening the digitalisation of the economy is one of the main prerequisites for competitiveness. Countries should actively invest in building digital infrastructure, access to high-speed internet, and automation of government and business processes. For instance, the US experience shows that digital platforms in public administration significantly increase the efficiency of service delivery to citizens. For post-Soviet countries such as Ukraine and Georgia, the introduction of digital solutions in the public sector (e.g., e-government) will help reduce bureaucracy and increase transparency.

Innovative support for SMEs is critical for sustainable economic development. Governments should create start-up funding programmes, reduce the tax burden on innovative companies and stimulate research and development. The EU has demonstrated successful experience in creating ecosystems for start-ups through Horizon Europe programmes that support innovation in green energy and digital technologies. In the context of climate change, governments should create incentives for the development of renewable energy sources, reduction of CO_2 emissions, and implementation of energy-efficient technologies. Countries such as Switzerland are already using tax mechanisms to support environmental initiatives (Hintermann & Zarkovic, 2020). Post-Soviet countries can adopt these approaches by implementing energy efficiency programmes that will reduce dependence on energy imports.

Governments should strive to create fair tax systems that minimise the gap between rich and poor and introduce social programmes for the most vulnerable. An important example is the Scandinavian countries, which have succeeded in this by redistributing income through the tax system. Regional cooperation is an important element of economic policy adaptation. For post-Soviet countries such as Ukraine, Georgia and Moldova, integration into European markets through deeper trade ties and cooperation in energy and innovation will attract foreign investment and improve the quality of economic governance. Improving economic policy requires a systemic approach, where digitalisation, greening, support for innovation, social equality and regional integration are mutually reinforcing. Only a harmonious combination of these elements can ensure stable and sustainable development in today's environment.

Discussion

The results of the study confirm that the economic policies of different countries vary significantly depending on their level of development, strategic priorities and geopolitical context. The analysis shows that globalisation has become a driving force for economic development but has also created new vulnerabilities. For instance, the US emphasis on protecting the national economy by localising the production of technologies such as semiconductors demonstrates a shift from the idea of global integration to the priority

of strategic autonomy. This contrasts with the European approach to regional integration and confirms the trends identified in previous studies. However, these differences also highlight the complexity of post-Soviet countries: they are forced to manoeuvre between globalisation and regional integration processes, while also facing internal economic instability. For instance, the results show that Ukraine and Georgia are seeking EU integration but face economic structural problems. H. Zameer *et al.* (2020) studied the impact of globalisation on innovation development in different countries. The authors concluded that in post-Soviet countries, innovation development is hampered by the low level of integration into international value chains, while in the EU, globalisation stimulates innovation through technology transfer and joint ventures. In the current study, integration into the global economy is also recognised as important, but the emphasis is more on domestic reforms.

One of the key points of the study is to emphasise how digitalisation has become a determining factor in the competitiveness of countries. The data confirms that the US is leading the way in technological development, while the EU is demonstrating a more balanced approach between innovation and regulatory policy. Post-Soviet countries such as Ukraine are showing significant progress in the development of the IT industry, but other countries in the region (e.g., Armenia or Moldova) remain less competitive due to a lack of resources and institutional support (Leshchenko, 2023). This shows that digital transformation creates both opportunities and new gaps between countries. M. Matthess & S. Kunkel (2020) focused on the impact of digitalisation on economic productivity in developing countries. The findings demonstrate that investments in digital infrastructure provide a short-term boost to productivity. However, the long-term sustainability of this impact depends on the level of digital literacy of the population and the development of educational programmes in the field of technology. A.A. Oloyede *et al.* (2023), in turn, argued that in countries with low levels of education or digital literacy, the potential for digitalisation remains limited, despite significant financial injections into technological infrastructure. The findings of the current study also emphasise the importance of digital technologies, but the authors' approach emphasises the need for accompanying measures, such as human capital development. The current study is more optimistic about digitalisation as an engine of growth, while the authors emphasise structural challenges.

Environmental policy is another key area that confirms the differences between the economies. The results show that the EU is a leader in this area with a clear strategy for the European Green Deal, while the US adopted a flexible approach through programmes to stimulate investment in renewable energy. Post-Soviet countries, despite their potential for green energy development, are mostly focused on short-term economic goals. The results confirm the difficulty of integrating environmental aspects into the policies of countries at different stages of development. For instance, in the case of Ukraine, it is a matter of gradual introduction of environmental standards as part of adaptation to European legislation (Parkhomets *et al.*, 2023). M.A. Camilleri (2020) analysed environmental policy in the EU countries. The author noted that in the EU, environmental transformation is a priority, supported by significant funding and political will, while in post-Soviet countries, environmental initiatives are often ignored due to socio-economic crises. R.A. Huber *et al.* (2020) argued that investments in environmental transformation are considered risky due to low levels of trust in government structures and weak political will. International grants or funding are needed to ensure environmental modernisation, which would reduce the burden on state budgets. The current study sees environmental transformation as an opportunity to attract investment, but the authors' findings highlight the difficulties of implementing such changes in resource-limited countries.

M.A. Nasir *et al.* (2019) analysed the impact of climate change and environmental reforms on economic development. The authors noted that environmental initiatives are being actively integrated into economic policy through innovative technologies and green energy, which ensures long-term economic growth. At the same time, S. Kunkel & M. Matthess (2020) argued that environmental transformations are often perceived as secondary, which hinders the development of economies, especially in remote and underdeveloped regions. The results of the current study coincide with the conclusions of the authors regarding the importance of environmental transformations, but the authors focused more on the availability of financing for states with limited resources, while the authors emphasised technological and political aspects.

Research confirms the need to diversify the economies of post-Soviet countries, which is a key step to reducing their dependence on a limited number of sectors, including oil and gas. This dependence exposes economies to external shocks, including fluctuations in commodity prices. Implementing policies that promote the development of sustainable industries, such as the IT sector, green energy, or high-tech manufacturing, will ensure more balanced and sustainable development. A.A. Lashitew *et al.* (2021) also addressed the diversification of countries' economies. The authors argued that the main obstacle to diversification is the over-reliance on exports of raw materials, especially oil, gas and metals. Lack of access to international markets and a shortage of financial resources make it difficult to invest in innovative or sustainable industries. The current study also acknowledges the importance of diversification but focuses more on domestic reforms, investment in technology, and sustainable sectors. In contrast, the authors emphasise external factors, such as access to international markets, which are considered indirectly in the current analysis.

M. Lenzen *et al.* (2020) studied the socio-economic aspects of the resilience of economies. The authors pointed out that in developed countries, social stability and a high level of government regulation allow for effective adaptation to economic shocks, making these countries more

resilient to global crises. In contrast, some countries may face problems in social protection, which reduces their resilience in times of crisis. The current study also highlights the importance of economic resilience but places more emphasis on the importance of investing in resilient industries.

The analysis confirms that countries that effectively develop digital ecosystems and ensure their support at the international level achieve faster economic growth and strengthen their role in the global economy. The example of the United States demonstrates how investments in knowledge-intensive industries, support for start-ups, and a favourable regulatory environment contribute to leadership in digital transformation. The EU, in turn, offers a model of a balanced approach, combining innovation with high standards of privacy and digital ethics. L. Lam *et al.* (2021) studied the relationship between the level of education and the introduction of innovations. The authors concluded that in the United States, innovation development is supported by highly specialised educational programmes in technology and entrepreneurship, while in less developed countries, even a high level of basic education does not guarantee an innovative breakthrough due to a lack of specialised programmes. The current study also recognises the importance of human capital development, but the authors' results add an emphasis on specialisation.

Ș.C. Gherghina *et al.* (2020) studied the role of SMEs in the US, EU and post-Soviet countries. The authors determined that in the US and the EU, SMEs are the engine of innovation and economic development due to support through affordable credit and a favourable regulatory environment. In post-Soviet countries, SME development is hampered by excessive regulation and high cost of credit. The current study did not focus on SMEs, but the recommendations for a stable institutional environment echo the authors' findings.

In general, it is possible to state that regardless of the specific approaches of different countries, innovation, sustainability and the ability to adapt to a rapidly changing global environment remain the key factors of economic success. These three aspects are fundamental to ensuring economic growth, improving the welfare of the population and achieving global competitiveness.

Conclusions

This study examined the key conceptual approaches to adapting economic policies to current global challenges, such as globalisation, digitalisation and environmental change. The study analysed how countries, regardless of their level of development, respond to these challenges and identified strategies that ensure effective adaptation of the economy to the changing conditions of the global environment.

Adapting economic policy through a global integration strategy is a key aspect for countries seeking to ensure development through participation in international economic processes. For countries such as the US and the EU, integration into the global economy has become the basis for developing innovation, increasing competitiveness and technological progress. At the same time, for post-Soviet countries such as Ukraine, Georgia and Moldova, globalisation has opened new opportunities for access to international markets but also increased dependence on raw material exports and limited technological capabilities.

Digital change is an important aspect of competitiveness. The US has become a leader in implementing this strategy, actively supporting start-ups and investments in science and technology. In the EU, the Horizon Europe programme has allocated EUR 95.5 billion for research and innovation. For post-Soviet countries, digitalisation is both a challenge and an opportunity. In Ukraine, for example, the IT sector is successfully developing (in 2022, exports of IT services brought in more than USD 7 billion), which is an important area for economic diversification, while in countries such as Armenia and Moldova, insufficient funding and low levels of digital literacy are holding back the development of this area.

Environmental changes are also an important factor in adapting economic policies, as countries are forced to reduce the environmental impact of economic activity. The US Inflation Reduction Act provided for investments of USD 369 billion to support renewable energy, electric vehicles and green energy innovations. The EU is actively implementing the Green Deal strategy, which envisages a transition to sustainable development, by reducing greenhouse gas emissions and developing renewable energy sources. At the same time, for post-Soviet countries such as Azerbaijan and Moldova, environmental transformation is difficult due to their dependence on fossil fuels and limited financial resources.

The Transportation System Modernisation Programme approved through the Infrastructure Act, provided USD 1.2 trillion to improve roads, bridges, public transport and water supply in the US. The NextGenerationEU programme provided EUR 750 billion to modernise the economy and infrastructure of EU member states.

Another important aspect is the strategy of economic diversification. This is especially relevant for countries that are heavily dependent on one sector of the economy, such as the raw materials sector. At the same time, a socially oriented policy strategy becomes the basis for reducing social risks in times of economic crises, through support for the unemployed, education and healthcare. In general, adapting economic policies to global changes is a multifaceted and complex process that requires a comprehensive approach, to addressing global challenges and national peculiarities.

Further research could conduct a more detailed analysis of the impact of specific technologies on economic policy adaptation and the study of regional economic strategies in a changing global environment.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Abbass, K., Qasim, M.Z., Song, H., Murshed, M., Mahmood, H., & Younis, I. (2022). A review of the global climate change impacts, adaptation, and sustainable mitigation measures. *Environmental Science and Pollution Research*, 29(28), 42539-42559. doi: 10.1007/s11356-022-19718-6.

[2] Agrawal, A., Gans, J., & Goldfarb, A. (2019). Economic policy for artificial intelligence. *Innovation Policy and the Economy*, 19(1), 139-159. doi: 10.3386/w24690.

[3] Bauer, M., & Pandya, D. (2024). *ICT beyond borders: The integral role of US tech in Europe's digital economy*. Retrieved from https://www.econstor.eu/bitstream/10419/299179/1/1884550762.pdf.

[4] Camilleri, M.A. (2020). European environment policy for the circular economy: Implications for business and industry stakeholders. *Sustainable Development*, 28(6), 1804-1812. doi: 10.1002/sd.2113.

[5] Carbon Border Adjustment Mechanism. (2024). Retrieved from https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en.

[6] CHIPS and Science Act. (2022). Retrieved from https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/09/fact-sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/.

[7] Ciuła, J., Generowicz, A., Oleksy-Gębczyk, A., Gronba-Chyła, A., Wiewiórska, I., Kwaśnicki, P., Herbut, P., & Koval, V. (2024). Technical and economic aspects of environmentally sustainable investment in terms of the EU taxonomy. *Energies*, 17(10), article number 2239. doi: 10.3390/en17102239.

[8] CPUC expands existing community solar programs and launches new community solar program. (2024). Retrieved from https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-expands-existing-community-solar#:~:text=SAN%20FRANCISCO%20%E2%80%93%20The%20California%20Public,Solar%20For%20All%20grant%20recently.

[9] D'amato, D., & Korhonen, J. (2021). Integrating the green economy, circular economy and bioeconomy in a strategic sustainability framework. *Ecological Economics*, 188, article number 107143. doi: 10.1016/j.ecolecon.2021.107143.

[10] Digital Services Act. (2024). Retrieved from https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/digital-services-act_en.

[11] European Green Deal. (2019). Retrieved from https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en.

[12] Falcone, P.M. (2020). Environmental regulation and green investments: The role of green finance. *International Journal of Green Economics*, 14(2), 159-173. doi: 10.1504/IJGE.2020.109735.

[13] Gherghina, Ș.C., Botezatu, M.A., Hosszu, A., & Simionescu, L.N. (2020). Small and medium-sized enterprises (SMEs): The engine of economic growth through investments and innovation. *Sustainability*, 12(1), article number 347. doi: 10.3390/su12010347.

[14] Gurshev, O. (2023). Foreign direct investment and international trade across the former Soviet economies: What do we know after 30 years of research? *Journal of Economics and Management*, 45(1), 290-318. doi: 10.22367/jem.2023.45.12.

[15] Hintermann, B., & Zarkovic, M. (2020). Carbon pricing in Switzerland: A fusion of taxes, command-and-control, and permit markets. *ifo DICE Report*, 18(1), 35-41.

[16] Huber, R.A., Wicki, M.L., & Bernauer, T. (2020). Public support for environmental policy depends on beliefs concerning effectiveness, intrusiveness, and fairness. *Environmental Politics*, 29(4), 649-673. doi: 10.1080/09644016.2019.1629171.

[17] Inflation Reduction Act. (2022). Retrieved from https://www.irs.gov/inflation-reduction-act-of-2022.

[18] Infrastructure Investment and Jobs Act. (2021). Retrieved from https://www.congress.gov/bill/117th-congress/house-bill/3684.

[19] International Renewable Energy Agency. (2024). *Renewable energy statistics 2024*. Retrieved from https://www.irena.org/Publications/2024/Jul/Renewable-energy-statistics-2024.

[20] Janczak, J. (2019). Cross-border cooperation and economic growth in the post-crisis European Union: Economic, social and normative dimensions. In T. Brańka & J. Skrzypczyńska (Eds.), *Getting Europe back to work. Crisis (re) production and crisis overcoming in Europe* (pp. 23-32). Poznań: Scientific Publisher of the Faculty of Political Science and Journalism.

[21] Kazancı, B.A., & Arslan, O.F. (2024). Energy supply security and trade routes competition between European and Asian countries: The geoeconomic importance of Azerbaijan. *MANAS Sosyal Araştırmalar Dergisi*, 13(4), 1272-1283. doi: 10.33206/mjss.1412078.

[22] Kharaishvili, E., & Atanelishvili, T. (2022). Sustainable state procurements and business in Georgia. *Bulletin of the Georgian National Academy of Sciences*, 16(3), 122-129.

[23] Kim, S.-C., Chung, J.-K., Trusova, N., Akhmetova, Z., & Musayeva, N. (2025). Simulating global supply chain reverberations from Ukrainian grain shipment interruptions. *Revista Iberoamericana de Viticultura Agroindustria y Ruralidad*, 12(34), 192-207. doi: 10.35588/3c9rjg57.

[24] Kunkel, S., & Matthess, M. (2020). Digital transformation and environmental sustainability in industry: Putting expectations in Asian and African policies into perspective. *Environmental Science & Policy*, 112, 318-329. doi: 10.1016/j.envsci.2020.06.022.
[25] Lam, L., Nguyen, P., Le, N., & Tran, K. (2021). The relation among organizational culture, knowledge management, and innovation capability: Its implication for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), article number 66. doi: 10.3390/joitmc7010066.
[26] Lashitew, A.A., Ross, M.L., & Werker, E. (2021). What drives successful economic diversification in resource-rich countries? *The World Bank Research Observer*, 36(2), 164-196. doi: 10.1093/wbro/lkaa001.
[27] Lenzen, M., Li, M., Malik, A., Pomponi, F., Sun, Y.Y., Wiedmann, T., Faturay, F., Fry, J., Gallego, B., Geschke, A., Gómez-Paredes, J., Kanemoto, K., Kenway, S., Nansai, K., Prokopenko, M., Wakiyama, T., Wang, Y., & Yousefzadeh, M. (2020). Global socio-economic losses and environmental gains from the Coronavirus pandemic. *PloS One*, 15(7), article number e0235654. doi: 10.1371/journal.pone.0235654.
[28] Leshchenko, K. (2023). Current challenges of agricultural trade liberalisation between Ukraine and the EU. *Ekonomika APK*, 30(3), 10-17. doi: 10.32317/2221-1055.202303010.
[29] Matthess, M., & Kunkel, S. (2020). Structural change and digitalization in developing countries: Conceptually linking the two transformations. *Technology in Society*, 63, article number 101428. doi: 10.1016/j.techsoc.2020.101428.
[30] Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*, 5(1), article number 1653531. doi: 10.1080/23311886.2019.1653531.
[31] Morrison, C., & Rossi, U. (2022). *For a marxist analysis of the geopolitical crisis in the post-Soviet space*. Retrieved from https://www.euronomade.info/for-a-marxist-analysis-of-the-geopolitical-crisis-in-the-post-soviet-space/.
[32] Murphy, J., & Gouldson, A. (2020). Environmental policy and industrial innovation: Integrating environment and economy through ecological modernisation. *Geoforum*, 31(1), 33-44. doi: 10.1016/S0016-7185(99)00042-1.
[33] Musayeva, N., Atakishiyeva, N., Mammadova, U., Tanriverdiyeva, G., & Lemishko, O. (2024). The impact of trade policy on the export of agricultural products of Azerbaijan. *Scientific Horizons*, 27(11), 141-152. doi: 10.48077/scihor11.2024.141.
[34] Nasir, M.A., Huynh, T.L., & Tram, H.T. (2019). Role of financial development, economic growth & foreign direct investment in driving climate change: A case of emerging ASEAN. *Journal of Environmental Management*, 242, 131-141. doi: 10.1016/j.jenvman.2019.03.112.
[35] Nosova, O., Pavlov, K., Asadullina, N., & Nosova, T. (2020). Forms of the economy digitalization in the post-soviet space. *Bulletin of VN Karazin Kharkiv National University Economic Series*, 99, 6-14. doi: 10.26565/2311-2379-2020-99-01.
[36] Notteboom, T., Pallis, T., & Rodrigue, J.P. (2021). Disruptions and resilience in global container shipping and ports: The COVID-19 pandemic versus the 2008-2009 financial crisis. *Maritime Economics & Logistics*, 23(2), article number 179-210. doi: 10.1057/s41278-020-00180-5.
[37] Oloyede, A.A., Faruk, N., Noma, N., Tebepah, E., & Nwaulune, A.K. (2023). Measuring the impact of the digital economy in developing countries: A systematic review and meta-analysis. *Heliyon*, 9(7), article number e17654. doi: 10.1016/j.heliyon.2023.e17654.
[38] Parkhomets, M., Uniiat, L., Chornyi, R., Chorna, N., & Hradovyi, V. (2023). Efficiency of production and processing of rapeseed for biodiesel in Ukraine. *Agricultural and Resource Economics*, 9(2), 245-275. doi: 10.51599/are.2023.09.02.11.
[39] Paycheck Protection Program. (2021). Retrieved from https://www.sba.gov/funding-programs/loans/covid-19-relief-options/paycheck-protection-program.
[40] Pérez, M.D., Scholten, D., & Stegen, K.S. (2019). The multi-speed energy transition in Europe: Opportunities and challenges for EU energy security. *Energy Strategy Reviews*, 26, article number 100415. doi: 10.1016/j.esr.2019.100415.
[41] Radaelli, C.M. (2023). Europeanization in public policy. In M. van Gerven, C. Rothmayr Allison & K. Schubert (Eds.), *Encyclopedia of public policy* (pp. 1-5). Cham: Springer. doi: 10.1007/978-3-030-90434-0_55-1.
[42] REPowerEU. (2022). Retrieved from https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en.
[43] Reznikova, N., Bulatova, O., Yatsenko, O., & Ivashchenko, O. (2022). Fiscal instruments of regulatory competition in the face of challenges to macroeconomic stability during a pandemic COVID-19. *Economics of Development*, 21(2), 35-41. doi: 10.57111/econ.21(2).2022.35-41.
[44] Robinson, N. (2019). Path dependency, global economy and post-communist change. In N. Robinson (Ed.), *Reforging the weakest link* (pp. 106-126). London: Routledge. doi: 10.4324/9781351150569-6.
[45] Sanchez-Montanes, B., Romero-Ojeda, J.-M., & Castilla, M.V. (2023). The impact of overtourism on architecture and urban space in historic cities: An understudied phenomenon. *Journal of Tourism Analysis*, 30(1), 89-121. doi: 10.53596/jta.v30i1.439.
[46] Silagadze, A. (2022). Contemporary global economic trends: Transitional economies during Covid-depression. *Bulletin of the Georgian National Academy of Sciences*, 16(3), 130-135.

[47] Ulnicane, I., Knight, W., Leach, T., Stahl, B.C., & Wanjiku, W.G. (2021). Framing governance for a contested emerging technology: Insights from AI policy. *Policy and Society*, 40(2), 158-177. doi: 10.1080/14494035.2020.1855800.
[48] United Nations Conference on Trade and Development. (2024). *Digital economy report*. Retrieved from https://unctad.org/publication/digital-economy-report-2024.
[49] Van Tran, N., Alauddin, M., & Van Tran, Q. (2019). Labour quality and benefits reaped from global economic integration: An application of dynamic panel SGMM estimators. *Economic Analysis and Policy*, 63, 92-106. doi: 10.1016/j.eap.2019.04.014.
[50] Wolff, S., & Ladi, S. (2020). European Union responses to the covid-19 pandemic: Adaptability in times of permanent emergency. *Journal of European Integration*, 42(8), 1025-1040. doi: 10.1080/07036337.2020.1853120.
[51] World Bank. (2024). *Ease of doing business rankings*. Retrieved from https://archive.doingbusiness.org/en/rankings.
[52] World Intellectual Property Organisation. (2024). *Global Innovation Index*. Retrieved from https://www.wipo.int/web-publications/global-innovation-index-2024/en/.
[53] Yuan, S., Musibau, H.O., Genç, S.Y., Shaheen, R., Ameen, A., & Tan, Z. (2021). Digitalization of economy is the key factor behind fourth industrial revolution: How G7 countries are overcoming with the financing issues? *Technological Forecasting and Social Change*, 165, article number 120533. doi: 10.1016/j.techfore.2020.120533.
[54] Zameer, H., Shahbaz, M., & Vo, X.V. (2020). Reinforcing poverty alleviation efficiency through technological innovation, globalization, and financial development. *Technological Forecasting and Social Change*, 161, article number 120326. doi: 10.1016/j.techfore.2020.120326.
[55] Zubiashvili, T., Silagadze, A., & Kutubidze, I. (2023) The impact of migration on the development of economy and demography of Georgia in the period of globalization. *Bulletin of the Georgian National Academy of Sciences*, 17(3), 135-144.

Адаптація економічної політики США, ЄС та пострадянських країн до нових реалій глобальної економіки: порівняльний аналіз

Автанділ Сілагадзе
Доктор економічних наук, професор
Тбіліський державний університет
0179, просп. Іллі Чавчавадзе, 1, м. Тбілісі, Грузія
https://orcid.org/0000-0001-7782-9827
Ельгуджа Меквабішвілі
Доктор економічних наук, професор
Тбіліський державний університет
0179, просп. Іллі Чавчавадзе, 1, м. Тбілісі, Грузія
https://orcid.org/0009-0001-9675-4012
Георгій Гаганідзе
Кандидат економічних наук
Тбіліський державний університет
0179, просп. Іллі Чавчавадзе, 1, м. Тбілісі, Грузія
https://orcid.org/0000-0002-6530-1600
Тамар Атанелішвілі
Доктор економічних наук, професор
Тбіліський державний університет
0179, просп. Іллі Чавчавадзе, 1, м. Тбілісі, Грузія
https://orcid.org/0000-0003-2567-0337
Міхеїл Чіквіладзе
Професор
Тбіліський державний університет
0179, просп. Іллі Чавчавадзе, 1, м. Тбілісі, Грузія
https://orcid.org/0009-0009-0683-6806

Анотація. Метою дослідження був розгляд впливу глобальних економічних змін на національні економічні стратегії та особливостей адаптації економічної політики країн до нових умов. У дослідженні проаналізовано сучасні підходи до адаптації економічної політики в умовах глобалізації, діджиталізації та екологічних викликів. Оцінено стратегічні напрями економічної політики, що стосуються інтеграції у світові економічні процеси, цифрової трансформації, сталого розвитку, диверсифікації економіки та соціальної орієнтації. Першим аспектом була глобальна інтеграція, яка передбачала відкриття ринків, розвиток міжнародного співробітництва та активну участь у глобальних виробничих ланцюгах. Другим важливим напрямком була адаптація до цифрових змін, що включала впровадження новітніх технологій, таких як штучний інтелект, блокчейн та аналітика великих даних. Крім того, було наголошено на важливості сталого розвитку як основи для забезпечення екологічної безпеки та економічного зростання. Аналіз досвіду США, Європейського Союзу та пострадянських країн визначив, що пріоритетами економічної політики мають бути інновації, енергоефективність та цифрова трансформація. Для США характерна підтримка інноваційних стартапів, розвиток цифрових технологій та енергетичної трансформації через програми. Європейський Союз активно інвестує у відновлювану енергетику та цифрову трансформацію, впроваджуючи стратегії зеленої економіки. Пострадянські країни, включаючи Україну, Грузію та Молдову, стикаються з викликами, пов'язаними з реформами, обмеженими ресурсами та інтеграцією до Європейського Союзу. Однак ці країни вже досягають прогресу в енергетичній трансформації, цифровому розвитку та регіональному співробітництві. Для забезпечення сталого економічного розвитку країни повинні гнучко адаптувати свою політику до глобальних викликів, інтенсифікувати цифрову трансформацію та енергетичну трансформацію, а також інвестувати в інновації та регіональне співробітництво

Ключові слова: енергетична безпека; діджиталізація; екологічні проблеми; COVID-19; регулювання ринку

Scientific Bulletin
of Mukachevo State University

Series
Economics

Volume 11, No. 4, 120-132
Journal homepage: https://economics-msu.com.ua/en

UDC 338.24:334.7(477)
DOI: 10.52566/msu-econ4.2024.120

Optimisation of the strategy of state support for small and medium-sized enterprises at the regional level through investment and innovation measures

Mariya Ustymenko*
Postgraduate Student
Ivan Franko National University of Lviv
79000, 1 Universytetska Str., Lviv, Ukraine
https://orcid.org/0009-0008-9589-2713

Abstract. The purpose of this study was to develop an optimised strategy for state support of small and medium-sized enterprises at the regional level of Ukraine through the implementation of innovation and investment measures aimed at increasing their competitiveness and sustainability in the face of current economic challenges. The study was based on the analysis of key challenges faced by small and medium-sized enterprises, such as limited access to financial resources, low level of innovation, difficulties in integrating into international markets, and insufficient cooperation with research institutions and government agencies. The analysis covered three regions of Ukraine: Kyiv, Lviv, and Dnipro regions. The key findings of this study included the development of recommendations to improve the effectiveness of state support for small and medium-sized enterprises, which should account for regional characteristics and needs. It was proposed to introduce innovation clusters to strengthen cooperation between businesses, research institutions, and government agencies to create innovative products and services. The study also emphasised the significance of business digitalisation, which would increase the efficiency of small and medium-sized enterprises, reduce costs, and facilitate access to new markets. Particular attention was paid to the need to attract private investment through public-private partnership mechanisms to finance innovative projects, which would help modernise enterprises and increase their competitiveness both nationally and internationally. Specifically, the introduction of innovation clusters will not only stimulate the development of advanced technologies but will also facilitate the exchange of knowledge between enterprises and research institutions, which will increase the overall level of innovation in the regions. For this, it is necessary to create a favourable environment for the development of such clusters, including financial support, tax incentives, and training programmes for entrepreneurs. Another significant aspect is the development of digital technologies that can transform business processes in small and medium-sized enterprises

Keywords: economic modernisation; entrepreneurship; financial instruments; competitive advantages; investment

Received: 27.08.2024, Revised: 22.11.2024, Accepted: 27.12.2024

Suggested Citation: Ustymenko, M. (2024). Optimisation of the strategy of state support for small and medium-sized enterprises at the regional level through investment and innovation measures. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 120-132. doi: 10.52566/msu-econ4.2024.120.

*Corresponding author

Introduction

In the face of current challenges, such as military operations, small and medium-sized enterprises (SMEs) play an indispensable role in maintaining the economy and social stability. They drive innovation and create new opportunities for growth. SMEs provide employment for the local population, which helps to maintain social equilibrium in turbulent times. However, the war has severely limited their access to necessary resources, including finance, technology, and markets, complicating their operations. Government support becomes critical, and one of the key instruments of this support is tax incentives, grant programmes, and other forms of public funding that help businesses recover. Innovation and investment measures help not only to restore businesses but also to adapt them to new market conditions, which is particularly significant in the post-war period.

Cooperation between the government, business, and academic institutions can create more opportunities for SME development through the introduction of innovative solutions and investments in key sectors. These investments can help modernise production, automate processes, and improve business efficiency overall. The involvement of scientific institutions is also important for creating innovative technologies and solutions that will allow SMEs to stay competitive in the global market (Lutska *et al.*, 2022). Furthermore, it is necessary to implement long-term strategies that will ensure the sustainability of enterprises and their adaptation to new reality, ensuring economic recovery and growth. This approach will not only support small and medium-sized businesses during the crisis, but also ensure their development in the post-war period. Public investment, along with the involvement of the private sector, can substantially enhance the country's innovation potential and facilitate its integration into the global economy. Furthermore, it is essential to adapt SMEs to new market conditions and create mechanisms for rapid response to crises. The war and its aftermath create new challenges for businesses that require flexible risk management and planning strategies (Potryvaieva *et al.*, 2024). One of the key aspects is the development of digital technologies and the introduction of innovations that will enable businesses to increase their competitiveness. Amidst limited access to conventional markets, SMEs can develop e-commerce and seek new opportunities to export their goods and services. N. Smentyna (2012) studied SME support at the level of territorial communities during martial law. The researcher emphasised the significance of local self-government in economic recovery, specifically on the example of the Pokrovsk territorial community. However, the study pointed to problems with orders, tax revenues, and the lack of long-term support mechanisms after the war.

M.M. Berdar & R.A. Yaremko-Hladun (2024) investigated the innovation and investment model for the development of small and medium-sized enterprises in Ukraine, focusing on innovative methods and economic modernisation. The researchers emphasised the significance of digitalisation and automation of business processes, as well as government support and financing instruments. L.V. Lukashova (2019) explored the innovative approaches to small business development in Ukraine and legislative conflicts that prevented SMEs from receiving support. The researcher compared support programmes in Ukraine and abroad, focusing on the innovative potential of agriculture. The need to improve the legislative framework and introduce innovative methods was emphasised, although no concrete recommendations for improving the legislation were given. L. Karpenko *et al.* (2023) studied the instruments of state support for small and medium-sized businesses in Ukraine during martial law. The researchers noted the role of state regulation and support, particularly during the hostilities, when many businesses stopped working or relocated. The key measures included lower lending rates, rent compensation, and tax changes. Some government grants and relocation programmes have been allocated, but there is a lack of a long-term strategy to restore and support small businesses in remote regions. V.O. Butkova (2023) investigated the development of small business in Ukraine, focusing on its flexibility and adaptation to market changes. The researcher noted the lack of state support, financial instability, and lack of personnel, suggesting simplification of tax conditions and advisory support.

T.Y. Melnyk (2022) explored the state support for business during martial law. The key measures included tax privileges, a simplified taxation system, reorganisation of enterprises, and the Affordable Loans 5-7-9% programme. The researcher noted that the state has taken crucial steps to support business but lacks a long-term strategy for economic recovery after the war. T.M. Lozynska & V.V. Slichenko (2022) investigated the state aid to small businesses during martial law. The researchers noted that the principal measures were tax burden reduction, financial support, relocation of enterprises, and grant programmes such as E-Robota. However, the researchers stressed the lack of long-term plans for small business recovery after the war. T. Matsuzaki *et al.* (2020) studied the support for small businesses through tax changes and financial programmes. The researchers emphasised the flexibility of enterprises and the significance of grants and consultations but noted that current strategies do not consider innovative and long-term programmes after the war.

The purpose of this study was to optimise the mechanisms of state support for small and medium-sized enterprises with a focus on long-term innovative strategies and financial instruments that will contribute to sustainable economic development at the regional level in the face of constant challenges. The objectives of this study were to analyse the existing model of state support for small and medium-sized enterprises and their effectiveness, considering current challenges. In addition, the study aimed to develop innovation and investment strategies to support SMEs at the regional level, focused on long-term development, business stability, and adaptation to changing economic conditions.

Materials and Methods

To fulfil the purpose of the study, a comprehensive methodology was employed, which included several stages to achieve the objectives. The study was conducted over two years, from 2022 to 2024, at SMEs located in various regions of Ukraine. The key regions for collecting empirical data included Kyiv, Lviv, and Dnipro regions. These regions were chosen due to their different levels of entrepreneurship development, the availability of state and international support programmes, and the specifics of regional economic conditions, which enabled a more representative set of findings.

Three enterprises were selected for the study: Innovative Technologies LLC (Kyiv region), EcoAgro PE (Lviv region), and DniproMet LLC (Dnipro region), each representing diverse industries and regional specifics. The purpose of the analysis was to identify the strengths and weaknesses of these enterprises, as well as the opportunities and threats that affect their development. This approach offered a deeper understanding of the factors contributing to success and the factors hindering development and helped to formulate recommendations for improving their operations and competitiveness. The first stage of the study involved the method of regulatory analysis, which involved reviewing such documents as the Law of Ukraine No. 4618-VI "On the Development and State Support of Small and Medium-Sized Enterprises in Ukraine" (2012). This method enabled a detailed investigation of government initiatives, including the State business support programme Affordable Loans 5-7-9% (2024) and E-Robota (2024), which provide favourable conditions for obtaining financing for business development, as well as grant programmes for the relocation of businesses affected by the hostilities. This analysis showed that such initiatives substantially facilitate SMEs' access to the necessary resources, helping them avoid bankruptcy in times of crisis.

At the next stage of the study, the method of economic analysis was used to investigate the key indicators of the development of small and medium-sized enterprises in these regions. The indicators to be analysed included the volume of investment in enterprise development, the number of jobs created, the overall employment rate, the income of enterprises before and after participation in government support programmes, the level of use of innovative technologies to improve production efficiency, and the level of government support received by enterprises at different stages of their operations. The data was collected using statistical analysis, specifically, the materials by Ukrstat (2022), which helped to assess the effectiveness of state and international support programmes for small and medium-sized enterprises in different regions. This method helped to compare findings across regions and identify key challenges faced by entrepreneurs.

A vital element of the methodology was the use of a Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis, which helped to identify the strengths of enterprises, such as flexibility and the ability to quickly adapt to changes in market conditions, and weaknesses, such as limited resources for innovation. The analysis also helped to identify opportunities for development, such as attracting new investments and developing international cooperation, as well as threats to their development in the crisis, such as increased competition, political instability, and limited access to financial resources, which can complicate project implementation. In addition, other external factors, such as changes in legislation, technological innovations, and social changes, which may also affect the development of enterprises in the long term, were considered.

Results

In the context of the current development of Ukraine's economy, a key task is to ensure sustainable development (SMEs), especially at the regional level. SMEs play a key role in ensuring economic stability, creating new jobs, and implementing innovative solutions. However, their development is accompanied by a series of challenges, such as limited access to financial resources, low adoption of innovative technologies, and difficulties in integrating into international markets.

That is why special attention should be paid to the development of state support mechanisms for SMEs that would facilitate their sustainable development through innovation and investment measures (Law of Ukraine No. 4618-VI, 2012). Effective models of state support should be tailored to regional specificities and provide access to finance, human capital development, support for innovation, and ease of doing business. Both government programmes, such as the programme Affordable Loans 5-7-9% (2024), and international institutions that provide financial aid for the development of enterprises in crisis conditions, play a significant role in this process.

The need to optimise support mechanisms is confirmed by numerous studies and regulatory documents, such as A "Small Business Act" for European SMEs (2016), which emphasises the significance of access to innovation and finance for SMEs. Another significant document is "Businesses, experts, donors, and regions will be involved in the development of the SME recovery strategy until 2027", which emphasises the role of innovation and international cooperation (Ministry of Economy of Ukraine, 2024). These documents emphasise the need to adapt government strategies to changing market conditions and the significance of creating a favourable business environment for enterprise development. To analyse the development of small and medium-sized enterprises in different regions of Ukraine, the study examined the key indicators such as investment volumes, number of jobs created, employment, revenues, introduction of innovative technologies, and participation in government programmes, as presented in Table 1.

Table 1. SME development indicators in Kyiv, Lviv, and Dnipro regions (2022-2023)

Indicator	Kyiv region	Lviv region	Dnipro region
Investment volumes (UAH mln)	150	120	80
Jobs created	3,500	2,700	1,800
Employment level (%)	65	58	50
Implementation of innovative technologies (%)	70	60	45

Source: created by the author based on Ukrstat (2022) and M. Sudakov & L. Lisogor (2023)

The Table 1 demonstrates that Kyiv region scores higher on all parameters, which may be associated with a more developed economic infrastructure, concentration of large enterprises, and access to national and international investment resources. This can also be explained by the region's well-developed banking system, a wide range of financial institutions and government agencies, which provide entrepreneurs with better opportunities to raise funds. Additionally, the capital region has greater access to human resources, innovation centres and technology clusters, which facilitates the faster adoption of the latest technologies in business.

The Lviv region's performance also shows steady growth, driven by the positive dynamics of agricultural and manufacturing enterprises, export expansion and a gradual increase in innovation activity. The geographical location of Lviv region close to the EU border provides the region with additional competitive advantages, as businesses are actively integrating into international supply chains. This allows businesses in the region to attract investment and expand export opportunities, which positively impacts employment and economic growth.

The Dnipro region, which has been severely affected by the hostilities, performs worse in terms of investment and employment. This is a result of damage to infrastructure, the relocation of businesses, and a temporary decline in economic activity. Limited access to financial resources due to the unstable situation also hinders business development in the region. Despite these challenges, Dnipro region has considerable potential for recovery and growth due to its industrial capacity and strategic significance for the national economy.

The state business support programme Affordable Loans 5-7-9% (2024) is a crucial state support tool that provides businesses with access to finance on favourable terms. However, its implementation has substantial regional differences. Kyiv region has the highest level of participation in the programme. This is explained by a greater level of economic activity and a growing number of enterprises willing to invest in expanding their capacities. Furthermore, entrepreneurs in this region have greater access to information about the programme, which contributes to a more active use of concessional lending opportunities.

Lviv region also demonstrates strong engagement of enterprises in the programme, which is explained by the active development of small businesses in the region and favourable conditions for the development of export-oriented industries. A key factor is the support of state and regional initiatives aimed at modernising production processes and introducing innovations. In contrast, Dnipro region demonstrates considerably lower performance. This is caused not only by the economic instability of the region, but also by the limited opportunities to attract enterprises to take part in the programme. Entrepreneurs face difficulties in submitting documents and ensuring compliance with the programme's conditions amid the complex economic circumstances. The involvement of the three regions in the programme is presented in Table 2.

Table 2. Participation of SMEs in the Affordable Loans 5-7-9% programme by region (2022-2023)

Region	Number of enterprises that received loans	Total amount of loans issued (UAH mln)
Kyiv region	450	320
Lviv region	320	240
Dnipro region	180	110

Source: created by the author based on Ukrstat (2022) and the state business support program Affordable Loans 5-7-9% (2024)

The Table 2 shows that Kyiv and Lviv regions have substantial advantages in the participation of enterprises in the programme, which indicates higher business activity and more effective implementation of state support. The E-Robota (2024) programme is no less important than the previous one and provides grants to support entrepreneurs, especially those who create new jobs. In 2022, over UAH 5 billion was allocated under this programme, which helped support more than 10,000 SMEs. These funds were used to modernise production, purchase the latest equipment, and implement innovative solutions. The programme has become a valuable tool for stimulating the development of entrepreneurship in various sectors of the economy. During the first year of the programme, companies that received grants created around 25,000 new jobs. This positively influenced the employment, especially in the regions that suffered the most from the economic consequences of the war. The regional distribution of grants shows that Kyiv, Lviv,

and Odesa regions are the leaders in terms of the number of grants issued. More than 3,000 companies were supported in Kyiv region, about 2,000 in Lviv region, and over 1,500 in Odesa region. This demonstrates the active economic activity in these regions and the strong level of entrepreneurial initiative. The programme has positively affected the entrepreneurship in multiple sectors of the economy, including agriculture, manufacturing, and services. Specifically, the agricultural sector has received around 40% of the total allocated funds, which is vital for ensuring the country's food security and stimulating the economy in a crisis.

An analysis of the state support suggests that the E-Robota programme is proving to be effective, with a considerable increase in the number of new jobs and support for entrepreneurship in key sectors of the economy. The allocation of grants in various sectors helps to support economic diversification, particularly through the modernisation of the agricultural sector and support for technology start-ups. However, the programme needs to be further expanded, especially in the regions that have suffered the greatest losses due to the hostilities. The regional imbalance in the number of grants awarded points to the need for better communication between the state and entrepreneurs in less active regions to ensure that businesses are supported evenly across the country. The government's E-Robota programme is an effective tool for developing entrepreneurship and creating new jobs, but it needs additional mechanisms to attract more entrepreneurs from the affected regions. Expanding the programme and adapting it to regional needs would help to ensure a more sustainable economic recovery.

One of the most effective methods of SME development is clustering, especially in sectors that can bring together businesses with common interests (Trusova *et al.*, 2020). According to international practices, clusters facilitate close cooperation between companies, research institutions, and government agencies, which increases productivity and competitiveness. For instance, clustering has contributed to the development of tourism and production chains in Kyrgyzstan. This method has allowed attracting new investments and creating supporting infrastructure, such as logistics chains and training centres. This has made businesses more efficient and more resilient to market changes (Hasanova, 2019). In Ukraine, clustering could be applied in the agricultural sector, the technology industry, and regional manufacturing, contributing to increased innovation and better coordination between businesses.

Technology incubators, especially innovation enterprises, are another major tool for promoting SME development. Technology incubators and accelerators, such as iDEA, provide entrepreneurs in many African countries, such as Nigeria and Kenya, with a variety of support, including mentoring, market access, training, and financial support. This enables young companies to grow quickly and adapt to the modern market (AU Strategy for SME/I Development..., 2019). In Ukraine, the creation of such innovation hubs could greatly contribute to the development of a start-up culture, support technological initiatives, and provide small businesses with the opportunity to innovate. This is crucial for regions that have suffered economic impact from the war, where incubators could help restore economic activity by stimulating innovative ideas and entrepreneurial initiatives.

The modern development of small and medium-sized enterprises depends on digital transformation. Digital innovation hubs in the Czech Republic help companies implement the latest technologies, enabling them to increase productivity and compete on international markets. Companies gain access to modern technologies through programmes aimed at digitalising production processes, which help them develop their IT capacities and integrate the latest developments into their business model (Strategy to Support SMEs in..., 2021). For Ukraine, digital transformation is critical, as a strong digital infrastructure will help businesses adapt to changing market conditions more quickly. The introduction of digital solutions can help businesses optimise internal processes, improve communication with customers, and enter new markets. Access to finance is one of the key aspects of SME development. The Czech Republic's experience suggests that the active engagement of private capital in the form of venture capital funds and business angel networks can substantially accelerate the growth of start-ups and innovative companies. Establishing public-private partnerships for SME financing in Ukraine could provide entrepreneurs with better access to long-term loans, reducing risks for investors. Furthermore, venture capital funds could focus on supporting start-ups in the IT, agribusiness, and renewable energy sectors, which have robust growth potential.

The use of such financial instruments would allow Ukrainian SMEs to improve their innovation activity significantly and bring new products and services to the market that would meet international standards. Thus, the implementation of these international practices in Ukraine could dramatically improve the effectiveness of state support for SMEs, stimulate innovation and contribute to economic recovery in the face of the challenges of war and crisis. To develop innovative and investment strategies for SME support at the regional level that focus on long-term development, entrepreneurial sustainability, and adaptation to changing economic conditions, several interrelated strategic areas should be implemented. These strategies should combine support for innovation, investment promotion, development of digital technologies, business efficiency, and export potential. The strategies should be integrated at the regional level, considering their specific needs and capabilities. One of the key strategies to support SMEs is the creation of regional innovation clusters that ensure interaction between enterprises, research institutions, incubators, accelerators, and local authorities. Such clusters will facilitate innovation, infrastructure sharing, and knowledge exchange. Within the framework of this strategy, the government should provide financial support for the development of innovation clusters, including the

creation of technology parks, innovation hubs, and incubation centres in the regions.

The purpose of this strategy is to create conditions for sharing infrastructure, promoting innovation, and attracting investors to support innovative start-ups and SMEs. The clusters will be able to help boost research and development, create new products and services, and increase the commercialisation of innovations. Providing access to modern technologies and infrastructure for research and development (R&D) is a crucial element. The development indicators presented in Table 3 demonstrate key aspects of the effectiveness of regional innovation clusters, which are one of the strategic areas of SME support. These indicators were selected because they best illustrate the impact of innovation clusters on SME development in the regions. Clusters promote cooperation between companies, research institutions, and government agencies, which stimulates the development of innovative products and technologies.

Table 3. Key indicators of innovation development through regional clusters

Indicator	Expected outcome
Innovation clusters created	10-15 in the first 5 years
New innovative products	Increase by 25% annually
Investment in technology incubators	UAH 200 million per year

Source: created by the author based on S. Hasanova (2019)

The data in Table 3 demonstrate that the introduction of innovation clusters at the regional level can considerably increase the competitiveness of SMEs. It is expected that by creating an innovative infrastructure and stimulating scientific research, the number of innovative products will increase by 25% annually, enabling enterprises to introduce the latest technologies and improve their performance more actively. This approach will also help to attract investment in innovative technologies and stimulate the development of incubation programmes. Attracting investment is a key aspect of the SME support strategy at the regional level. The investment strategy envisages the creation of public-private partnerships that will provide access to finance for SMEs through regional investment funds and venture capital funds. The government should encourage investors through tax incentives and guarantees, enabling private investors to cooperate with government agencies to finance innovative projects in the areas of manufacturing, technology, and agribusiness.

The strategy also envisages the development of regional investment platforms where businesses can present their projects and receive funding through public-private agreements. This will help increase the number of successfully funded start-ups and stimulate the development of innovative sectors of the economy. The key performance indicators for this strategy, presented in Table 4, include the number of private investors attracted, the number of new investment deals, and the total amount of investment. These indicators were chosen as an example to illustrate the potential outcomes of implementing the investment strategy through public-private partnerships. They demonstrate the potential for attracting significant investment to the regions and stimulating innovative SME development through new financial mechanisms.

Table 4. Key indicators of the investment strategy through public-private partnerships

Indicator	Expected outcome
Private investors involved in SMEs	300-500 per year
New investment deals	50 new deals annually
Total investment volume	UAH 1 billion annually through partnerships

Source: created by the author based on Strategy to Support SMEs in the Czech Republic 2021-2027 (2021)

The data in Table 4 suggest that attracting private investment through public-private partnerships can substantially improve SMEs' access to finance. It is estimated that over 50 new investment agreements will be concluded each year, which will increase investment flows to UAH 1 billion per year. Such a strategy will stimulate innovation and the expansion of SMEs' production capacities, increasing their financial resilience and ability to adapt to changing market conditions. Digitalisation is an essential factor for improving the efficiency of SMEs and adapting to the current economic environment. The digital transformation strategy includes the introduction of innovative technologies, automation of business processes, and the development of digital marketing tools, which enables businesses to enter new markets and reduce costs. Regional digitalisation programmes should provide SMEs with access to training, advice, and technical support to implement digital solutions such as CRM systems, cloud services, and artificial intelligence.

The purpose of this strategy is to ensure that businesses are digitally integrated into global supply chains, increase their efficiency, and reduce production costs. Furthermore, digital transformation will enable businesses to better interact with customers through online platforms, which will contribute to their growth. The indicators of the digital business transformation strategy are highlighted in Table 5.

Table 5. Key indicators of a digital business transformation strategy

Indicator	Expected outcome
Share of enterprises that have implemented digital solutions	60% of SMEs by 2025
Reducing operating costs for SMEs	15-20% due to digitalisation
Increased profitability	Increase by 10-15% annually

Source: created by the author based on Strategy to Support SMEs in the Czech Republic 2021-2027 (2021)

These indicators were chosen to reflect the key outcomes of implementing a digital transformation strategy for SMEs. The share of enterprises that have implemented digital solutions is a significant indicator, as digitalisation plays a key role in increasing the competitiveness of enterprises, automating processes, and improving management. Table 5 suggests that business digitalisation is an indispensable tool for increasing the efficiency and competitiveness of SMEs. It is expected that by 2025, around 60% of businesses will have implemented digital solutions, which will reduce their operating costs by 15-20% and increase their profitability by 10-15% annually. This underscores the role of digital transformation as a factor in helping businesses adapt to modern market requirements. The SME export development strategy involves facilitating access to international markets through product certification, access to export credits, and risk insurance. Ukrainian SMEs should have access to international certification and export support programmes to enable them to expand their business abroad. The state should create export hubs that will provide companies with consulting support, assistance in preparing documents, and participation in international exhibitions and fairs. This strategy will help companies develop new markets, integrate into global supply chains, and increase their competitiveness. Another essential element of the strategy is the creation of financing mechanisms for export-oriented SMEs, including state support through export credits. The indicators of the strategy to support exports and international integration are presented in Table 6.

Table 6. Key indicators of the export support and international integration strategy

Indicator	Expected outcome
SMEs entering international markets	1,000 SMEs by 2025
SME exports	Increase by 25% annually
International contracts	200 new contracts annually

Source: created by the author based on N. Masson (2024)

The indicators in Table 6 reflect the key outcomes of the implementation of the SME export and international integration support strategy. They have been selected to demonstrate how strategic support can help SMEs enter new international markets, increase export volumes, and secure new international contracts. The last but not least element of the strategy is to stimulate innovation through the development of research and development activities and support for innovative technologies. The government should encourage businesses to innovate through grant programmes, joint laboratories, and incubators where SMEs can test new products and technologies. A significant area is the development of cooperation between universities and enterprises to create novel solutions in the areas of agribusiness, ecology, IT, and engineering.

The strategy is aimed at increasing the innovation activity of enterprises, which will enable them to implement the latest solutions and stay competitive in international markets. The indicators of the strategy to improve innovation and competitiveness are presented in Table 7.

Table 7. Key indicators of the strategy to improve innovation and competitiveness

Indicator	Expected outcome
Enterprises that have implemented innovations	500 SMEs annually
New developments and patents	100 new patents annually
Investment in research and development activities	UAH 300 million per year

Source: created by the author based on B.G. Agazu & C.A. Kero (2024)

The indicators presented in Table 7 reflect the key outcomes of the strategy to improve innovation and competitiveness for SMEs. They were chosen to demonstrate how active innovation and investment in R&D can contribute to the sustainable development of enterprises. The outcomes presented in Table 7 suggest that stimulating SME innovation by supporting R&D and the introduction of the latest technologies will considerably increase the number of new developments and patents. It is expected that about 100 new patents will be registered annually, which will increase the competitiveness of enterprises both nationally and internationally. This strategy will help businesses grow through

innovation and maintain sustainable development. These five strategies will provide comprehensive support to small and medium-sized enterprises, encouraging them to develop innovatively, attract investment, digitalise, and enter international markets. Furthermore, each enterprise has its unique characteristics and challenges that require detailed analysis. The SWOT analysis helped to identify strengths and weaknesses, as well as opportunities and threats for businesses in concrete conditions. This will help to identify priorities for further development and implementation of necessary changes. The SWOT analysis for each enterprise is presented in Tables 8-10.

Table 8. SWOT analysis for Innovative Technologies LLC (Kyiv region)

Strengths	Weaknesses
• Located in the capital, which provides access to developed infrastructure and financial resources. • Strong level of implementation of innovative technologies in production processes. • Flexibility and ability to quickly adapt to changes in market conditions. • Great level of staff qualification.	• Limited financial resources for further digitalisation and modernisation of production facilities. • Excessive costs of innovative technologies, which limits the speed of business expansion. • Dependence on large customers, which creates risks in case of loss of key clients.
Opportunities	**Threats**
• Attraction of additional investment through participation in government support programmes, such as the Affordable Loans 5-7-9% programme. • Expansion into international markets through the introduction of the latest technologies and innovations. • Increased efficiency through participation in public-private partnerships and obtaining preferential financing.	• Fierce competition from other technology companies in the capital market. • Rising energy and material costs, which may reduce profitability. • Volatility in the financial sector, which may limit access to credit resources.

Source: created by the author based on Innovative Technologies LLC (2013)

Innovative Technologies LLC has substantial advantages due to its location in the capital and the strong level of implementation of innovative technologies. However, limited financial resources and high competition in the capital market are the major challenges for the company. At the same time, attracting further investments and entering international markets may become key opportunities for the company's further development. The company has considerable potential for expansion, but it needs to overcome financing and modernisation constraints.

EcoAgro PE specialises in agriculture, where ecological production plays a key role. The SWOT analysis helped to assess how the company's internal strengths, such as favourable natural conditions and industry expertise, can be leveraged to maximise growth, and identified weaknesses and external threats that affect business stability, as presented in Table 9.

Table 9. SWOT analysis for EcoAgro PE (Lviv region)

Strengths	Weaknesses
• Favourable natural conditions for the agricultural sector in Lviv region. • Extensive experience in agricultural production and proprietary infrastructure for product processing. • Commitment to the principles of ecological production in line with current trends.	• Insufficient access to modern technologies and digital solutions to optimise processes. • Limited access to investment resources for equipment modernisation and innovation. • Dependence on seasonality of production and the impact of weather conditions on yields.
Opportunities	**Threats**
• Attraction of investments to introduce modern agricultural technologies that will increase production efficiency. • Expansion of export opportunities through participation in international certification and export support programmes. • Development of niche markets for organic products that provide higher margins.	• Competition from large agricultural enterprises. • Risks associated with fluctuations in prices for agricultural products on world markets. • Limited access to financial resources due to economic instability in the country.

Source: created by the author based on PE "ECOAGRO PRO" (2024)

EcoAgro PE has a strong position in the agricultural sector due to its favourable natural conditions and focus on ecological production. The key challenges for the company are limited access to modern technologies and investment resources, which hinders its development. However, the possibility of expanding exports of organic products and attracting investment to introduce the latest technologies opens great prospects. The company can grow if it can leverage these opportunities, particularly through government support programmes and participation in international markets. DniproMet LLC operates in the metallurgical sector, which is highly competitive and faces considerable challenges due to economic instability in the region. The SWOT analysis of this company helped to assess the inter-

nal factors that support its competitiveness, such as its proprietary industrial base, and to identify weaknesses, such as insufficient automation, as presented in Table 10. This analysis considered the opportunities for innovation and fundraising, as well as threats related to economic conditions and changes in the steel market.

Table 10. SWOT analysis for DniproMet LLC (Dnipro region)

Strengths	Weaknesses
• Proprietary industrial base and production facilities. • Extensive experience in the steel sector and well-established supply chains. • Strong position in the internal market due to long-term contracts with major customers.	• Insufficient automation and low adoption of modern technologies. • Excessive costs of modernising production processes due to economic instability. • Vulnerability to changes in regional infrastructure due to military operations.
Opportunities	**Threats**
• Participation in government support programmes, including soft loans for equipment upgrades. • Implementation of digital technologies to optimise production processes and reduce costs. • Expanding into foreign markets for steel products through integration into international supply chains.	• Economic instability in the region and the threat of production interruptions due to military operations. • Increased costs of raw materials and energy, which may reduce profitability. • Increased competition from international steel producers.

Source: created by the author based on DNEPROMET LLC (2004)

DniproMet LLC has a strong position in the internal market due to its industrial base and experience in the metallurgical sector. However, the company faces major challenges due to limited access to innovative solutions and risks associated with economic and political instability in the region. The key opportunities for further development include the modernisation of production facilities and the introduction of digital solutions to optimise processes. Despite the threats posed by the hostilities and economic difficulties, the company can grow through participation in government support programmes and export activities.

Sustainable development of enterprises in the current environment requires comprehensive state support aimed at overcoming a series of economic challenges. To successfully support SMEs, it is vital to consider the innovative potential of each region, as well as the opportunities for clustering, investment, and digital transformation. The analysis revealed that each enterprise has its specific strengths and weaknesses that can be optimised through government programmes and international practices, which will ensure the sustainable development of Ukraine's economy at the regional level.

Discussion

The study found that SMEs play a crucial role in the development of Ukraine's economy and job creation. The major challenges faced by SMEs include limited access to finance, low levels of innovation, and obstacles to integration into international markets. In this context, it becomes critical to implement innovation and investment strategies that can increase the sustainability and competitiveness of SMEs in internal and international markets. The key findings of the present study suggest that such strategies form an integral part of the successful development of enterprises in Ukraine, especially in the context of an unstable economy and external challenges.

S. Hasanova (2019) also emphasised the significance of innovation for SME development, which confirms the findings of the present study on the critical role of innovation and investment strategies. However, compared to the situation in Kyrgyzstan, where SME innovation is hampered by limited access to long-term financing, Ukraine can develop innovation through existing government programmes. Still, as the findings of the present study suggest, even with such programmes in place, access to finance is still limited, especially for SMEs in less developed regions. The analysis found that one of the most effective methods of supporting SMEs is clustering. The study showed that enterprises taking part in cluster associations have better access to finance and resources for innovation. The cluster approach promotes cooperation between enterprises and research institutions, which stimulates the development of innovative technologies and products. This conclusion is also confirmed by the findings of S. Hasanova (2019), who noted that in Kyrgyzstan, the cluster approach has also shown its effectiveness in improving cooperation between enterprises. However, in Ukraine, cluster initiatives have prospects only in certain regions, such as Kyiv and Lviv regions, where infrastructure and support are sufficiently developed. Overall, both studies confirmed the value of SMEs to the economy and outlined comparable challenges, but the extent to which they were overcome differed between Ukraine and Kyrgyzstan.

The data also revealed the value of supporting digital technologies for SME development. Digitalisation of business processes helps businesses reduce operating costs, increase efficiency, and expand their markets (Krylovskyi, 2024). These changes are particularly relevant in the context of the post-war economic recovery when businesses need quick and effective solutions to adapt to changing conditions. The data are consistent with the findings of E. Sirtori *et al.* (2024), who emphasised that innovation, specifically digitalisation, is a key factor in increasing the competitiveness of SMEs in international markets. Investment and innovation strategies are essential for the

long-term sustainability of SMEs. The study revealed that enterprises that actively attract investment in the development of innovative solutions show more stable growth rates than those that rely on conventional methods of financing. Attracting international investors and partners becomes especially important in the context of limited access to domestic financial resources. However, the study also showed that in Ukraine, innovative enterprises often face difficulties in attracting external investment due to the instability of the economy and the lack of adequate support from the state. This once again highlights the need to improve government support programmes aimed at attracting foreign investors.

Cooperation with international organisations and funds also plays a significant role in the development of SMEs in Ukraine (Sejdiu *et al.*, 2024). Data revealed that enterprises that actively cooperate with international partners have better growth and development indicators. This is explained by the fact that such enterprises have access to additional resources, technologies, and markets. For instance, projects supported by international organisations have helped businesses in Lviv region to introduce the latest technologies and expand their operations in international markets. These findings are in line with a study by the African Union (AU Strategy for SME/I Development..., 2019), which also highlighted the role of international cooperation in supporting SME development. The study paid considerable attention to the role of state support in SME development. The data suggest that government programmes aimed at supporting innovation and the introduction of the latest technologies have considerable potential for enterprise development. However, despite their effectiveness in some regions, such as Kyiv region, they often do not account for the specific needs of enterprises in less developed regions. For example, in the war-affected Dnipro region, existing programmes cannot meet all the needs of enterprises, which limits their development and the ability to innovate.

In this context, it is crucial to develop novel support mechanisms that are tailored to regional needs and the specifics of each region. For instance, support for businesses in war-affected regions should include special tools to rebuild infrastructure and attract investment to develop local businesses. This could be achieved through cooperation with international organisations and investors, which would enable businesses in these regions to access the necessary resources. In this study, the development of SMEs at the regional level was measured by key indicators such as investment, employment, and the adoption of innovative technologies. At the same time, the analysis based on the study by Ș.C. Gherghina *et al.* (2022) revealed several important common and distinctive aspects. There was a convergence of studies in terms of the role of SMEs as a driver of economic growth and their significance for regional development. Both studies emphasised the role of investment in innovative technologies and their positive effects on enterprise productivity. The present study focused more on concrete indicators of regional development, such as the number of jobs created and participation in government programmes, while Ș.C. Gherghina *et al.* (2022) focused on the overall impact of innovative investments on the total turnover of enterprises. Furthermore, these findings revealed a strong regional imbalance in SME development caused by distinct conditions of access to finance and innovative technologies, while the Romanian study focused more on the impact of general macroeconomic factors.

M. Grotz *et al.* (2019) analysed economic resilience and the role of SMEs, with several aspects of this study coinciding with the findings of the present study. These researchers emphasised the role of state support for the sustainable development of enterprises. This was in line with the findings of the present study, where the analysis revealed that regional programmes played a key role in providing SMEs with financial support opportunities. Both the present study and the analysis by M. Grotz *et al.* (2019) emphasised the need to tailor support to regional needs, which helped to increase employment and the innovation potential of businesses. Furthermore, the researchers investigated the issue of innovation activity and its impact on SME development. They also pointed out that innovative development was the basis for increasing the competitiveness of enterprises. These findings confirmed these claims, as the introduction of innovative technologies, especially in Kyiv and Lviv regions, was a crucial factor in development. This indicated that innovation is a key area for strengthening the position of enterprises in both internal and international markets. The researchers emphasised the significance of attracting external investment for SME development. The present study placed the emphasis on internal support mechanisms, such as government programmes, grants, and soft loans. This was conditioned by the distinct economic realities and conditions for SMEs in different countries. Overall, as in the present study, the researchers emphasised the need for infrastructure development to support innovation, although the approach differed.

Thus, the comparison of various studies on SME development demonstrated both shared features and substantial differences related to economic conditions and the level of infrastructure development in different countries. Despite the differences in emphasis, all studies stressed the role of government support, innovation, and access to finance in ensuring the sustainability of SMEs. The successful implementation of these strategies depended on the concrete business environment and level of economic development, which required a flexible approach to support and adaptation of national and regional SME support programmes.

Conclusions

The study confirmed the crucial role of SMEs as the primary driver of economic development and employment at the regional level. However, enterprises in this segment face numerous challenges, such as limited access to financial resources, low levels of innovation activity, and barriers to integration into international markets. In such circumstances, government support is critical to ensure the sustainability and growth of enterprises. State support

programmes such as Affordable Loans 5-7-9% and E-Robota have already demonstrated their effectiveness, but further development requires improving their implementation mechanisms and increasing their coverage. It is essential to expand these programmes to sectors that are currently not covered by them and to increase the flexibility of participation conditions for entrepreneurs.

Innovative SME development strategies should focus on the introduction of modern technologies and the digitalisation of business processes. Digital transformation will improve the efficiency of enterprises, reduce operating costs, and facilitate entry into new markets. The introduction of digital tools, such as production process automation, e-commerce, and cloud technologies, will help SMEs become more competitive. In this context, the role of government initiatives aimed at supporting innovation and the introduction of the latest technologies is crucial. Furthermore, it is vital to ensure that entrepreneurs have access to training programmes that will help raise awareness of the possibilities of using modern digital tools for business development. Attracting investment to modernise production and increase the competitiveness of SMEs is a critical factor in sustainable development. Investment and innovation measures should stimulate the attraction of private capital through public-private partnerships, which will facilitate the development of new projects. The development of innovation clusters and technology parks will bring together businesses, research institutions, and government agencies to jointly develop and implement the latest technologies. This will create new opportunities for enterprises, especially in the context of limited access to foreign markets.

The analysis of regional SME support programmes in Kyiv, Lviv, and Dnipro regions revealed that each region has its specific features that require an individual approach to the implementation of support mechanisms. Kyiv region showed the best results due to its developed infrastructure and better access to investment. Dnipro region, affected by the hostilities, needs more support to restore economic activity and attract resources for infrastructure reconstruction. To improve the effectiveness of government support for small and medium-sized businesses, existing mechanisms of interaction between government agencies and businesses should be improved. Financial support programmes should not only provide immediate solutions to urgent problems, but also contribute to the long-term development of enterprises, particularly through investments in innovation and start-ups. It is also key to raise awareness among entrepreneurs of the available state and international support opportunities, especially through the creation of digital platforms for learning and interaction with partners. The present study was limited to analysing three regions of Ukraine, and therefore future research should cover a wider range of regions and sectors. In addition, further analysis of the effects of international investment and digitalisation on SME development in different sectors of the economy is a promising area.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] A "Small Business Act" for European SMEs. (2016, February). Retrieved from https://eur-lex.europa.eu/EN/legal-content/summary/a-small-business-act-for-european-smes.html.

[2] Agazu, B.G., & Kero, C.A. (2024). Innovation strategy and firm competitiveness: A systematic literature review. *Journal of Innovation and Entrepreneurship*, 13, article number 24. doi: 10.1186/s13731-024-00381-9.

[3] AU Strategy for SME/I Development in Africa. (2019, January). Retrieved from https://au.int/sites/default/files/newsevents/workingdocuments/43060-wd-AU_SME_Strategy.pdf.

[4] Berdar, M.M., & Yaremko-Hladun, R.A. (2024). Innovation and investment model for the development of small and medium-sized businesses in Ukraine. *Theoretical and Practical Research in Economic Fields*, 15(2), 174-183. doi: 10.14505/tpref.v15.2(30).02.

[5] Blanco-Cerradelo, L., Dieguez-Castrillon, M.I., Gueimonde-Canto, A., & Rodriguez-Lopez, N. (2022). Sustainable thermal tourism destination competitiveness: A multistakeholder perspective. *Journal of Tourism Analysis*, 29(1), 36-71. doi: 10.53596/jta.v29i1.383.

[6] Butkova, V.O. (2023). *Support for small business in Ukraine*. Retrieved from https://ndipzir.org.ua/wp-content/uploads/2019/17.05.19/17_05_2019-52-56.pdf

[7] DNEPROMET LLC. (2004). Retrieved from https://opendatabot.ua/c/32792404.

[8] E-robota. (2024). *E-robota: The government launches a system of grants for business development*. Retrieved from https://bip.net.ua/articles/erobota-uryad-zapuskaye-systemu-grantiv-dlya-rozvytku-biznesu/.

[9] Gherghina, Ş.C., Botezatu, M.A., Hosszu, A., & Simionescu, L.N. (2020). Small and medium-sized enterprises and economic resilience. *Sustainability*, 12(1), article number 347. doi: 10.3390/su12010347.

[10] Grotz, M., Crean, G., & Boever, E. (2019). *The data-driven innovation strategy for the development of a trusted and sustainable economy in Luxembourg*. Luxembourg: Ministry of the Economy.

[11] Hasanova, S. (2019). *Strengthening competitiveness of small and medium-sized enterprises and enhancing their integration into regional and global value chains in Kyrgyzstan*. Retrieved from https://www.unescap.org/sites/default/files/Strenghthening%20competitiveness%20of%20SMEs_final_English%20version_Savia.pdf.

[12] Innovative Technologies LLC. (2013). Retrieved from https://opendatabot.ua/c/38967445
[13] Karpenko, L., Izha, M., & Horokhovskyi, M. (2023). Instruments of state support for the development of small and medium-sized businesses in Ukraine in the conditions of the war state. *Public Management and Administration in Ukraine*, 33, 67-73. doi: 10.32782/pma2663-5240-2023.33.12.
[14] Krylovskyi, V. (2024). Increasing the financial potential of investment activity of business entities. *Economics, Entrepreneurship, Management*, 11(2), 65-76. doi: 10.56318/eem2024.02.065.
[15] Law of Ukraine No. 4618-VI "On the Development and State Support of Small and Medium-Sized Enterprises in Ukraine". (2012, January). Retrieved from https://zakon.rada.gov.ua/laws/show/4618-VI#Text.
[16] Lozynska, T.M., & Slichenko, V.V. (2022). State support for small business under martial law. *Public Management and Administration*, 4(78), 45-52. doi: 10.32840/1813-3401.2022.4.7.
[17] Lukashova, L.V. (2019). Small business: International dichotomies and innovation development strategies. *Economics and Business*, 1(106), 44-55.
[18] Lutska, N., Vlasenko, L., Ladanyuk, A., Zaiets, N., & Korobiichuk, I. (2022). Ontological support system of managerial decision-making of production tasks for a food enterprise. *Machinery & Energetics*, 13(3), 53-61. doi: 10.31548/machenergy.13(3).2022.53-61.
[19] Masson, N. (2024). *International business strategy: The ultimate guide for global success*. Retrieved from https://www.massoninternational.com/blog/international-business-strategy-the-ultimate-guide-for-global-success.
[20] Matsuzaki, T., Shigeno, H., Ueki, Y., & Tsuji, M. (2020). Innovation upgrading of local small and medium-sized enterprises and regional innovation policy: An empirical study. *Industrial Marketing Management*, 94, 128-136. doi: 10.1016/j.indmarman.2020.07.009.
[21] Melnyk, T.Y. (2022). State support and stimulation of business development in Ukraine during martial law. *Economics of Management and Administration*, 2(100), 3-11. doi: 10.26642/ema-2022-2(100)-3-11.
[22] Ministry of Economy of Ukraine. (2024). *Businesses, experts, donors, and regions will be involved in the development of the SME recovery strategy until 2027*. Retrieved from https://www.kmu.gov.ua/news/do-rozrobky-stratehiiu-vidnovlennia-msp-do-2027-roku-doluchat-biznes-ekspertiv-donoriv-ta-rehiony.
[23] PE "ECOAGRO PRO". (2024, August). Retrieved from https://opendatabot.ua/c/45545763.
[24] Potryvaieva, N., Dubinina, M., Cheban, Yu., Syrtseva, S., & Luhova, O. (2024). Digitalization of control and accounting processes of agricultural enterprises: Risk assessment and management. *Ekonomika APK*, 31(5), 45-58. doi: 10.32317/ekon.apk/5.2024.45.
[25] Sejdiu, Sh., Zeqiraj, V., & Nimani, A. (2024). Economic efficiency and finance in the development of the forest economy within the framework of legal restrictions. *Ukrainian Journal of Forest and Wood Science*, 15(2), 79-96. doi: 10.31548/forest/2.2024.79.
[26] Sirtori, E., Banfi, S., Canzian, G., Giffoni, F., Boschmans, K., Bilsen, V., Schito, M., Klimavičiūtė, L., Garnizova, E. (2024). *SMEs and open strategic autonomy*. Luxembourg: Publications Office of the European Union.
[27] Smentyna, N. (2022). Support of small and medium-sized enterprises at the level of territorial communities in the conditions of marital state. *Socio-Economic Research Bulletin*, 3-4(82-83), 81-94. doi: 10.33987/vsed.3-4(82-83).2022.81-94.
[28] State business support program "Affordable Loans 5-7-9". (2024, March). Retrieved from https://www.ukrinform.ua/rubric-economy/3836803-derzavna-programa-pidtrimki-biznesu-dostupni-krediti-579-u-posukah-optimalnogo-dizajnu.html.
[29] Strategy to Support SMEs in the Czech Republic 2021-2027. (2021). Prague: Ministry of Industry and Trade of the Czech Republic.
[30] Sudakov, M., & Lisogor, L. (2023). *Ukraine labour market monitoring report*. Kyiv: State Employment Service of Ukraine.
[31] Trusova, N.V., Cherniavska, T.A., Pasieka, S.R., Hranovska, V.H., Prystemskyi, O.S., & Demko, V.S. (2020). Innovative clustering of the region in the context of increasing competitive positions of the enterprises of the tourist-recreational destination. *Geojournal of Tourism and Geosites*, 31(3), 1126-1134. doi: 10.30892/gtg.31326-549.
[32] Ukrstat. (2022). *Number of employees of business entities by type of economic activity*. Retrieved from https://www.ukrstat.gov.ua/operativ/menu/menu_u/sze_20.htm.

Оптимізація стратегії державної підтримки малих та середніх підприємств на регіональному рівні за допомогою інвестиційно-інноваційних заходів

Марія Устименко
Аспірант
Львівський національний університет імені Івана Франка
79000, вул. Університетська, 1, Львів, Україна
https://orcid.org/0009-0008-9589-2713

Анотація. Метою цього дослідження була розробка оптимальної стратегії державної підтримки малих та середніх підприємств на регіональному рівні України через впровадження інноваційно-інвестиційних заходів, спрямованих на підвищення їх конкурентоспроможності та стійкості в умовах сучасних економічних викликів. Дослідження ґрунтувалося на аналізі ключових проблем, з якими стикалися малі та середні підприємства, таких як обмежений доступ до фінансових ресурсів, низький рівень впровадження інновацій, труднощі з інтеграцією на міжнародні ринки, а також недостатній рівень співпраці з науковими установами та державними органами. Аналіз охоплював три регіони України: Київську, Львівську та Дніпропетровську області. Основними результатами дослідження стали розробка рекомендацій для підвищення ефективності державної підтримки малих та середніх підприємств, яка мала враховувати регіональні особливості та потреби. Пропонувалося впровадження інноваційних кластерів для посилення співпраці між бізнесом, науковими установами та державними органами з метою створення інноваційних продуктів та послуг. Дослідження також підкреслило важливість цифровізації бізнесу, що дозволило б підвищити ефективність діяльності малих та середніх підприємств, знизити витрати та полегшити доступ до нових ринків. Окрему увагу було приділено необхідності залучення приватних інвестицій через механізми державно-приватного партнерства для фінансування інноваційних проектів, що сприяло б модернізації підприємств і збільшенню їх конкурентоспроможності як на національному, так і на міжнародному рівнях. Зокрема, впровадження інноваційних кластерів не лише стимулюватиме розвиток нових технологій, але й сприятиме обміну знаннями між підприємствами та науковими установами, що підвищить загальний рівень інноваційності в регіонах. Для цього необхідно створити сприятливе середовище для формування таких кластерів, включаючи фінансову підтримку, податкові пільги та програми навчання для підприємців. Важливим аспектом є також розвиток цифрових технологій, які здатні трансформувати бізнес-процеси в малих та середніх підприємствах

Ключові слова: економічна модернізація; підприємницька діяльність; фінансові інструменти; конкурентні переваги; капіталовкладення

Scientific Bulletin
of Mukachevo State University
Series
Economics

Volume 11, No. 4, 133-146
Journal homepage: https://economics-msu.com.ua/en

UDC 336.76(477):332.12(477)
DOI: 10.52566/msu-econ4.2024.133

Development of public regulatory strategies to incentivise investment in human capital

Murod Mukhammedov*
Doctor of Economics, Professor
Samarkand Institute of Economics and Services
140100, 9 Temur Str., Samarkand, Uzbekistan
https://orcid.org/000-0002-064B-198X
Akhtam Nizamov
PhD in Economics, Associate Professor
Samarkand State University
140104, 15 University Str., Samarkand, Uzbekistan
https://orcid.org/0000-0001-5348-6145
Zarina Mukhammedova
PhD in Economics, Associate Professor
Samarkand Institute of Economics and Services
140100, 9 Temur Str., Samarkand, Uzbekistan
https://orcid.org/0000-0002-2999-8068
Sarvar Iskhakova
PhD in Economics, Associate Professor
Samarkand Institute of Economics and Services
140100, 9 Temur Str., Samarkand, Uzbekistan
https://orcid.org/0000-0002-7371-1271
Akmal Nizamov
Master, Researcher
Samarkand Institute of Economics and Services
140100, 9 Temur Str., Samarkand, Uzbekistan
https://orcid.org/0009-0005-2746-6227

Received: 03.09.2024, Revised: 02.12.2024, Accepted: 27.12.2024

Suggested Citation: Mukhammedov, M., Nizamov, A., Mukhammedova, Z., Iskhakova, S., & Nizamov, A. (2024). Development of public regulatory strategies to incentivise investment in human capital. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 133-146. doi: 10.52566/msu-econ4.2024.133.

*Corresponding author

Abstract. The study aimed to identify the main problems and challenges in the process of development of strategies of state regulation to stimulate investment in human capital. A systematic methodology of analysis, including a comparative analysis of international experience and national approaches to state support and regulation of investment in human capital, was applied in the study. The three key areas were emphasised: educational, medical and migration programmes. The analysis was based on official statistical data of the Republic of Uzbekistan for 2019-2023, including indicators of life expectancy, education level, investment in health care and vocational training. The comparative assessment of data and practices was used to identify the strengths and weaknesses of Uzbekistan's state policy in the field of investment in human capital and formulate recommendations to improve its effectiveness. The results of the study demonstrate that the overall level of economic sustainability of the country depends significantly on the chosen strategy of state support for investment in human capital. The studied practice of state regulation of investment in human capital on the example of the Republic of Uzbekistan revealed that the successful development of such strategies depends on a comprehensive approach, which includes financing, coordination of various sectors of the economy and ensuring transparency in the implementation of programmes. The study results emphasised that a balanced combination of state regulation and private initiatives was required to stimulate investment in human capital. The key factors are sustainable legislative regulation, adaptation of modern management techniques and investment in long-term programmes aimed at developing the knowledge, skills, health and capabilities of the population

Keywords: improvement of living standards; financing of the education system; social protection of the population; health care and quality of life; migration policy; efficiency of budget expenditures

Introduction

Strategies for regulating investment in human capital from the government's perspective are a complex and multifaceted area of public policy that encompasses a wide range of activities and initiatives aimed at supporting education, health care, vocational training and other areas that can improve the level of human resources development. Stimulation of purposeful and continuous investment in improving the quality of the national human capital is one of the effective ways to achieve sustainable economic growth and increase the level of competitiveness in the global arena.

Modern global challenges, including pandemics, economic crises, rapid technological advances, and demographic changes, require prompt and thoughtful strategies from states to ensure long-term development, as policies to promote investment in human capital affect not only the level of economic stability but also social cohesion, growth in the quality of life and professional training of the labour force. For the state, investment in human capital is not just an expense but is seen as a profitable investment that can provide a return in the form of increased productivity, innovation and reduced social inequality (Novykova *et al.*, 2022). Thus, the need to develop effective strategies for state regulation in this sector is relevant for any country.

Studies conducted by Z.M. Dai *et al.* (2021) demonstrated that the use of advanced technologies for the economic growth of the country from the position of investment-oriented environmental regulators is closely related to the development of human capital. The authors emphasised that sustainable growth must address the thresholds of human capital efficiency level in the face of a changing external environment for sustainable growth to begin. A significant contribution to the analysis of the relationship that arises between such indicators as the quality of government regulation and implemented investments in human capital was made by S. Amoroso *et al.* (2024), who analysed the role of regulation and regional quality of governance in the development of high-growth enterprises, identifying in their study the need for a balance between the flexibility of public policy and the level of control over compliance with standards to stimulate the growth of productivity indicators. K. Vithana *et al.* (2021) addressed human capital in their article from the perspective of a strategic resource that can be represented as both an expenditure item and an investment asset. The provided results of their study show that the approach of the state regarding the regulation of investments in human resources from the position of considering it as a capital imposes its reflection on the development of the national economy.

H. Wang *et al.* (2023) noted the significant impact of governance features on the volume and efficiency of investment in all sectors, while the sustainability of governance, transparency and openness of the system are determining factors for attracting capital. C.C. Lee *et al.* (2022) analysed the impact of globalisation and government regulation on country risk and investment and argued that in the context of global change, the system of government regulation should address both external risks and internal mechanisms to stimulate investment in human capital. A study by P.E. Ofori *et al.* (2024) assessed the relationship between human capital development and institutional environment quality with inclusive growth, highlighting the importance of improving the skills of the labour force and public policies to ensure sustainable growth in any economy. P.E. Ofori *et al.* emphasised the importance of improving the quality of institutional conditions for the formation of a stable investment environment, in particular, they pointed out the need for an integrated approach, including training and stimulating educational programmes, to strengthen the position of human capital in the economy. H. Wang *et al.* (2023) noted that the attraction of finance in

public-private partnerships directly depends on the characteristics of governance, transparency of procedures and the ability of the state to build long-term strategies aimed at improving the level of human capital.

In general, the sources reviewed form an idea of the problems of developing state strategies aimed at stimulating investment in human capital and emphasise the importance of adapting existing regulatory measures to improve the sustainability of the economy. The study aimed to identify specific problems and challenges arising in the process of developing strategies of state regulation of stimulating investment in human capital based on the experience of the Republic of Uzbekistan. Objectives of the study were to:

1. Analyse how the policy chosen by the Government of Uzbekistan affects the creation and development of human capital in the country.

2. Assess the effectiveness of existing state regulatory instruments to stimulate investment in human capital.

3. Develop recommendations for optimising legislation and regulatory strategies, considering international experience and the specifics of the Uzbek economy.

Materials and Methods

This study is an assessment of state regulation strategies to stimulate investment in human capital in the Republic of Uzbekistan. Special economic research methods were applied, addressing a specific function in the process of analysis: statistical method was used to process data on life expectancy, level of education, public investments in health care and education, coefficient method was used to calculate the ratio of incomes of different population groups and the share of social spending, trend method was used to track changes in key indicators for the study period 2019-2023, comparative analysis was used to compare the results of the Republic of Uzbekistan with indicators of human capital development in other countries (Republic of South Korea, the Republic of Uzbekistan, Japan, Finland), the economic and legal method was used to study the regulatory framework, including laws and policies governing the development of education and healthcare.

The study was based on the analysis of the legal and regulatory framework of the Republic of Uzbekistan, including key legislative acts, such as the Law of the Republic of Uzbekistan "On Education" (2020), which defines the legal and organizational framework of the education system, including the principles of financing educational programmes, mechanisms for their implementation, as well as the rights and obligations of all participants in the educational process, and its provisions serve as a basis for assessing the effectiveness of government measures to develop human capital. This law establishes the basic directions of state policy in the educational sphere and is a key document in assessing the impact of regulatory measures on the development of human capital. The study also analysed the provisions of Decree No. DP-5590 of the President of the Republic of Uzbekistan "On Complex Measures on the Radical Improvement of the Health-Care System of the Republic of Uzbekistan" (2018), which defines measures to improve the health infrastructure, improve the qualifications of health workers and ensure accessibility of medical services. The relevance of the assessment of this document was determined by the health care system being an integral part of human capital and directly affecting the level of public welfare and labour productivity. For a broader understanding of the state regulation of this sector, the decrees and resolutions signed by the President and the Cabinet of Ministers of Uzbekistan were studied, including Decree No. DP-5590, as well as the "Strategy of Uzbekistan 2030" (2022), which aims to support employment, professional training and retraining, and the development of the social sphere. To identify the impact of legislative measures on actual investment indicators, official statistical data presented on the statistics website of the researched country for 2019-2023 were used in the context of key indicators such as life expectancy of the population, education level, investment in the health care system (Statistics Agency..., 2024).

In addition to national statistics, reports from the Ministry of Employment and Labour Relations and the Ministry of Economy and Finance were used, in particular, information on the distribution of funds to support professional educational programmes and the implementation of social projects was examined. Statistical analyses were conducted to identify changes in the volume of funding and their relationship with indicators of the quality of human capital, such as the level of educational attainment and the availability of medical services.

Results

One of the key challenges of globalisation for each country is the creation of a new economy, which is based on the knowledge and skills of the population, depending on the availability and quality of educational and health services, achievements in science, technology and information, i.e. the success of economic development depends directly on the level of human capital development, because this type of capital is an important factor in shaping the level of competitiveness of the country, affecting the dynamics of its economic performance (Chakrabarti *et al.*, 2020). A review of the history of the success of developed economies demonstrates that the highest performance in terms of human capital development was achieved by those countries where the government developed and implemented effective instruments of state regulation to attract investment in human capital while establishing effective inter-agency coordination. In the Republic of South Korea, the strategy of rural modernisation through the Saemaul Undong programme has significantly reduced poverty and raised educational standards in rural areas. The programme aimed to improve the self-awareness and skills of the rural population through investment in training and infrastructure, resulting in accelerated urbanisation and economic growth (Liao *et al.*, 2024). Singapore has an innovative vocational training model based on the SkillsFuture programme. The initiative reaches out to all age groups by providing

citizens with access to skills development courses and retraining programmes to adapt to rapidly changing labour market demands, and the success of the programme has been exemplified by an increase in the proportion of skilled workers and growth in the IT and engineering industries (Ni *et al.*, 2023).

In Japan, the combination of educational reforms with a national innovation strategy was a key element of public policy, with technology adoption and university research support fostering the creation of high-tech clusters such as biotechnology and robotics, establishing the country as a leader in science and innovation (Amoroso *et al.*, 2024). Finland, on the other hand, emphasises equal access to education from pre-school to university level. A free education system and training programmes adapted to the needs of the labour market provide the skills needed for high-tech industries, making Finland one of the countries with the highest levels of human capital in the world (Cheah & Ho, 2019). These examples confirm that a systemic approach involving a combination of public investment, vocational education and innovation plays a crucial role in the successful development of human capital, and the experience of these countries can be adapted to the conditions of the Republic of Uzbekistan to create similar programmes that stimulate the growth of human capital.

The experience of developed countries that have been studied on this issue emphasises that optimal transformation of the economic system is possible only when the main focus is on reforming investments in human capital and innovation, whereby the constituent elements of human capital should be defined as health, knowledge, technology and information systems that allow for higher levels of productivity and efficiency at the corporate, national and global levels. Personnel with a high level of qualification is a strategic advantage and often allows them to achieve the goals of an individual farm or society. The concept of "human capital" has such a name because it is created in the process of purposeful investment in people, in their education, qualification training, health, social and other needs (Kalyuzhna *et al.*, 2024).

Investments acquire special importance in modern conditions as a key prerequisite for the existence, formation and evolution of human capital, as it is the person who possesses such capital that acts both as an object and a subject, as well as the result of the invested impact. Investments in human capital are usually defined as the expenditure of money and other resources on education, upbringing, health care, research and development, and culture, because all this is aimed at improving the productive abilities, qualifications and intellectual potential of an individual, and such investments are designed for long-term return, which is manifested in the growth of income in future periods and a positive impact on the economic development of the country (Ismayilov & Karimova, 2023).

Investment sources of human capital include individual families, enterprises, private and public foundations, and international organisations. The selected course of development of the Republic of Uzbekistan defines one of its main directions as improving the quality of life of the population. Over the years of independence, positive changes were noted in several demographic indicators, in particular, the mortality rate has decreased, and life expectancy has increased, which emphasises the increasing prosperity of the population. However, the Government is aware that further development of human capital is needed, as there are several unresolved social issues and the economy is facing difficulties and constraints due to the low quality of human capital, as its existing potential is not sufficient to meet the needs of the population (Liao *et al.*, 2024). One of the indicators to assess the state of human capital is the income ratio: the top 10% of the wealthiest and the bottom 10% of citizens (Cao & Rees, 2020). In the country under consideration, this indicator is 7%, which indicates the effectiveness of government policy in the social sphere (Fig. 1).

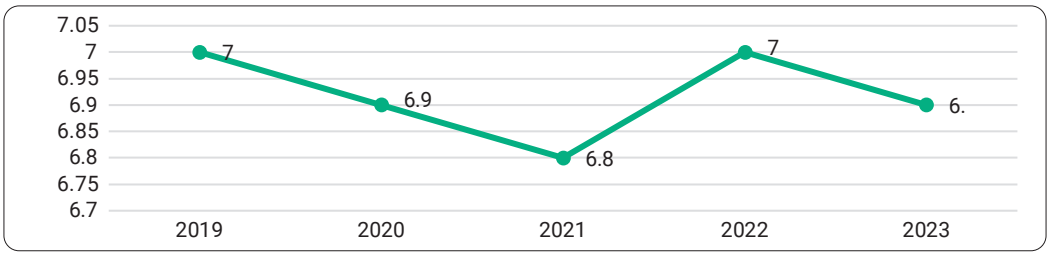

Figure 1. Income distribution ratio by 10 percentage groups of the population of the Republic of Uzbekistan in 2019-2023

Source: compiled by the authors based on the Statistics Agency under the President of the Republic of Uzbekistan: Demography (2024)

The instruments of state regulation of investment in human capital in the Republic of Uzbekistan aim to increase the level of qualification of the population and improve the quality of life and competitiveness at the global level. For this purpose, the country is actively developing and implementing strategies that support the system of education, health care, employment, social protection, and migration processes. The fundamental document in this direction is the "Strategy of Uzbekistan 2030" (2022), which views human capital as one of the key components that make up sustainable socio-economic development (Table 1).

Table 1. Priority areas of the development strategy of the Republic of Uzbekistan until 2030 oriented towards the development of human capital

Priority area	Description	Expected results
Improvement of the quality of education	Improvement of the education system, expanding access to quality educational resources, and developing professional skills and competencies.	Increase in the number of qualified personnel, reduction of youth unemployment, and training of specialists for high-tech industries.
Improved healthcare	A developed healthcare system, affordable and high-quality medical services, and a focus on preventive care and people's health.	Increased life expectancy and quality of life, increased labour productivity, and improved demographic indicators.
Development of the employment system	New jobs, the development of small and medium-sized businesses, as well as training and retraining will help to increase employment.	Reduction of unemployment, growth of economic activity, and improvement of the material well-being of citizens.
Social protection and support of the population	Expansion of the social protection system, increasing support for vulnerable groups, improving pensions and social assistance.	Increase in social stability, reduction of poverty, improving the quality of life of citizens, and strengthening social justice.
Attraction of private and foreign investment	Creation of conditions for stimulating domestic and foreign investment in human capital, and modernisation of the economy through partnerships with businesses.	Increase in the level and volume of investments in healthcare and education, modernisation of infrastructure, and increase in economic productivity.
Digitalisation and innovative development	Implementation of digital technologies and innovations in governance and economy, improvement of digital literacy and use of IT in education and healthcare.	Improvement of the efficiency of public administration, access to new technologies, and the development of digital infrastructure in education and healthcare.

Source: compiled by the authors based on Decree No. DP-5590 (2018), Law of the Republic of Uzbekistan "On Education" (2020) and "Strategy of Uzbekistan 2030" (2022)

Thus, investment in human capital development is essential for the dynamics of Uzbekistan's economic performance, social stability and increasing national competitiveness, with the main areas of such investments being sectors with a long-term effect on productivity growth, innovation potential and sustainable development – health care, education, employment, migration processes and social development. The education sector is one of the priority areas of investment in human capital, as education contributes to the formation of knowledge and skills necessary for innovation and technological progress, while the higher the level of education of citizens, the higher the level of their readiness to work in high-tech and knowledge-intensive industries, which also increases the potential for creating a highly skilled labour force (Peng *et al.*, 2020).

The Government of Uzbekistan is developing various mechanisms and tools to promote educational reform and modernisation, including revising existing curricula, improving conditions for students, introducing more modern learning technologies and tools, and upgrading the qualifications of teaching staff. Reforms in Uzbekistan's education system aim to develop critical thinking, creativity and practical skills among students, and an important role in this process is the renewal of vocational education to enable the training of specialists capable of meeting the requirements of the modern economy (Decree No. DP-5847, 2019).

To realise these objectives, the Government is actively cooperating with international partners and engaging foreign experts to adapt best educational practices to the national specificities, and among the significant results of the reforms is an increase in preschool enrolment: from 27.7% in 2016 to 71.8% in 2022 and 74% in 2023. Similar changes are observed in higher education: enrolment increased from 9% in 2016 to 42% in 2023, and the number of schools increased markedly over this period, from 9,719 to 10,750 and higher education institutions from 77 to 212, confirming the positive changes in Uzbekistan's education system (Lombardozzi, 2023). Figure 2 shows the average duration of education in the Republic of Uzbekistan.

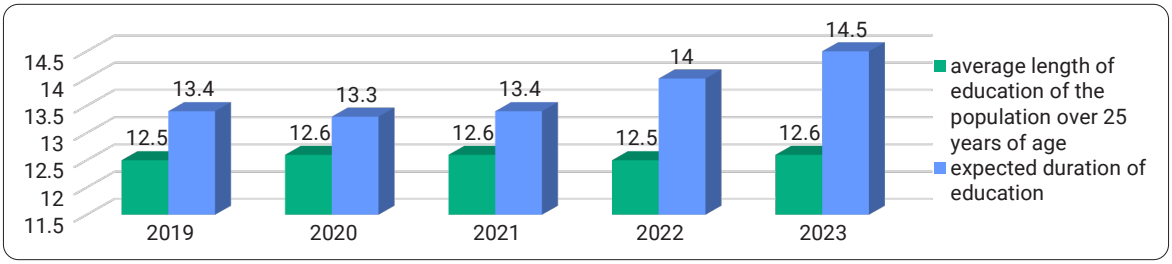

Figure 2. Dynamics of the average duration of education of the population over 25 years old in the Republic of Uzbekistan in 2019-2023

Source: compiled by the authors based on and Law of the Republic of Uzbekistan (2020) and the Statistics Agency under the President of the Republic of Uzbekistan: Demography (2024)

In 2023, the average duration of education in Uzbekistan reached 14.6 years, with 14.4 years for males and 14.8 years for females, which is higher than in 2019, when this criterion was 12.5 years, with males studying for an average of 12.9 years and females for 12.5 years. These indicators show that educational opportunities have increased significantly in recent years while contributing to the improvement of skills and competitiveness of the population.

In Uzbekistan, the creation and development of new higher education institutions and the establishment of branches of international universities are emphasised, helping to integrate the Uzbek educational system into the global educational space. Many of the new higher education institutions are based on the principles of public-private partnership, which attracts investment and improves the quality of educational programmes. Educational reforms have restored part-time and evening forms of education and increased admission quotas to higher education institutions, making it possible to increase the enrolment of school leavers in higher education from 9% in 2016 to 37% in 2023 (Amoroso *et al.*, 2024). To improve the interrelation between the different levels of education and training of specialists, the Ministry of National Education has integrated academic lyceums and technical schools with higher education institutions and relevant sectoral enterprises, as a result of which 65 academic lyceums are now part of higher education institutions and 187 technical schools are affiliated with related higher education institutions and enterprises, which ensures closer cooperation and integration of educational programmes. The comprehensive approach taken aims to build a strong system of vocational and higher education that can respond effectively to the challenges of the modern economy (Damasceno & Guedes, 2024). The number of higher education institutions in the Republic of Uzbekistan is presented in Figure 3.

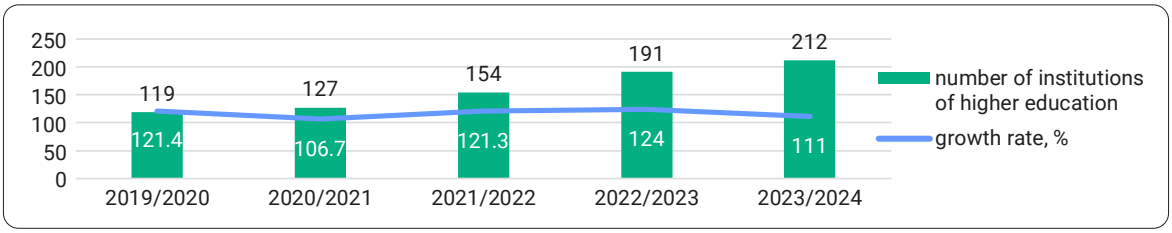

Figure 3. Dynamics of the number of higher education institutions in the Republic of Uzbekistan
Source: compiled by the authors based on SIAT: Number of emigrants (2024)

Thus, various areas of investment in the education sector are integral elements of investment in human capital and require significant time and money expenditures. In addition to education, an important area of investment in human capital is the health care system, investments which are defined as covering the costs of disease prevention, medical care, and improvement of nutrition and living conditions. Financing this sector contributes to the reduction of morbidity and mortality rates, thus increasing the active life span of citizens and improving the efficiency of human capital throughout its life cycle (Vithana *et al.*, 2021). Health can be viewed as a special natural resource of a person, as some of it is passed on genetically and others are formed through personal efforts and support of society, while over time human capital naturally wears out due to the ageing of the body, but investments in health care help slow down this process, which benefits both individuals and society. The promotion of healthy lifestyles and access to quality healthcare improves the physical and mental well-being of the population, increasing performance and productivity (Dankyi *et al.*, 2022).

Maintenance of public health at an appropriate level is one of the priorities of state policy of any developed economy, as the future of the country directly depends on it. The level of attention of the state to the health sector is primarily reflected in the amount of budget expenditure on this sphere, as financing of health care allows for the development of infrastructure and provision of affordable medical services. The main source of funding for the health care system of the Republic of Uzbekistan is the country's budget (Fig. 4).

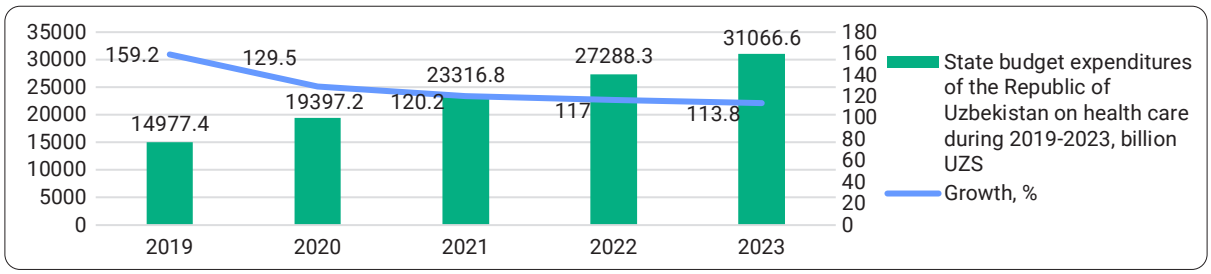

Figure 4. State budget expenditures on healthcare in the Republic of Uzbekistan in 2019-2023
Source: compiled by the authors based on the Statistics Agency under the President of the Republic of Uzbekistan: Demography (2024)

Based on the data presented, it is evident that health expenditures in Uzbekistan have steadily increased over the past five years, reaching 31,066.6 billion soums by 2023. Investments in preventive medicine and improved access to health care have a direct impact on labour productivity: healthy employees take fewer sick days and work more efficiently, demonstrating that investments in disease prevention help reduce treatment costs and contribute to increased life expectancy and improved quality of life. A statistical criterion that affects the period of labour activity of an individual is life expectancy (Fig. 5).

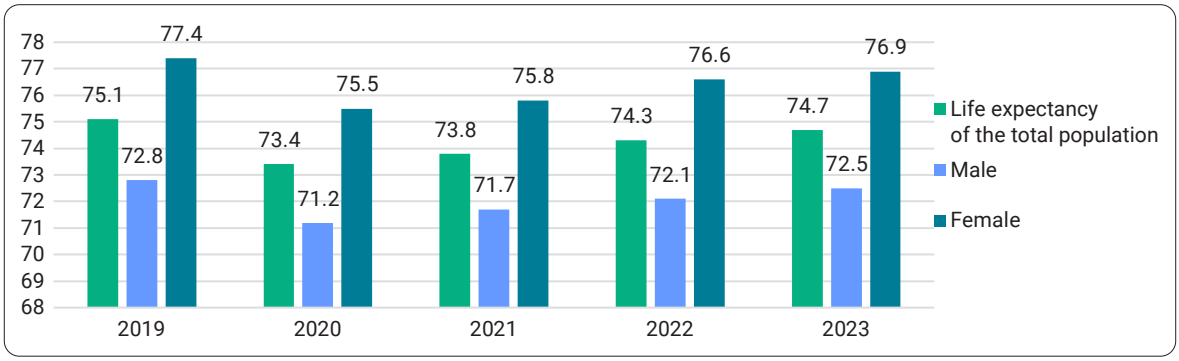

Figure 5. Life expectancy of the population of Uzbekistan, years
Source: compiled by the authors based on SIAT: Number of emigrants (2024)

Health as a key aspect of life necessitates investment in long-term improvement of its quality and duration. Up to 2020, life expectancy in the Republic of Uzbekistan showed positive dynamics, but the COVID-19 pandemic led to an increase in premature deaths, which caused a decline in this criterion, nevertheless, starting in 2021, life expectancy in the country began to increase again, reaching 74.7 years in 2023, which reflects the effectiveness of measures aimed at the rehabilitation and development of the health system. In comparison, developed countries such as Japan and Switzerland have a life expectancy of more than 84 years, due to high investment in medicine, disease prevention and the creation of conditions to maintain an active and healthy lifestyle (Gao *et al.*, 2024). The world's leading countries emphasise preventive medicine as it significantly reduces treatment costs and maintains the quality of life of the population at a high level. In countries with such health indicators, the level of human capital is also significantly higher, as people remain capable of labour and active longer. Consequently, the state of health of citizens can be not only a reflection of the level of social development of a country but also a factor affecting its economic growth. The health of the population is directly related to labour productivity, as healthy people are less susceptible to disease and can remain in the labour force longer (Ravshanov *et al.*, 2024). Therefore, investment in the health care system is an important part of the economic strategy, as supporting the health of the nation leads to the growth of the general welfare and stability of the state.

Migration and job search investments are another area of investment in human capital, as they increase the economic potential of employees by increasing mobility and the market value of their labour services, with the investment taking the form of the costs of moving and adjusting to a new, higher productivity region where workers can access better working conditions and higher wages (Ismayil-Zada, 2023). This type of investment is similar to investment in education in that both involve time and financial costs, the returns of which are realised over time. The costs associated with both migration and job search represent one of the least apparent forms of human capital investment, as they ensure the future flow of labour services, increasing the economic value of the worker in the new location (Damasceno & Guedes, 2024). In addition, migration enhances the mobility of the labour force, enabling a quick response to changes in demand in high-performing sectors where skilled labour is required, while as information on job vacancies and wage levels, as well as on social and economic conditions in other regions becomes more readily available, such investments enable migrants to find the most advantageous offers, thereby increasing their economic returns (Nicolás-Salas & Lorente, 2024).

Labour migration has a significant impact on the labour market of the Republic of Uzbekistan, as a significant part of the labour force leaves the country in search of higher wages and stable working conditions, which has a twofold effect: on the one hand, the inflow of money from abroad contributes to maintaining the income of migrants' families and the growth of the national economy as a whole, and on the other hand, the departure of highly qualified specialists creates a threat of loss of important human capital, which negatively affects the opportunities for development within the country. Figure 6 shows the dynamics of migration of citizens from Uzbekistan by month from 2019 to 2023.

The number of people travelling abroad from Uzbekistan has varied considerably from period to period, for instance in 2019 and 2021 the number of migrants remained relatively stable throughout the year with slight fluctuations, but in 2022 and 2023 there was a marked increase in the number of people leaving in summer and autumn, with a sharp decline towards the end of the year, peaking in August-September 2022 when the number of migrants

reached a peak of almost 4,800, in 2023 there is also a significant increase in summer, although the peak is lower compared to 2022. Such seasonal dynamics are associated with temporary labour migrations timed to coincide with the agricultural or construction season when the demand for labour abroad is higher; in addition, year-to-year differences in migration rates may be due to economic and political changes, as well as the effects of the pandemic, which affected people's mobility and employment opportunities in other countries.

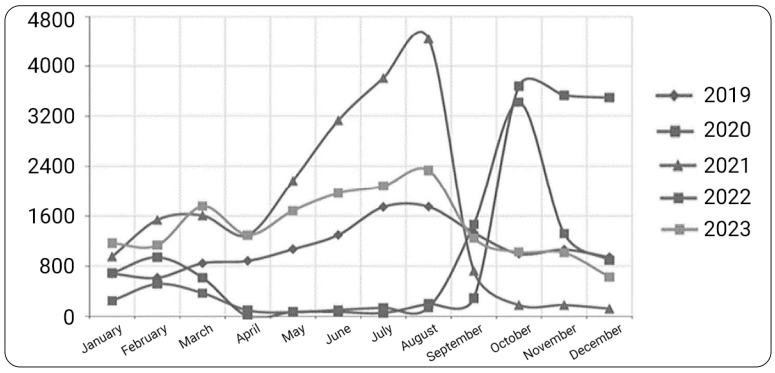

Figure 6. Number of labour migrants from the Republic of Uzbekistan to other countries, people
Source: Statistics Agency under the President of the Republic of Uzbekistan: Demography (2024)

Strategic investments in human capital are essential for national sustainable economic growth and competitiveness, which require time to implement but provide lasting and meaningful economic benefits (Ponomarenko & Pysarchuk, 2024). However, the nature and structure of investments depend on the national, cultural and historical characteristics of the country. Investments in human capital, such as educational programmes, health care and migration programmes, provide significant social, economic and psychological benefits, despite the difficulty of quantifying them, and the expected results of such investments include an increase in the level of income of the population, growth in labour productivity, increased competitiveness of the national economy and, as a result, an increase in gross domestic product (Cotula, 2020). The dynamics of the aggregate income of the population of the Republic of Uzbekistan are presented in Table 2.

The information presented in the table demonstrates a positive and stable growth in the aggregate income of the population of the Republic of Uzbekistan in both nominal and real terms. Changes in the national economic development are reflected in the dynamics of GDP (Fig. 7).

Table 2. Dynamics of total household income in 2019-2023

Metric	2019	2020	2021	2022	2023
Total household income, billion UZS	365598.3	414968.7	519181.4	633567.4	728826.1
The volume of total income per capita, thsnd. UZS	10887.3	12122.2	14869.8	17772.8	20015.9
The volume of real aggregate income, billion UZS	319216.2	367456.6	468448.4	568527.8	662749.9
The volume of real aggregate income per capita, thsnd. UZS	9506	10734.3	13416.8	15948.3	18201.2
The growth rate of real income of the population, %	106.2	100.5	112.9	109.5	104.6

Source: compiled by the authors based on the Statistics Agency under the President of the Republic of Uzbekistan: Demography (2024)

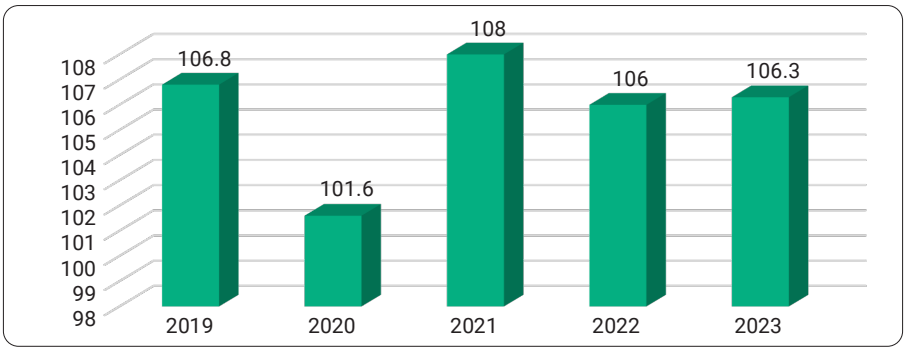

Figure 7. GDP dynamics of the Republic of Uzbekistan during 2019-2023, %
Source: compiled by the authors based on SIAT: Number of emigrants (2024)

The GDP of Uzbekistan was growing during this period, peaking in 2021 and declining in 2020 due to the lockdown caused by the coronavirus pandemic. Thus, investments in human capital development became key for long-term economic growth, benefiting both individuals and the country. These include spending on health, education, employment support, social protection and other areas that contribute to human capital development. To develop strategies of state regulation aimed at stimulating investment in human capital, the following measures are proposed:

1. Investments in priority educational programmes, i.e. implementation of targeted government programmes for training in key sectors such as information technology, engineering, medicine, and biotechnology, require the development of a grant programme for students in these areas with a guarantee of employment, creation of a national network of vocational training centres, which will ensure the training of qualified specialists, especially in in-demand technical specialities, and increase adaptivity of workforce to market demands.

2. The creation of a system of tax incentives for companies investing in human capital, for instance, tax deductions of up to 20-30% of employee training costs can increase the interest of employers in the long-term development of their human resources.

3. The introduction of a state basic health insurance programme will improve access to healthcare and reduce the financial burden on households while funding for preventive medicine and promoting healthy lifestyles will create conditions for improving the health of the population, which in turn will have a positive impact on overall productivity.

4. Creation of innovation and technology clusters such as technological parks and innovation centres by providing tax incentives to companies involved in research and development.

5. Introduction of a system for monitoring and evaluating the effectiveness of investments in human capital, defining clear performance indicators, such as the employment rate of graduates, the share of qualified personnel in strategic sectors and population health indicators, which can enable analysis and adjustment of the effectiveness of investments in human capital.

6. Support for internal labour mobility to ensure an even distribution of skilled professionals across the country, requires an introduction of housing subsidies and special loans for workers moving to regions with high labour demand. Rotation programmes for workers in the public sector would also help to spread experience and skills across regions, which would help to reduce inequalities in labour opportunities.

The proposed measures will stimulate investment in the human capital of the Republic of Uzbekistan, create the basis for sustainable economic growth in the country and overcome existing challenges, including the shortage of qualified personnel and labour outflow, which will positively impact the national competitiveness in the global market.

Discussion

The results of the study confirm that the development and implementation of state regulation strategies to stimulate investment in human capital has a positive impact on economic growth and development of society. The application of tax incentives and other financial incentives activate investment in education and health, which according to the study by N.H. Nik Abdullah *et al.* (2022), contributes to the strengthening of human capital as a strategic resource that enhances the competitiveness of the country. The same conclusions were reached by A.A. Al-Tit *et al.* (2022), who emphasised the importance of developmental practices in enhancing social and human capital and noted that government support contributes to the growth of skills and social and economic inclusion.

I. Alami & A.D. Dixon (2019) confirmed that state regulation in the form of human capital development programmes can help reduce social inequality and improve economic potential through support for education and medicine, which is particularly relevant for the Republic of Uzbekistan, where economic and social realities require an adapted approach to modernizing the system of support for education and health care, which is confirmed by the findings on the positive impact of investment in human capital on economic growth in developing countries. One of the conclusions of the study states that to successfully stimulate investment in human capital, government strategies should incorporate the specifics of national and regional characteristics, while the integration of the best international practices adapted to Uzbek realities, as noted by S. Amoroso *et al.* (2024), can be used by government agencies to implement effective reforms that contribute to human capital growth and economic development.

The results of the study also show that stimulating investment in human capital at the level of public policy can not only increase the educational level of the population but also contribute to social stability and sustainable economic development, which was also noted by M. Fischer-Daly (2019), who also specified that the lack of effective control over the observance of international labour rights can hinder the attraction of investment, which is especially relevant for countries in transition, such as the Republic of Uzbekistan The author emphasised the importance of clear state mechanisms that support the equitable distribution of resources and rights. In this context, state regulation can strengthen national position at the international level, which is consistent with the findings of C.C. Lee *et al.* (2022) on strengthening the economic resilience of countries in the context of globalisation.

The state support of human capital is also related to increasing the availability and quality of educational programmes, which is confirmed by D. Gándara & A. Rutherford (2020), who argue that university funding programmes improve the accessibility of higher education, although occasionally at the expense of other priorities, such as equal access to education, which challenges the effectiveness of such strategies. Similarly, J. Gao *et al.* (2024) highlighted

the importance of training and human capital mobility to improve competitiveness but noted that the difficulty of transferring skills across sectors can make it difficult for workers to move into more innovative occupations. These tensions emphasise that investment in human capital requires a balanced approach that considers the balance between market needs and the interests of individual workers.

At the same time, not all authors are unanimous in assessing the positive impact of state intervention. For instance, R. Klingler-Vidra & Y. Liu (2020) emphasise that an over-reliance on inclusive innovation policies can cause a concentration of resources in certain sectors, which, while contributing to social capital, can reduce the effectiveness of investments in other key areas. Such an issue is particularly relevant for the Republic of Uzbekistan, where, as noted by L. Lombardozzi (2023), the structure of state capitalism and historical factors can influence the allocation of resources and slow down structural transformation.

The discussion of the research results in the context of the impact of government regulation on stimulating investment in human capital reveals a range of both agreed and contradictory views among researchers. L. Ni *et al.* (2023) highlight the importance of regulation related to environmental aspects and the development of green human capital, which they consider important for sustainable economic growth. The researchers stress that such an approach can become a significant factor for industrial modernisation and innovative development, especially in conditions of active human capital growth, although the success of such initiatives depends on the state's ability to balance environmental and economic priorities.

K.K. Nurasheva *et al.* (2024) addressed capital attraction and investment attractiveness in Central Asia and emphasised that the regional appeal to investors often depends on the level of human capital as well as the stability and transparency of government policies. In contrast to these findings, P.E. Ofori *et al.* (2024) demonstrated that in African countries, the insufficient quality of the institutional environment can weaken the positive effects of human capital investments. Thus, these findings highlight the complex relationship between institutional quality and the performance of human capital incentive policies. The results confirm the need to consider both the level of human capital and the effectiveness of public institutions in attracting investment and suggest that in Uzbekistan, the combination of educational and social reforms and increased transparency in public policy can ensure sustainable economic growth (Mukhammedov & Murodov, 2021) while minimising the risks associated with countries with less developed institutional environments.

The findings also demonstrate the importance of a balanced approach to human capital investment as, for instance, H. Peng *et al.* (2020), highlighted the possible negative effect of financial constraints on long-term investment in innovation, which is relevant for emerging economies where limited resources force a prioritisation that often creates contradictions in the implementation of long-term strategies. Thus, this study shows that while investment in human capital is an important aspect of public policy, its effectiveness depends on a variety of factors, including the quality of the institutional environment and the balance of government support.

Among other studies, there is also a discrepancy in the effectiveness of government regulation to incentivise investment in human capital. T.H. Thien & N.X. Hung (2023) emphasised the importance of strategic management practices to improve the performance of investment in intellectual capital, which is one of the most important components of human capital. They argued that the use of strategic accounting can significantly improve the return on investment, but this requires high-quality infrastructure and supportive conditions from the government. This view correlates with the study by D.V. Tran *et al.* (2024), which highlighted the importance of social capital and government support in enhancing the dynamic capabilities of enterprises. According to the researchers, the combination of open innovation and government support can enhance competitiveness, especially in resource-constrained environments. The results obtained in the study confirmed these conclusions, in particular, the analysis of the national programmes of the Republic of Uzbekistan has demonstrated that the introduction of targeted educational initiatives and the stimulation of investment in health care, backed by state support, significantly increase key indicators of human capital, for instance, the increase in enrolment in higher education in recent years indicates the effectiveness of programmes to modernise the education system. Furthermore, increased public funding for health care has had a positive impact on life expectancy, which reached 74.7 years by 2023.

Conversely, T.P. Schultz (2010) expressed scepticism regarding the universality of such measures and argues that investments in human capital should be consistent with the realities of the economy, and excessive regulation, which limits market flexibility, can hinder innovation and reduce the overall effect of investment in the long term. The author argues that health and education are key human capital factors that require long-term investment, but their return on investment often depends on less regulation and an open economic climate that allows innovation to develop freely. Thus, the research discussed here shows disagreement between approaches to regulating and incentivising investment in human capital. While some scholars see strict government controls as a way to improve investment performance, others emphasise the importance of flexibility and adaptability of regulation to market conditions.

Conclusions

The results of the study confirm that the strategy of state regulation aimed at stimulating investment in human capital is a key factor in ensuring sustainable economic growth and improving social welfare. The analysis of modern approaches to state regulation has shown that the use of various instruments, such as tax incentives, subsidies for

educational and medical institutions, and support for vocational training and educational programmes, contributes to the active attraction of investment in human capital development. The study determined that these measures not only contribute to the growth of the qualification level of the labour force, but also motivate the population to participate in educational processes and master new professional competencies, for instance, the higher education enrolment rate in the Republic of Uzbekistan increased from 9% in 2016 to 42% in 2023, and the number of higher education institutions increased from 77 to 212 during this period.

A key aspect of stimulating investment is support for government programmes in health care and disease prevention, which contributes to improving the health of the population and reducing future healthcare costs, in the Republic of Uzbekistan budget expenditures on health care have increased almost 3.5 times over the past five years, reaching 31,066.6 billion UZS in 2023. Investments in the health of citizens, in turn, directly correlate with the productivity of the labour force and the national investment capacity, which contributes to the strengthening of human capital as the most important resource of the modern economy, life expectancy in the Republic of Uzbekistan, despite a temporary decline in 2020 due to the pandemic, has increased to 74.7 years in 2023, indicating the recovery and development of the health care system.

Additionally, the study determined that a comprehensive approach combining financial and educational support measures prevents the brain drain and increases the internal mobility of labour resources. Such measures can also be used to optimise the distribution of the labour force across industries, which has a positive impact on productivity growth and competitiveness of the economy. In particular, the creation of conditions for the development of vocational education in the regions, support of state retraining programmes and provision of targeted grants for students ready to work in strategically important industries strengthen the national human resource base. In addition, such initiatives stimulate the development of innovative sectors of the economy and create opportunities for long-term sustainable growth, for instance, preschool enrolment increased from 27.7% in 2016 to 74% in 2023, highlighting the positive changes in the training of skilled personnel from the earliest stage of development. It is also worth noting that continuous monitoring and flexibility in implementation are required to improve the effectiveness of these strategies. The adaptation of international regulatory experience to the specificities of the national economy will enhance the sustainability of ongoing reforms and improve their impact. The main recommendation is that the state should thoroughly research and adopt the best international practices in this area, applying them to the economic and social realities of the Republic of Uzbekistan.

Prospects for further research include a more in-depth analysis of investment efficiency, based on sectoral, regional and age characteristics, as well as a detailed study of the interaction of human capital with digitalisation and innovation. Of particular interest is the study of the mechanisms of adaptation of educational and social systems to changes in global labour markets, which will broaden the understanding of the role of human capital as a driver of sustainable economic growth.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Alami, I., & Dixon, A.D. (2019). State capitalism(s) redux? Theories, tensions, controversies. *Competition & Change*, 24(1), 70-94. doi: 10.1177/1024529419881949.

[2] Al-Tit, A.A., Al-Ayed, S., Alhammadi, A., Hunitie, M., Alsarayreh, A., & Albassam, W. (2022). The impact of employee development practices on human capital and social capital: The mediating contribution of knowledge management. *Journal of Open Innovation Technology Market and Complexity*, 8(4), article number 218. doi: 10.3390/joitmc8040218.

[3] Amoroso, S., Herrmann, B., & Kritikos, A.S. (2024). The role of regulation and regional government quality for high-growth firms: The good, the bad and the ugly. *Regional Studies*, 58(9), 1710-1727. doi: 10.1080/00343404.2024.2366289.

[4] Cao, Z., & Rees, W. (2020). Do employee-friendly firms invest more efficiently? Evidence from labor investment efficiency. *Journal of Corporate Finance*, 65, article number 101744. doi: 10.1016/j.jcorpfin.2020.101744.

[5] Chakrabarti, R., Gorton, N., & Lovenheim, M. (2020). State investment in higher education: Effects on human capital formation, student debt, and long-term financial outcomes of students. *CESifo Working Paper No. 8592*. doi: 10.2139/ssrn.3710347.

[6] Cheah, S.L.-Y., & Ho, Y.-P. (2019). Effective industrial policy implementation for open innovation: The role of government resources and capabilities. *Technological Forecasting and Social Change*, 151, article number 119845. doi: 10.1016/j.techfore.2019.119845.

[7] Cotula, L. (2020). (Dis)integration in global resource governance: Extractivism, human rights, and investment treaties. *Journal of International Economic Law*, 23(2), 431-454. doi: 10.1093/jiel/jgaa003.

[8] Dai, Z.M., Shen, X., & Guo, L. (2021). Technological innovation on economic growth from the perspective of investment-oriented environmental regulations: Considering the threshold effect of China human capital. *Applied Economics*, 53(40), 4632-4645. doi: 10.1080/00036846.2021.1904128.

[9] Damasceno, A.O., & Guedes, D.R. (2024). Financial openness, capital accumulation, and productivity in emerging and developing economies. *Economic Modelling*, 133, article number 106663. doi: 10.1016/j.econmod.2024.106663.
[10] Dankyi, A.B., Abban, O.J., Yusheng, K., & Coulibaly, T.P. (2022). Human capital, foreign direct investment, and economic growth: Evidence from ECOWAS in a decomposed income level panel. *Environmental Challenges*, 9, article number 100602. doi: 10.1016/j.envc.2022.100602.
[11] Decree No. DP-5590 of the President of the Republic of Uzbekistan "On Complex Measures on the Radical Improvement of the Health-Care System of the Republic of Uzbekistan". (2018, December). Retrieved from https://lex.uz/ru/docs/6967946.
[12] Decree No. DP-5847 of the President of the Republic of Uzbekistan "On Approval of the Concept for the Development of the Higher Education System of the Republic of Uzbekistan until 2030". (2019, October). Retrieved from https://lex.uz/ru/docs/6971334.
[13] Fischer-Daly, M. (2019). Impunity of international labor rights violators and beneficiaries: The case of Uzbekistan. *World Development Perspectives*, 14, article number 100097. doi: 10.1016/j.wdp.2019.02.008.
[14] Gándara, D., & Rutherford, A. (2020). Completion at the expense of Access? The relationship between performance-funding policies and access to public 4-year universities. *Educational Researcher*, 49(5), 321-334. doi: 10.3102/0013189x20927386.
[15] Gao, J., Wang, W., & Wu, Y. (2024). Human capital portability and careers in finance. *Review of Financial Studies*, 37(9), 2732-2778. doi: 10.1093/rfs/hhae033.
[16] Ismayilov, V., & Karimova, V. (2023). Development of an integrated model of intellectual capital based on various approaches to "human capital". *Management and Business*, 1(2), 12-24.
[17] Ismayil-Zada, M. (2023). Analysis of physical economic theory implementation efficiency in the economic activity of Azerbaijan. *Scientific Horizons*, 26(2), 112-123. doi: 10.48077/scihor.26(2).2023.112-123.
[18] Kalyuzhna, N., Smutchak, Z., Chorna, N., Chornyi, R., Baldyniuk, O., & Chuba, R. (2024). Toolkit for multi-vector adaptation and development of corporate culture of international companies. *Lecture Notes in Networks and Systems*, 927, 501-514. doi: 10.1007/978-3-031-54009-7_45.
[19] Klingler-Vidra, R., & Liu, Y. (2020). Inclusive innovation policy as social capital accumulation strategy. *International Affairs*, 96(4), 1033-1050. doi: 10.1093/ia/iiaa091.
[20] Law of the Republic of Uzbekistan "On Education". (2020, September). Retrieved from https://lex.uz/ru/docs/5013009.
[21] Lee, C.C., Lin, C.W., & Lee, C.C. (2022). Globalization, government regulation, and country risk: International evidence. *Journal of International Trade & Economic Development*, 32(1), 132-162. doi: 10.1080/09638199.2022.2079710.
[22] Liao, X., Nawi, H.M., An, P.H., Mabrouk, F., Kholikova, R., Arnone, G., & Sahawneh, N.M. (2024). Influence of fintech, natural resources, and energy transition on environmental degradation of BRICS countries: Moderating role of human capital. *Resources Policy*, 92, article number 105022. doi: 10.1016/j.resourpol.2024.105022.
[23] Lombardozzi, L. (2023). An historical analysis of state capitalism through structural transformation: The case of Uzbekistan. *Globalizations*, 1-17. doi: 10.1080/14747731.2023.2221094.
[24] Mukhammedov, M, & Murodov, S. (2021). Venture investment as a promising area of innovative development in Uzbekistan. *Society and Innovation*, 2(6/S), 86-99. doi: 10.47689/2181-1415-vol2-iss6/s-pp86-99.
[25] Ni, L., *et al.* (2023). The role of environmental regulation and green human capital towards sustainable development: The mediating role of green innovation and industry upgradation. *Journal of Cleaner Production*, 421, article number 138497. doi: 10.1016/j.jclepro.2023.138497.
[26] Nicolás-Salas, A.B., & Lorente, Á.R.M. (2024). The influence of quality management standards on customer satisfaction in hotels: An exploratory study. *Journal of Tourism Analysis*, 31(1), 34-68. doi: 10.53596/bz36g655.
[27] Nik Abdullah, N.H., Krishnan, S., Mohd Zakaria, A.A., & Morris, G. (2022). Strategic management accounting practices in business: A systematic review of the literature and future research directions. *Cogent Business & Management*, 9(1), article number 2093488. doi: 10.1080/23311975.2022.2093488.
[28] Novykova, I., Chornyi, R., Chorna, N., Bey, R., & Leszczynski, V. (2022). Simulation of comprehensive assessments of personnel innovation development management system. *Lecture Notes in Networks and Systems*, 486, 95-108. doi: 10.1007/978-3-031-08087-6_7.
[29] Nurasheva, K.K., Shalabayev, I.I., Abdikerimova, G.I., Kulanova, D.A., & Mergenbayeva, A.T. (2024). Capital inflow and investment attractiveness of Central Asian countries (on the example of Kazakhstan). *Regional Science Policy & Practice*, 16(9), article number 100039. doi: 10.1016/j.rspp.2024.100039.
[30] Ofori, P.E., Kuuwill, A., & Quaye, B. (2024). Effect of human capital development and institutional quality on inclusive growth in African countries. *Cogent Economics & Finance*, 12(1), article number 2357155. doi: 10.1080/23322039.2024.2357155.
[31] Peng, H., Tan, H., & Zhang, Y. (2020). Human capital, financial constraints, and innovation investment persistence. *Asian Journal of Technology Innovation*, 28(3), 453-475. doi: 10.1080/19761597.2020.1770616.

[32] Ponomarenko, V., & Pysarchuk, O. (2024). Peculiarities of the impact of learning losses on the formation of human capital in Ukraine under martial law. *Economics of Development*, 23(1), 38-52. doi: 10.57111/econ/1.2024.38.
[33] Ravshanov, A.X., Suhail, M., Komilova, N., & Ravshanov, S. (2024). Medical geographical zoning in part of Uzbekistan – A regional synthesis. *Regional Science Policy and Practice*, 16(12), article number 100142. doi: 10.1016/j.rspp.2024.100142.
[34] Schultz, T.P. (2010). Health human capital and economic development. *Journal of African Economies*, 19(Supplement 3), iii12-iii80. doi: 10.1093/jae/ejq015.
[35] SIAT: Number of emigrants. (2024). Retrieved from https://siat.stat.uz/reports-filed/2437/meta-data.
[36] Statistics Agency under the President of the Republic of Uzbekistan: Demography. (2024). Retrieved from https://stat.uz/en/official-statistics/demography.
[37] Strategy of Uzbekistan 2030. (2022). Retrieved from https://strategy2030.uz/.
[38] Thien, T.H., & Hung, N.X. (2023). Intellectual capital and investment efficiency: The mediating role of strategic management accounting practices. *Cogent Business & Management*, 10(2), article number 2207879. doi: 10.1080/23311975.2023.2207879.
[39] Tran, D.V., Nguyen, P.V., Dinh, N.T.T., Huynh, T.N., & Ma, K.V. (2024). Exploring the impact of social capital on business performance: The role of dynamic capabilities, open innovation, and government support. *Journal of Open Innovation: Technology, Market, and Complexity*, 10(4), article number 100416. doi: 10.1016/j.joitmc.2024.100416.
[40] Vithana, K., Jayasekera, R., Choudhry, T., & Baruch, Y. (2021). Human Capital resource as cost or investment: A market-based analysis. *International Journal of Human Resource Management*, 34(6), 1213-1245. doi: 10.1080/09585192.2021.1986106.
[41] Wang, H., Sun, X., & Shi, Y. (2023). Commercial investment in public-private partnerships: The impact of government characteristics. *Local Government Studies*, 50(1), 230-260. doi: 10.1080/03003930.2023.2198217.

Розроблення стратегій державного регулювання для стимулювання інвестицій у людський капітал

Мурод Мухаммедов
Доктор економічних наук, професор
Самаркандський інститут економіки та послуг
140100, вул. А. Темура, 9, Самарканд, Узбекистан
https://orcid.org/000-0002-064B-198X
Ахтам Нізамов
Кандидат економічних наук, доцент
Самаркандський державний університет
140104, вул. Університетська, 15, м. Самарканд, Узбекистан
https://orcid.org/0000-0001-5348-6145
Заріна Мухаммедова
Кандидат економічних наук, доцент
Самаркандський інститут економіки та послуг
140100, вул. А. Темура, 9, Самарканд, Узбекистан
https://orcid.org/0000-0002-2999-8068
Сарвар Ісхакова
Кандидат економічних наук, доцент
Самаркандський інститут економіки та послуг
140100, вул. А. Темура, 9, Самарканд, Узбекистан
https://orcid.org/0000-0002-7371-1271
Акмаль Нізамов
Магістр, науковий співробітник
Самаркандський інститут економіки та послуг
140100, вул. А. Темура, 9, Самарканд, Узбекистан
https://orcid.org/0009-0005-2746-6227

Анотація. Мета проведеного дослідження полягала у виявленні основних проблем і викликів, що виникають у процесі розроблення стратегій державного регулювання для стимулювання інвестицій у людський капітал. У дослідженні застосовано системну методологію аналізу, що включає порівняльний аналіз міжнародного досвіду та національних підходів до державної підтримки та регулювання інвестицій у людський капітал. Основну увагу приділено трьом ключовим напрямам: освітнім, медичним і міграційним програмам. Для аналізу використано офіційні статистичні дані Республіки Узбекистан за 2019-2023 роки, включно з показниками тривалості життя, рівня освіти, обсягів інвестицій в охорону здоров'я та професійну підготовку. Порівняльна оцінка даних і практик дала змогу виявити сильні та слабкі сторони державної політики Узбекистану в галузі інвестицій у людський капітал і сформулювати рекомендації для підвищення її ефективності. Результати проведеного дослідження демонструють, що від обраної стратегії державної підтримки вкладень у людський капітал істотно залежить загальний рівень економічної стійкості країни. Вивчена практика державного регулювання інвестицій у людський капітал на прикладі Республіки Узбекистану дала змогу виявити, що успішний розвиток подібних стратегій залежить від комплексного підходу, що містить фінансування, координацію різних галузей економіки та забезпечення прозорості в реалізації програм. Зроблені в дослідженні висновки підкреслили, що для стимулювання інвестицій у людський капітал необхідне збалансоване поєднання державного регулювання та приватних ініціатив. Ключовими факторами є стале законодавче регулювання, адаптація сучасних методик управління та інвестування в довгострокові програми, спрямовані на розвиток знань, навичок, здоров'я та можливостей населення

Ключові слова: поліпшення рівня життя населення; фінансування системи освіти; соціальний захист населення; охорона здоров'я та якість життя; міграційна політика; ефективність бюджетних видатків

Scientific Bulletin
of Mukachevo State University

Series
Economics

Volume 11, No. 4, 147-159
Journal homepage: https://economics-msu.com.ua/en

UDC 35.07:332.1
DOI: 10.52566/msu-econ4.2024.147

Development of monitoring and evaluation mechanisms for the efficiency of the management system for the comprehensive recovery of territorial communities

Veacheslav Shebanin*
Doctor of Technical Sciences, Rector
Mykolaiv National Agrarian University
54008, 9 Georgiy Gongadze Str., Mykolaiv, Ukraine
https://orcid.org/0000-0002-0391-396X

Olena Shebanina
Doctor of Economics, Dean
Mykolaiv National Agrarian University
54008, 9 Georgiy Gongadze Str., Mykolaiv, Ukraine
https://orcid.org/0000-0001-7663-5991

Iryna Kormyshkina
PhD in Economics
Mykolaiv National Agrarian University
54008, 9 Georgiy Gongadze Str., Mykolaiv, Ukraine
https://orcid.org/0000-0002-7883-8423

Georgiy Reshetilov
PhD in Economics
Mykolaiv National Agrarian University
54008, 9 Georgiy Gongadze Str., Mykolaiv, Ukraine
https://orcid.org/0000-0002-3691-7975

Iurii Kormyshkin
Doctor of Economics, Professor
Mykolaiv National Agrarian University
54008, 9 Georgiy Gongadze Str., Mykolaiv, Ukraine
https://orcid.org/0000-0002-1005-1229

Received: 02.09.2024, Revised: 26.11.2024, Accepted: 27.12.2024

Suggested Citation: Shebanin, V., Shebanina, O., Kormyshkina, I., Reshetilov, G., & Kormyshkin, Iu. (2024). Development of monitoring and evaluation mechanisms for the efficiency of the management system for the comprehensive recovery of territorial communities. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 147-159. doi: 10.52566/msu-econ4.2024.147.

*Corresponding author

Abstract. The study aimed to establish a system for monitoring and evaluating the recovery of territorial communities in Ukraine affected by armed conflict. Key areas of monitoring – economic, social, environmental, and governance – were identified. Economic indicators, such as investment and job creation, were established as metrics of stability, while social indicators, including employment and access to services, proved critical for quality of life. Environmental indicators emphasized reducing emissions, improving energy efficiency, and using renewable energy. Governance indicators underscored the need for coordination, participation, and resource transparency. The central achievement was the development of a digital platform capable of real-time data collection and analysis, automating data integration from diverse sources for visualized operational analysis. The platform was accompanied by a roadmap outlining key stages, from planning and integration to testing and full implementation, ensuring its effective deployment across communities. This systematic approach was proved to significantly contribute to sustainable development by promoting efficient resource use, environmental responsibility, and improved governance. The findings highlighted that a comprehensive monitoring system supports recovery processes by enabling timely adjustments and ensuring transparency. These mechanisms were established as essential for achieving long-term stability and resilience in conflict-affected regions. The study's outcomes emphasize the critical role of integrated platforms and structured approaches in enhancing the effectiveness of recovery efforts while fostering trust and collaboration among stakeholders

Keywords: control tools; performance analysis; administration; local associations; territorial communities; management system

Introduction

One of the most relevant tasks for Ukraine in the current difficulties is the restoration of territorial communities affected by the armed conflict. The rehabilitation of the affected regions requires a comprehensive approach that includes not only the restoration of the destroyed infrastructure but also the implementation of sustainable practices that can guarantee sustainability and development in the long term. In this context, it is important to develop effective methods for monitoring and evaluating the effectiveness of recovery management. The relevance of the topic lies in the fact that the recovery of communities after the conflict is critical to restoring social and economic stability in Ukraine. Territorial communities are the basis for regional development, and the recovery of the entire country depends on their effective functioning. There is an urgent need for effective monitoring tools to assess progress in rebuilding infrastructure, the economy and social conditions, ensuring transparency and accountability.

The problematic aspect of the topic is the lack of clear and universal mechanisms for assessing the effectiveness of recovery measures. Currently, many regions of Ukraine are at different stages of recovery, which makes it difficult to assess their progress uniformly (Ismayilzada *et al*., 2024). In addition, there is a need to implement sustainable practices that account for environmental, social and economic aspects of development. Particular attention should be paid to the resilience of infrastructure, the adaptation of local enterprises to new conditions, and access to finance for small and medium-sized businesses. These aspects are critical to the economic stability of communities. Coordination between central and local authorities, international partners, and civil society organisations is also an important challenge to ensure that recovery strategies are implemented in a coordinated manner (Hysi *et al*., 2024). Lack of coordination can lead to duplication of efforts or waste of resources, which will negatively affect the effectiveness of recovery processes.

The development of monitoring and evaluation mechanisms will not only allow for the effective management of recovery processes but also for the timely identification of problems and shortcomings in strategies. This will make it possible to adjust approaches and ensure the sustainability of results, contributing to the long-term stability and development of conflict-affected regions. Currently, this topic is not widespread in scientific works, as the development of mechanisms is quite difficult in a time of war due to the constantly changing situation in Ukraine and partner countries, which support creating tools for monitoring and evaluating the effectiveness of the management system for the integrated recovery of territorial communities.

The role of integrated territorial plans in ensuring resilience to external challenges in Chinese cities was considered by Y. Shao *et al.* (2023). The authors emphasised the need to implement performance measurement systems for community recovery but did not sufficiently address less developed communities, which is a gap. The urban development of Santiago was considered with an emphasis on the importance of strategic planning. C. Boano & F. Vergara-Perucich (2017) found that the integration of social and economic components contributes to more effective recovery, but the authors did not consider the technical aspects of creating monitoring tools. The authors analysed the planning reform in Irish cities with a focus on citizen engagement in the monitoring process. W.M. Brady (2016) concluded that effective monitoring mechanisms can increase trust in government, but did not focus on modern digital monitoring tools. A study of cross-sectoral partnerships in Poland emphasised the importance of social responsibility during recovery. M. Furmankiewicz *et al.* (2016) drew attention to the insufficient coverage of environmental aspects of monitoring in their study.

The importance of territorial approaches to recovery was analysed, emphasising the need for public involvement.

TANGO – Territorial Approaches for New Governance (2013), emphasised the participation of local communities, but the environmental component remained insufficiently explored. Strategic recovery planning emphasised the importance of introducing digital tools to monitor progress. A. Asadzadeh *et al.* (2023) investigated how effective urban governance and planning systems can strengthen the resilience of urban areas to various challenges. They concluded that the integration of innovative approaches and active community engagement are key elements to achieving transformational resilience in the urban environment. J. Katona-Kovács *et al.* (2011) emphasised that economic indicators, such as the level of attracted investment and job creation, should be an integral part of this process. Innovative monitoring methods help to evaluate the effectiveness of the restoration of territories. R. Boschma (2008) emphasised the importance of innovation but did not sufficiently explore the social aspects of monitoring. The author also addressed the need to integrate modern digital technologies, such as big data analysis, to improve the quality of monitoring.

The study aimed to identify effective tools for monitoring the processes of recovery of territorial communities and to introduce methods for objective assessment of the results of management measures aimed at the sustainable development of the affected regions. The objective of this study is to analyse and evaluate existing approaches to the recovery of territorial communities, which will identify the most effective practices and gaps that require further research. The second task is to develop recommendations for the implementation of effective mechanisms for monitoring and evaluating the effectiveness of recovery management, which will ensure sustainable development and long-term resilience of the affected regions.

Materials and Methods

This study used a comprehensive approach that included several stages of analysis and the use of various methodological tools to develop mechanisms for monitoring and evaluating the effectiveness of management of the process of restoring territorial communities in Ukraine. The study was conducted in 2023-2024.

The first stage of the study was to analyse the legal framework governing the restoration of territorial communities, in particular, Law of Ukraine No. 13 "On the Principles of State Regional Policy" (2015) and Regional development strategy: New challenges, plans and digital technologies (2023). A detailed study of international agreements and documents (European Green Deal, 2023) that provide for the implementation of sustainable practices in community recovery processes was conducted. This allowed for the formation of a theoretical basis for further research and ensured the consistency of approaches with international standards.

The second stage involved collecting and analysing socio-economic data on the affected communities. Statistical materials were used for this purpose (Ukraine common country analysis, 2021). Key indicators of community development were analysed, including employment rates, incomes, investment volumes, environmental conditions and infrastructure. This data became the basis for the development of monitoring mechanisms.

The third stage of the study included the development of monitoring mechanisms based on a roadmap. This tool defined the stages of implementation of monitoring processes, as well as to establish the sequence of actions, responsible persons and deadlines. The roadmap included the following key steps: identification of indicators for monitoring, development of data collection tools, analysis of the results and evaluation of the effectiveness of the implemented measures. The method also ensured that the monitoring mechanisms could be adapted to the different conditions and needs of each territorial community. One of the most important tools at this stage was a risk analysis, which helped to identify potential threats to the recovery process. Political, economic, social and environmental risks that could affect the success of the projects were assessed. This helped to develop strategies to reduce risks and increase the resilience of communities to threats (Dorosh, 2023).

At the final stage of the study, a comparative analysis of the results of the roadmap implementation in different communities was carried out to identify the most effective approaches. Performance was assessed using Key Performance Indicators (KPIs) (2024), which included the level of infrastructure restoration, economic growth, social stability, and implementation of environmental standards. Thus, the use of the roadmap as the main monitoring tool allowed for a systematic approach to managing the recovery of territorial communities, as well as the development of tools to assess the effectiveness of these processes at all stages of implementation.

Results

Comprehensive strategies for restoring war-affected territorial communities in Ukraine

Given the current challenges caused by the armed conflict, a key task for Ukraine is to ensure the restoration of territorial communities affected by the war. The process should include not only the restoration of destroyed infrastructure but also the creation of socio-economic stability and the implementation of environmentally friendly solutions. Territorial communities that have suffered significant losses require careful coordination of efforts at all levels – from local authorities to international partners – to ensure long-term development. Improvement of the recovery process requires a systematic approach that includes the assessment of socioeconomic indicators, the use of modern surveillance methods and the monitoring of results at each stage. In this context, the development and implementation of monitoring mechanisms that will allow timely assessment of the effectiveness of recovery measures, respond to changes and adjust strategies in response to new challenges is of particular importance.

Law of Ukraine No. 13 (2015) provides the main principles of regional development that are critical for the recovery of communities from disaster. In the context of this study, this law defines key tasks, including stimulating economic development and ensuring coordination between state authorities and communities. One of the important aspects that needs to be monitored is the implementation of a sustainable development strategy, which involves increasing economic activity by attracting investment and creating new jobs. In the context of community recovery, it is also necessary to ensure environmental sustainability, which is an integral part of the process. European Green Deal (2023), focusing on the principles of sustainable development, defines the introduction of energy-saving technologies and environmentally friendly solutions in the reconstruction of infrastructure (Krawczyńska *et al.*, 2024). In this study, this document is considered as a strategic direction for integrating environmental standards into the process of restoring territorial communities. Emphasis is placed on the modernisation of infrastructure using renewable energy sources and environmentally friendly materials. In addition to national and international documents, it is necessary to address specific plans, such as Planning the Development of Territorial Communities: Training Manual for Local Government Officials (Vasylchenko *et al.*, 2015). The restoration of the affected regions is required, and the author of this document identifies specific steps to support economic development through the introduction of innovative technologies, job creation and improvement of social infrastructure. Monitoring the implementation of this plan is important for assessing the effectiveness of recovery management. Another important document is Green Reconstruction of Ukraine: Position of Civil Society (2022), which focuses on the introduction of energy-saving technologies in the recovery process. This programme is key to integrating environmental standards into the reconstruction of the infrastructure of affected communities. Its implementation will help to achieve high environmental standards in the framework of recovery efforts. Aspects of community recovery are presented in Table 1.

The main areas to be monitored are economic growth, social stability and environmental sustainability. Each of these areas has its unique indicators that can be used to track progress in a timely manner and make the necessary management decisions to adjust the strategy (Table 2).

Table 1. Key aspects of the restoration of territorial communities

Document	Main focus	Metrics to monitor
Law of Ukraine No. 13 "On the Principles of State Regional Policy" (2015)	Economic development of regions, coordination between state and local authorities	Investment attraction, number of new jobs
European Green Deal (2023)	Implementation of environmental technologies in infrastructure rehabilitation	Reducing emissions, using renewable energy sources
Planning the Development of Territorial Communities: Training Manual for Local Government Officials (2015)	Supporting socio-economic development and innovation	Creating jobs, improving social infrastructure
Green Reconstruction of Ukraine: Position of Civil Society (2022)	Restoring critical infrastructure with a focus on the environment	Implementation of energy-saving technologies

Source: compiled by the authors

Table 2. Key metrics to monitor

Area	Value	Measurement unit
Economic growth	Attracting investment	Million UAH
	Number of new jobs	Amount
	Gross regional product (GRP) growth	%
Social stability	Employment level	%
	Share of the population with access to basic social services	%
	Number of people receiving social services	Number of people
Environmental sustainability	Reducing greenhouse gas emissions	t CO_2
	Share of renewable energy sources usage	%
	Energy efficiency of buildings	kW·hour/m² per year

Source: compiled by the authors based on K. Smits *et al.* (2019), Economic Activity Indicators (2022), J. Gyiimah *et al.* (2023) and Regional development strategy: New challenges, plans and digital technologies (2023)

The table shows the key indicators that allow for assessing the effectiveness of community recovery in three main areas: economic growth, social stability and environmental sustainability. Within the framework of economic growth, investment attraction and the number of new jobs are critical in determining the economic development of a community. These indicators can be used to assess the extent to which the community is successfully integrating into the recovery process and the extent to which the resources attracted contribute to its economic revival.

Social stability is equally relevant, as employment rates and access to social services indicate the level of integration of residents into the restored communities (Ponomarenko & Pysarchuk, 2024). The provision of employment and

services, such as healthcare and education, are critical to overcoming the social problems caused by the conflict. Environmental sustainability, including greenhouse gas emission reductions and the use of renewable energy sources, emphasises the importance of environmental aspects in the recovery process (Brovina & Sallaku, 2024). These indicators not only reduce the negative impact on the environment but also increase the level of environmental responsibility of communities, ensuring their long-term sustainability. Thus, the combination of economic, social and environmental indicators in the monitoring system creates a comprehensive picture of the state of community recovery and allows for effective management decisions for further development.

Benchmarking and monitoring governance effectiveness in post-conflict community recovery

In the process of restoring territorial communities in Ukraine, a range of methods are used to assess the effectiveness of governance, particularly in the economic, social and environmental areas. A comprehensive monitoring system based on quantitative and qualitative indicators allows for the assessment of progress in community recovery. This system is based on the analysis of national and international documents. In this context, the benchmarking method is important because it offers a comparative analysis of the effectiveness of community management.

The benchmarking methodology can be used to compare the management results of different communities based on specific indicators, such as employment, per capita income, investment attractiveness and efficiency of local resource use. For this topic, this approach is particularly valuable as it not only assesses the current state of communities but also tracks the dynamics of changes through comparison with other communities. Important indicators for assessing the economic and social efficiency of management are:

1. The number of employed people in the restored communities indicates economic growth and successful job creation.
2. Per capita income, which reflects the economic condition of the community and the level of well-being of its residents.
3. The volume of investments in infrastructure and social projects demonstrates the attractiveness of communities to investors.
4. The efficiency of the use of local taxes indicates the financial stability of the community and the rational use of resources.

As they show the economic stability and progress of communities after conflict, these indicators can serve as the basis for a monitoring system. Benchmarking tools not only assess how well governance is working but also identify areas where additional investment and attention are needed. The main indicators are shown in Table 3.

Table 3. Key indicators for monitoring using the benchmarking methodology

Value	Measurement unit	Values to monitor
Number of employed people	amount	Evaluating the success of job creation
Income per capita	UAH	Level of economic well-being
Investment volume	million UAH	Investment attractiveness of the region
Effective use of taxes	%	Financial sustainability

Source: compiled by the authors based on L. Courtney (2023)

The use of these indicators in the monitoring process provides a comprehensive assessment of the state of community recovery and allows tracking progress in key development areas such as employment, economic well-being and financial sustainability. The monitoring system is based on clearly defined KPIs that are used for an objective assessment of progress in areas such as governance, economic, social and environmental. These indicators will be monitored regularly and the data analysed to help managers make better decisions (Table 4).

Table 4. Economic indicators for monitoring

Value	Description
Gross domestic product (GDP)	The total market value of all goods and services produced in the country.
Inflation level	A measure of the growth of prices for goods and services over time.
Unemployment rate	The share of the population that is actively looking for work but cannot find it.
Consumer confidence index	Reflects consumer optimism about the economy and their willingness to spend money.
Currency exchange rate	The value of the national currency against foreign currencies.

Source: compiled by the authors based on G. Verstraete (2023)

This Table 4 shows the main economic indicators that are key to monitoring and forecasting the economic situation. Indicators such as GDP, inflation, unemployment, consumer confidence and exchange rates provide a snapshot of the overall health of the economy, labour market stability and consumer sentiment. They play an important role in the development of economic strategies and decisions on investment and economic development (Table 5).

Table 5. Social indicators of monitoring

Value	Description
Employment	Percentage of the working population compared to the working-age population of the community
Access to healthcare services	Number of healthcare facilities per 1000 inhabitants, accessibility of services for the population
Access to educational services	Number of educational institutions per 1000 inhabitants, level of provision of educational services
Level of Social Security	Number of people receiving social benefits as a percentage of the total population

Source: compiled by the authors based on Resolution No. 449 "On Approval of the Procedure for Monitoring the Provision and Evaluation of the Quality of Social Services" (2020)

Employment rates, access to healthcare and education services, and social protection are reflected in social indicators. This can be used to observe the quality of life of people in the communities that have been restored. Effective monitoring of these indicators will help improve social stability and prevent social crises (Table 6).

Table 6. Environmental monitoring indicators

Value	Description
Reducing greenhouse gas emissions	The amount of CO_2 emissions reduced in tonnes per year compared to pre-war levels.
Share of renewable energy sources usage	Percentage of total energy capacity generated from renewable sources
Energy efficiency of buildings	Number of modernised buildings with improved energy efficiency, number of buildings meeting new standards

Source: compiled by the authors based on Environment and climate change Canada (2024)

Environmental indicators, such as greenhouse gas emission reductions, the use of renewable energy sources and energy efficiency of buildings, are key to assessing the sustainable development of communities. These indicators can be used to assess the environmental impact of restoration processes and their compliance with modern environmental standards (Table 7).

Governance indicators can be used to assess the effectiveness of different levels of government, community participation in decision-making, transparency of financial management, and responsiveness to new challenges. Monitoring of these parameters will ensure accountability and transparency in the use of resources, as well as increase the effectiveness of recovery management. Thus, all the indicators presented in the tables are important components of the monitoring system. This can be used to quickly assess the effectiveness of treatment and take the necessary corrective actions.

Table 7. Management monitoring indicators

Value	Description	Measurement unit
Level of achievement of goals	Degree of achievement of the organisation's strategic goals and plans	%
Efficiency of management decisions	Effectiveness of management decisions in response to challenges and problems	Number of solutions
Degree of community involvement	Share of the population involved in decision-making and management processes	%
Transparency of the management process	Open access to information on decision-making processes	Number of published reports
Timeliness of management decision-making	Time required to make and implement decisions in crises	Days
Level of coordination between management levels	Cooperation and coordination between different levels of government in the decision-making process	%
Degree of compliance with regulatory requirements	Percentage of decisions that comply with applicable laws and regulations	%

Source: compiled by the authors based on R. Mosse & L.E. Sontheimer (1996)

Digital platform development for monitoring and evaluating community recovery process

Participation in the creation of a digital platform for data collection and analysis is an important part of the process of monitoring and evaluating the effectiveness of the process of restoring territorial communities in Ukraine. The platform will be able to collect, store and analyse important indicators from economic, social, environmental and governance perspectives. The following examples will demonstrate how this platform can improve monitoring and evaluation.

The platform will provide automated data collection from a variety of sources, including private and public organisations, city administrations and non-government organisations. For instance, economic indicators, such as investment attraction and job creation, will be continuously reviewed based on data from local administrations and business registers. The integration of real-time data will allow for a more accurate assessment of the state of recovery and avoid delays in decision-making. This will allow the government to respond quickly to changes, such as job

losses or investments. This platform is designed to analyse data using analytical tools and algorithms that will help identify correlations between different indicators, predict future trends and assess the impact of various factors on the recovery process. For example, data from the environmental monitoring system can be used to analyse environmental indicators such as greenhouse gas emissions or the energy efficiency of buildings. This can be used to quickly identify communities where additional measures need to be introduced to reduce the negative impact on the environment.

The analytical tools on the platform can also be used to conduct comparative analysis using benchmarking methods. This assesses the effectiveness of the recovery of individual communities based on comparisons with other communities. For example, a community that shows less growth in attracting investment will be able to study the strategies of more successful communities and adjust its approaches. A geographic information system (GIS) is an important component of monitoring. Demonstration of data on a map is particularly relevant for infrastructure and environmental monitoring. GIS can track the energy efficiency of buildings in different regions and identify the best locations for retrofitting or introducing renewable energy sources. In addition, GIS can indicate locations with high emissions, allowing the government to take immediate action to reduce harmful environmental impacts (Jonker, 2023).

Another important function of the platform will be to monitor social indicators, such as employment and access to social services. Through automated data collection, the platform will be able to show changes in these indicators at different stages of recovery. For instance, if the employment rate in a particular community is not growing as planned, the system will identify which sectors need additional support or investment. Governance indicators, such as coordination between different levels of government and the level of community participation in decision-making, are also an important element of monitoring (Téllez *et al.*, 2022). The platform will ensure the transparency of these processes by publishing data on project implementation, the number of public consultations, and the speed of response to new challenges. This will not only assess the effectiveness of governance but also involve the public in monitoring processes, increasing the level of trust in local and state authorities.

The system will also include a KPI system. The implementation of KPIs is one of the critical aspects of the monitoring system for the recovery of territorial communities. These indicators allow tracking the success and progress of recovery activities in all 4 areas. The main advantage of implementing KPIs is that the data obtained through the automated platform can be updated in real-time. This allows authorities to quickly and objectively assess the current situation in each community. For example, if the investment attraction indicators in a particular region do not meet the expected results, managers can immediately revise the strategy and take additional measures to attract investors. Similarly, the system can quickly take action to address problems if there is a decline in employment or deterioration in access to healthcare services.

Quarterly and annual reports based on key indicators will allow for the timely recording of recovery progress. Such reports will promote transparency and help communities and government authorities allocate resources more effectively. Quarterly reporting can be used to quickly identify short-term problems and shortcomings in the implementation of recovery measures. For example, KPIs can identify factors that delay project implementation, such as insufficient funding or poor coordination between different levels of government. This allows corrective measures to be taken quickly. Annual reports will be more detailed and will help to assess the overall progress and long-term results of restoration projects.

The automated platform allows for the integration of KPIs into one system, providing real-time transparency and analytics (Abril-Jiménez *et al.*, 2024). This increases the efficiency and trust of the population in the recovery process. For example, communities can see the concrete results of local authorities' work when they have access to information on employment rates and the status of environmental projects in their area. Moreover, the availability of real-time data allows for flexible decision-making. If one community performs well on certain indicators, their experience can be applied to other regions (Trusova *et al.*, 2020).

Once the KPIs for monitoring community recovery have been identified, it is necessary to develop a clear action plan for implementing this system. The roadmap defines the sequence of steps that will allow for the effective implementation of the monitoring system and ensure its successful functioning at all stages of community recovery. Each stage of implementation has its tasks and deadlines. From defining KPIs to the full implementation of the platform, the roadmap helps to coordinate the efforts of all stakeholders and ensure transparency and control at each stage.

The first stage is the planning stage, which takes 1-2 months. At this stage, clear objectives and goals of the monitoring system are developed. This includes analysing the needs of each community, identifying key indicators for monitoring (economic, social, environmental and governance), and forming a team of developers and responsible persons. The planning process involves collecting and assessing the resources needed for implementation and establishing communication between all stakeholders.

The second stage is data integration, which takes 3-5 months. This step involves automated data collection from various sources, such as state registers, local administrations, non-government organisations and the private sector. This stage involves integrating the platform with existing databases and creating a common database for storing and processing information.

The third stage is the development of the platform for 6-8 months. The development of the technical infrastructure and creation of software for data collection, processing and visualisation. At this stage, analytical tools are developed to enable real-time analysis. Particular attention

should be paid to data security and flexibility of the platform for its further development.

The fourth stage is pilot testing 9-10 months. At this stage, the system is launched in several pilot communities to test its performance. Testing will help identify possible technical issues and improve the system's functionality. An important aspect is to receive feedback from users for further improvement.

The fifth stage is a full-scale implementation in 11-12 months. After successful testing, the system will be implemented in all communities. At this stage, local government employees are trained on how to use the platform, and all regions are connected to the system. Users should be supported, and any technical issues should be resolved promptly.

The final stage is continuous monitoring and optimisation, with no end in sight. This stage involves constant data updates and analysis of the system's performance. Prompt adjustments to the recovery process will allow strategies to be adapted depending on the results of monitoring. The platform will also allow for analysis and reporting to the public on the progress of recovery. The roadmap is presented in Figure 1.

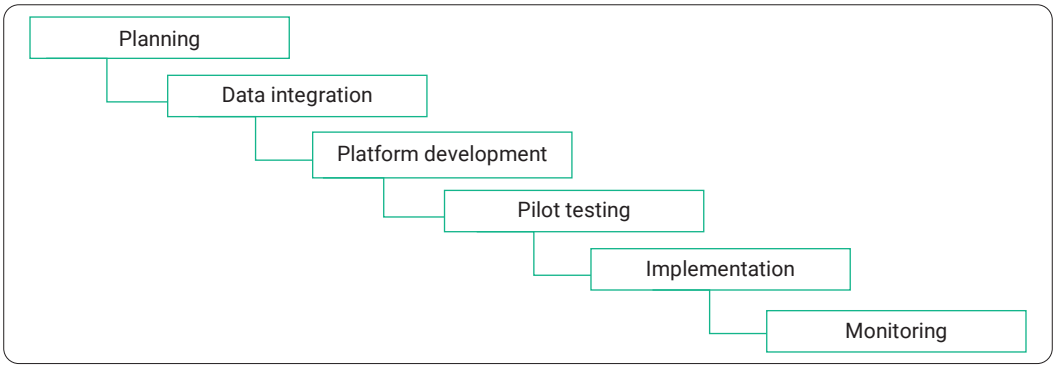

Figure 1. Roadmap for the creation of a monitoring system
Source: compiled by the authors

Effective data integration and the development of a digital platform create the basis for convenient and accurate monitoring of the state of infrastructure, economic performance and social stability of communities. Thanks to these tools, managers can respond quickly to changes, and communities gain transparency and control over the recovery process. Continuous monitoring and optimisation will help make the system flexible and able to adapt to new challenges, ensuring long-term stability and development.

The comprehensive recovery of conflict-affected communities requires a holistic approach and the integration of economic, social, environmental and governance indicators. KPIs are used to monitor and evaluate performance and allow for real-time tracking of progress. The development of a roadmap or itinerary, as well as the use of a digital platform for data collection and analysis, ensures consistency of actions and management at each stage of recovery. This allows for sustainable community development and rapid response to problems.

Discussion

In this study, mechanisms for monitoring and evaluating the effectiveness of the integrated community recovery management system were developed. These include the creation of a digital platform and a roadmap to facilitate monitoring. In the context of Law of Ukraine No. 13 (2015), the research findings confirm the importance of this document for the recovery of communities, especially through its emphasis on regional economic development and investment attraction. The research findings are in line with the approach outlined in the document, which identifies the importance of coordination between different levels of government for the effective management of recovery processes. This analysis confirms that the economic activity of communities after recovery is significantly increasing due to the implementation of measures envisaged in the law.

The study also confirmed the importance of introducing innovative technologies to ensure the sustainable development of communities, which correlates with the Planning the Development of Territorial Communities strategy: Training Manual for Local Government Officials (Vasylchenko, 2015). This study pays special attention to the creation of new jobs and the development of social infrastructure, which is also reflected in the document.

Y. Shao *et al.* (2023) investigated the role of comprehensive territorial plans in Chinese cities, with a particular focus on resilience to external challenges such as natural disasters and social change. In common with this study is the focus on economic indicators such as investment attraction and job creation. Both studies recognise that monitoring the economic aspects of recovery is important to ensure the long-term resilience of communities. However, Y. Shao *et al.* emphasised the regional aspects of planning, while this study focuses on local communities and their ability to adapt quickly. An important distinguishing point is also the attention to environmental aspects in this study, which was not considered in such detail in their approach.

C. Boano & F. Vergara-Perucich (2017) highlighted the integration of social and economic components in the urban regeneration of Santiago. As in the present study, the

importance of an integrated approach that combines several indicators to ensure community resilience was emphasised. However, their work does not pay enough attention to the technical aspects of monitoring and the implementation of digital tools to assess the effectiveness of management processes, which is one of the key components of this study. Additionally, social indicators such as access to social services and employment rates are important in both works, but this study pays more attention to environmental aspects such as reducing greenhouse gas emissions and using renewable energy sources.

J. Katona-Kovács *et al.* (2011) emphasised the importance of economic indicators for monitoring, such as investment and job creation, which is in line with the approach of this study. However, in contrast to this study, their study devotes less emphasis to environmental indicators, which are an integral part of a holistic approach to recovery. In addition, their study does not sufficiently cover the use of digital tools for monitoring, which is considered an important element in this context. R. Boschma (2008) emphasised the importance of innovation for effective monitoring of recovery processes, which is in line with the approach of this study. However, in contrast to the approach proposed in this study, author did not address sufficiently the social aspects of monitoring, in particular, social stability and access to services. The aforementioned study focuses more on economic and innovation indicators, but less on environmental sustainability and the impact of recovery on social change, which are important components of this study.

The U.S. Department of Commerce (2023) identifies commonalities with the theme of community recovery, including the importance of monitoring, data management, and transparency. Both themes emphasise the importance of data collection and analysis for management decision-making. The differences lie in the fact that the report focuses on the technical aspects of information management, while the research on community recovery pays more attention to the physical and social aspects of recovery, including economic and social resilience. The National Intelligence Strategy (2023) shows similarities in the approach to monitoring and performance evaluation. Both strategies emphasise the importance of continuous monitoring to achieve goals and coordination between different levels of government. However, the differences lie in the fact that the intelligence strategy focuses on national security and data collection, while the community recovery strategy emphasises socio-economic aspects such as attracting investment, creating jobs and environmental sustainability.

Research on spatial planning in China focuses on the creation of a system for overseeing and implementing spatial planning from a sustainability perspective. Studies conducted by S. Chen *et al.* (2023) emphasise the importance of building a supervisory system that considers economic and environmental factors that contribute to the sustainability of space. This coincides with the approach taken by Ukrainian scholars, especially in this study, which also focuses on environmental sustainability and the use of renewable energy sources in the process of community recovery. However, the Chinese research focuses on developing a management strategy at a much broader regional level than in the case of Ukrainian communities, which focuses on local aspects of territorial recovery.

The International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) (2023) emphasises the importance of community participation in restoration processes. In particular, the study emphasises the need for transparent monitoring and the involvement of residents in the decision-making process. This approach correlates well with Ukrainian recovery strategies, which also emphasise community participation in the management of recovery projects and monitoring of social stability indicators. Thus, it can be noted that international research and Ukrainian experience in community recovery have common features in terms of environmental sustainability, community participation, and the need for transparent and effective monitoring. At the same time, international practices show opportunities for expanding the Ukrainian monitoring system to the level of broader territorial planning, which could be useful in the future.

H.J. Shatz *et al.* (2022) based a study of previous reconstruction efforts, such as plans for post-World War II Europe, South Sudan and Afghanistan. The focus is on the need for security, transparent funding and clear monitoring at every stage of reconstruction. This overlaps with Ukrainian studies, which also emphasise transparency and security. However, in the case of Ukraine, the emphasis is on the integration of environmental aspects and a sustainable development strategy, which was not so evident in the foreign examples mentioned above. The RAND organisation emphasises the importance of international cooperation for long-term security and economic recovery, as well as the use of private capital and international donors. Another study presented by the Brookings Institution (Wessel & Asdourian, 2022) also considers the reconstruction of countries such as Afghanistan and South Sudan. It emphasises the importance of making less ambitious promises and focusing on practical measures to avoid disappointment. This follows Ukrainian approaches to attracting investment and transparently monitoring governance performance, but Brookings adds the importance of political stability as a key factor in successful recovery, which is also relevant for Ukraine.

In summary, research shows that the recovery of territorial communities after war requires a comprehensive approach that considers economic, social, environmental and institutional factors. The introduction of modern digital platforms to monitor and evaluate the effectiveness of recovery management is an important component of effective recovery, as it allows for the timely identification of problems and adjustments to plans. Thus, transparency, efficiency, and attracting international investment are important factors for long-term economic development.

The results of the study confirm that sustainable development and the introduction of environmental innovations, especially renewable energy sources, are vital, which

is consistent with the methods presented in Ukrainian and international studies. Community involvement in the recovery process is important as it promotes social stability and increases trust in management decisions. International research suggests broader regional strategies that could be used in the future in Ukraine, although Ukrainian methods focus on local aspects of restoration and monitoring. To achieve resilience and community development, cooperation between central and local authorities, as well as international partners, must continue.

Conclusions

The recovery of communities affected by armed conflict requires the implementation of a comprehensive multi-level performance monitoring and evaluation system. This process covers governance, economic, social and environmental indicators that are vital to achieving sustainable development. Attracting investment, creating new jobs and businesses, and increasing the productivity of enterprises are factors that determine economic performance, which is relevant for community recovery. As a result, it helps to strengthen the economic base of communities and restore their economic potential.

In addition, social indicators are very important as they show the level of social stability and well-being. Maintaining social balance and preventing social crises depends on restoring employment, access to health and education services, and the provision of social guarantees. Monitoring these elements facilitates the integration of residents into the restored communities and helps to solve problems quickly. Environmental indicators are also critical in the recovery process, as ensuring environmental sustainability is a key task for preserving natural resources and ensuring environmental safety. Reducing greenhouse gas emissions, increasing the energy efficiency of buildings, and using renewable energy sources contribute to achieving environmental standards and ensuring the sustainable development of local communities. These metrics are important not only for improving the environmental situation but also for improving the quality of life of residents, as environmental safety is an integral part of the overall well-being of communities.

Governance indicators help to assess the effectiveness of government at different levels, coordination between them, and community involvement in decision-making. Transparency in financial and management processes, timely response to challenges, and accountability for the use of resources are key elements to ensure effective community recovery. Citizen participation in decision-making processes is an important aspect, as it increases the level of trust in the authorities and promotes social cohesion. The implementation of key performance indicators is the basis for monitoring and evaluating the results of recovery measures. Importantly, the KPI system can monitor progress in real-time, which enables timely decision-making and adjustments to strategies depending on changes in the situation. Regular reporting on KPIs allows not only to identification of problematic aspects but also to assessment of successes at different stages of recovery, which increases transparency and accountability of the authorities to the community.

Creating a roadmap for the implementation of the monitoring system is a key element to ensure consistent and effective implementation of tasks at each stage of community recovery. This map contains specific steps with clear tasks and deadlines, which helps coordinate the efforts of all stakeholders and ensures control at all levels. From the planning stage to the full implementation of the system, the roadmap helps to structure the recovery process and ensure that the goals are achieved. The successful implementation of the monitoring system will help create conditions for the sustainable development of territorial communities and increase their resilience to external challenges.

One of the main limitations of this study is the dependence on the availability of high-quality and up-to-date data to assess the effectiveness of the community recovery management system. Incomplete or untimely data can negatively affect the accuracy of monitoring and the correctness of decisions. In addition, the study does not address possible challenges related to external economic and political factors that may significantly affect the recovery process. Promising areas for further research include the development of a monitoring system that accounts for the impact of external risks, such as economic instability or changes in the legal framework. It is also important to explore the possibilities of integrating the latest technologies, such as Big Data, to improve the process of data collection and analysis. This will improve the effectiveness of recovery management and make it more adaptive to rapidly changing conditions.

Acknowledgements

None.

Conflict of Interest

None.

References

[1] Abril-Jiménez, P., Carvajal-Flores, D., Buhid, E., & Cabrera-Umpierrez, M.F. (2024). Enhancing worker-centred digitalisation in industrial environments: A KPI evaluation methodology. *Heliyon*, 10(4), article number e26638. doi: 10.1016/j.heliyon.2024.e26638.

[2] Asadzadeh, A., Fekete, A., Khazai, B., Moghadas, M., Zebardast, E., Basirat, M., & Kötter, T. (2023). Capacitating urban governance and planning systems to drive transformative resilience. *Sustainable Cities and Society,* 96, article number 104637. doi: 10.1016/j.scs.2023.104637.

[3] Boano, C., & Vergara-Perucich, F. (2017). *Neoliberalism and Urban Development in Latin America: The Case of Santiago.* London: Routledge. doi: 10.4324/9781315648705.

[4] Boschma, R. (2008). Regional innovation policy. In *Micro-foundations for innovation policy* (pp. 315-342). Amsterdam: Amsterdam University Press. doi: 10.1017/9789048501304.013.
[5] Brady, W.M. (2016). Territorial development, planning reform, and urban governance: The case of Ireland's second tier cities. *European Planning Studies,* 24(12), 2217-2240. doi: 10.1080/09654313.2016.1248906.
[6] Brovina, F., & Sallaku, D. (2024). Sustainable development of forest parks for active recreation: A balance between nature conservation and physical education. *Ukrainian Journal of Forest and Wood Science*, 15(3), 165-179. doi: 10.31548/forest/3.2024.165.
[7] Chen, S., Zhu, C., Ouyang, X., & Han, Y. (2023). Research on the supervision and implementation system of territorial space planning from the perspective of resilience. *Sustainability,* 15(20), article number 14682. doi: 10.3390/su152014682.
[8] Courtney, L. (2023). An evaluation of the effectiveness of neighbourhood planning in England. (BA dissertation, De Montfort University, Leicester, United Kingdom).
[9] Dorosh, Y., Dorosh, A., Derkulskiy, R., & Bratinova, M. (2023). Application of GIS in land management on the example of Ukraine. *Polish Journal of Local Administration Sciences,* 23(1), 31-41. doi: 10.31648/aspal.9140.
[10] Economic Activity Indicators. (2022). Retrieved from https://climatedata.imf.org/pages/re-indicators
[11] Environment and climate change Canada. (2024). *Canadian environmental sustainability indicators: global greenhouse gas emissions.* Retrieved from https://www.canada.ca/content/dam/eccc/documents/pdf/cesindicators/global-ghg-emissions/2024/global-greenhouse-gas-emissions-en.pdf.
[12] European Green Deal. (2023). Retrieved from https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en.
[13] Furmankiewicz, M., Macken-Walsh, Á., & Stefanska, J. (2016). Territorial governance, networks, and power: cross-sectoral partnerships in Rural Poland. *Geografiska Annaler: Series B, Human Geography*, 96(4), 345-361. doi: 10.1111/geob.12056.
[14] Green reconstruction of Ukraine: Position of civil society. (2022). Retrieved from https://en.ecoaction.org.ua/green-reconstruction-ukraine.html.
[15] Gyiimah, J., Fiati, M.K., Nwigwe, U.A., Vanessa, A.E., & Yao, X. (2023). Exploring the impact of renewable energy on economic growth and carbon emissions: Evidence from partial least squares structural equation modelling. *PLoS One,* 18(12), article number e0295563. doi: 10.1371/journal.pone.0295563.
[16] Hysi, A., Avdulaj, J., Shahini, E., Goga, I., & Shahini, E. (2024). Role of legal regulation in the establishment and development of the public administration system with local self-government aspects. *Social and Legal Studios*, 7(1), 27-36. doi: 10.32518/sals1.2024.27.
[17] International centre for the study of the preservation and restoration of cultural property. (2023). *Enhancing capacities in Ukraine for cultural heritage first aid and recovery planning.* Retrieved from https://www.iccrom.org/news/enhancing-capacities-ukraine-cultural-heritage-first-aid-and-recovery-planning.
[18] Ismayilzada, M., Zhumadilova, A., Minazhova, S., Kaliyev, Z., & Myskovets, I. (2024). Environmental consequences of the Zaporizhzhya NPP situation. *International Journal of Environmental Studies*, 81(1), 151-158. doi: 10.1080/00207233.2023.2270307.
[19] Jonker, A. (2023). *What is a Geographic Information System (GIS)?* Retrieved from https://www.ibm.com/topics/geographic-information-system.
[20] Katona-Kovács, J., High, C., & Nemes, G. (2011). *Importance of animation actions in the operation of Hungarian local action groups.* Budapest: Institute of Economics of the Hungarian Academy of Sciences.
[21] Key Performance Indicators, KPI. (2024). Retrieved from https://www.it.ua/knowledge-base/technology-innovation/key-performance-indicators-kpi.
[22] Krawczyńska, D., Hadasik, B., Ryczko, A., Przedworska, K., & Kubiczek, J. (2024). Pursuing European green deal milestones in times of war in Ukraine – a context of energy transition in Poland. *Economics and Environment*, 88(1), article number 736. doi: 10.34659/eis.2024.88.1.736.
[23] Law of Ukraine No. 13 "On the Principles of State Regional Policy". (2015, February). Retrieved from https://zakon.rada.gov.ua/laws/show/en/156-19/sp:dark?lang=en#Text.
[24] Mosse, R., & Sontheimer, L.E. (1996). *Performance monitoring indicators handbook.* Washington: World Bank Group.
[25] National Intelligence Strategy. (2023). Retrieved from https://www.odni.gov/files/ODNI/documents/National_Intelligence_Strategy_2023.pdf.
[26] Ponomarenko, V., & Pysarchuk, O. (2024). Peculiarities of the impact of learning losses on the formation of human capital in Ukraine under martial law. *Economics of Development*, 23(1), 38-52. doi.: 10.57111/econ/1.2024.38.
[27] Regional development strategy: New challenges, plans and digital technologies. (2023). Retrieved from https://www.kmu.gov.ua/news/stratehiia-rehionalnoho-rozvytku-novi-vyklyky-plany-ta-tsyfrovi-tekhnolohii.
[28] Resolution No. 449 "On Approval of the Procedure for Monitoring the Provision and Evaluation of the Quality of Social Services". (2020, June). Retrieved from https://zakon.rada.gov.ua/laws/show/449-2020-%D0%BF#Text.

[29] Shao, Y., Sun, Y., & Zheng, Z. (2023). How do comprehensive territorial plans frame resilience? a content analysis of plans by major cities in China. *Sustainability*, 15(10), article number 7783. doi: 10.3390/su15107783.
[30] Shatz, H.J., Tarini, G., Ries, C.P., & Dobbins, J. (2022). *Reconstructing Ukraine creating a freer, more prosperous, and secure future.* Retrieved from https://www.rand.org/pubs/research_reports/RRA2200-1.html.
[31] Smits, K., *et al.* (2019). *Ukraine growth study final document: Faster, lasting and kinder.* Washington: World Bank Group.
[32] TANGO – Territorial Approaches for New Governance. (2013). Retrieved from https://www.espon.eu/programme/projects/espon-2013/applied-research/tango-territorial-approaches-new-governance.
[33] Téllez, A., Duran, L., Chmielewska, M., & Santos-Lacueva, R. (2022). Policy instruments for sustainable tourism management in national parks: A comparative analysis of Colombia, Costa Rica, and Spain. *Journal of Tourism Analysis*, 29(2), 41-79. doi: 10.53596/jta.v29i2.419.
[34] Trusova, N.V., Cherniavska, T.A., Pasieka, S.R., Hranovska, V.H., Prystemskyi, O.S., & Demko, V.S. (2020). Innovative clustering of the region in the context of increasing competitive positions of the enterprises of the tourist-recreational destination. *Geojournal of Tourism and Geosites*, 31(3), 1126-1134. doi: 10.30892/gtg.31326-549.
[35] U.S. Department of Commerce. (2023). *Best practices for monitoring and evaluating the ARP, IIJA and other programs: Report of the Department of Commerce data governance working group*. Retrieved from https://www.commerce.gov/sites/default/files/2023-08/DOC-Data-Governance-Working-Group-Report.pdf.
[36] *Ukraine common country analysis*. (2021). Kyiv: Resident Coordinator Office.
[37] Vasylchenko, G., Parasyuk, I., & Yeremenko, N. (2015). *Planning the development of territorial communities: Training manual for local government officials*. Kyiv: V&A Enterprise LLC.
[38] Verstraete, G. (2023). *5 Relevant macro-economic indicators to monitor in your forecasting process*. Retrieved from https://blog.solventuregroup.com/5-relevant-macro-economic-indicators-to-monitor-in-your-forecasting-process.
[39] Wessel, D., & Asdourian, E. (2022). *What lessons do past international efforts at rebuilding war-torn countries hold for organizing the reconstruction of Ukraine?* Retrieved from https://www.brookings.edu/articles/what-lessons-do-past-international-efforts-at-rebuilding-warn-torn-countries-hold-for-organizing-the-reconstruction-of-ukraine/.

Розробка механізмів моніторингу та оцінки ефективності системи управління комплексним відновленням територіальних громад

В'ячеслав Шебанін
Доктор технічних наук, ректор
Миколаївський національний аграрний університет
54000, вул. Георгія Гонгадзе, 9, м. Миколаїв, Україна
https://orcid.org/0000-0002-0391-396X
Олена Шебаніна
Доктор економічних наук, декан
Миколаївський національний аграрний університет
54000, вул. Георгія Гонгадзе, 9, м. Миколаїв, Україна
https://orcid.org/0000-0001-7663-5991
Ірина Кормишкіна
Кандидат економічних наук
Миколаївський національний аграрний університет
54000, вул. Георгія Гонгадзе, 9, м. Миколаїв, Україна
https://orcid.org/0000-0002-7883-8423
Георгій Решетілов
Кандидат економічних наук
Миколаївський національний аграрний університет
54000, вул. Георгія Гонгадзе, 9, м. Миколаїв, Україна
https://orcid.org/0000-0002-3691-7975
Юрій Кормишкін
Доктор економічних наук, професор
Миколаївський національний аграрний університет
54000, вул. Георгія Гонгадзе, 9, м. Миколаїв, Україна
https://orcid.org/0000-0002-1005-1229

Анотація. Метою дослідження було створення системи моніторингу та оцінки відновлення територіальних громад в Україні, що постраждали від збройного конфлікту. Було визначено ключові сфери моніторингу – економічну, соціальну, екологічну та управлінську. Економічні показники, такі як інвестиції та створення робочих місць, були визначені як метрики стабільності, тоді як соціальні показники, включаючи зайнятість та доступ до послуг, виявилися критично важливими для якості життя. Екологічні індикатори наголошували на скороченні викидів, підвищенні енергоефективності та використанні відновлюваних джерел енергії. Індикатори врядування підкреслили необхідність координації, участі та прозорості використання ресурсів. Головним досягненням стала розробка цифрової платформи, здатної збирати та аналізувати дані в режимі реального часу, автоматизуючи інтеграцію даних з різних джерел для візуалізованого оперативного аналізу. Платформа супроводжувалася дорожньою картою, яка окреслювала ключові етапи, від планування та інтеграції до тестування та повного впровадження, що забезпечило її ефективне розгортання в громадах. Було доведено, що такий системний підхід робить значний внесок у сталий розвиток, сприяючи ефективному використанню ресурсів, екологічній відповідальності та покращенню врядування. Результати дослідження підкреслили, що комплексна система моніторингу підтримує процеси відновлення, дозволяючи вчасно вносити корективи та забезпечуючи прозорість. Ці механізми були визнані необхідними для досягнення довгострокової стабільності та стійкості в регіонах, що постраждали від конфлікту. Результати дослідження підкреслюють вирішальну роль інтегрованих платформ і структурованих підходів у підвищенні ефективності зусиль з відновлення, а також у зміцненні довіри та співпраці між зацікавленими сторонами

Ключові слова: інструменти контролю; аналіз ефективності; адміністрування; місцеві асоціації; територіальні громади; система управління

SCIENTIFIC BULLETIN
OF MUKACHEVO STATE UNIVERSITY
SERIES "ECONOMICS"

Scientific Journal

Vol. 11, No. 4. 2024

Founded in 2014. Published four times per year

The original layout of the publication is made
in the publishing department of Mukachevo State University

Managing Editor:
A. Koniukh

Desktop publishing:
O. Glinchenko

Signed for print 27.12.2024.
Format 60*84/8
Conventional printed pages 18.8
Circulation 300 copies

Publishing Address:
Mukachevo State University
89600, 26 Uzhhorodska Str., Mukachevo, Ukraine
Tel.: +38 (03131) 21109
E-mail: info@economics-msu.com.ua
https://economics-msu.com.ua/en

НАУКОВИЙ ВІСНИК
МУКАЧІВСЬКОГО ДЕРЖАВНОГО УНІВЕРСИТЕТУ
СЕРІЯ «ЕКОНОМІКА»

Науковий журнал

Том 11, № 4. 2024

Заснований у 2014 р. Виходить чотири рази на рік

Оригінал-макет видання виготовлено
у редакційно-видавничому відділі Мукачівського державного університету

Відповідальний редактор:
А. Конюх

Комп'ютерна верстка:
О. Глінченко

Підписано до друку 27.12.2024 р.
Формат 60*84/8
Умовн. друк. арк. 18,8
Наклад 300 примірників

Адреса видавництва:
Мукачівський державний університет
89600, вул. Ужгородська, 26, м. Мукачево, Україна
Тел.: +38 (03131) 21109
E-mail: info@economics-msu.com.ua
https://economics-msu.com.ua/uk

МУКАЧІВСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ

89600, м. Мукачево, вул. Ужгородська, 26
тел./факс +380-3131-21109
Веб-сайт університету: www.msu.edu.ua
E-mail: info@msu.edu.ua, pr@mail.msu.edu.ua
Веб-сайт Інституційного репозитарію Наукової бібліотеки МДУ: http://dspace.msu.edu.ua:8080
Веб-сайт Наукової бібліотеки МДУ: http://msu.edu.ua/library/