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імені В. Н. КАРАЗІНА

# ФІНАНСОВО-КРЕДИТНІ СИСТЕМИ: ПЕРСПЕКТИВИ РОЗВИТКУ

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# FINANCIAL AND CREDIT SYSTEMS: PROSPECTS FOR DEVELOPMENT

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# Banks of the present and the future

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## Assessing the ecosystem readiness for AI adoption in Uzbekistan's banking sector: a multi-stakeholder perspective

***Abstract.*** Artificial Intelligence (AI) is increasingly a revolutionary force in global banking, although its use in emerging economies like Uzbekistan is less documented. The banking sector in Uzbekistan is made up of a mix of state and foreign banks in a transitional digital setting.

**Problem Statement.** Despite government-led efforts at the digitalization of the economy, little is known about the readiness of the banks of Uzbekistan for the adoption of AI technologies, or the strategic priority of such adoptions by different types of banks.

**Unresolved aspects of the problem.** Existing literature predominantly focuses on AI readiness at the macroeconomic level without specific details regarding the sectoral adoption processes. Empirical analysis integrating digital infrastructure, institutional readiness, and workforce competencies within the case of Uzbekistan's banking is also nonexistent.

**Purpose of the Article.** This research seeks to evaluate the AI adoption environment in the banking industry of Uzbekistan through the integration of various data sources in order to assess regulatory, technological, and human capital preparedness, along with visible implementation trends.

**Presentation of the Main Material.** The approach adopts a multi-source exploratory method, including Oxford Insights AI Readiness Index (2024) research, web scraping of bank websites for AI disclosures, and investigating labor market activity on platforms like Telegram, LinkedIn for AI-skilled personnel presence. The use of Playwright and BeautifulSoup in a Google Colab environment enabled successful keyword-based surveillance of publicly available AI-related projects**.**

**Conclusions.** The results indicate a split landscape: state banks focus on back-office automation while foreign banks are more likely to experiment with customer-facing AI solutions. With national digital agendas still unfolding, AI talent shortages, infrastructural limitations, and relative opaqueness persist. Based on this evidence, policy suggestions for AI planning and banking innovation in developing economies are presented.

***Keywords:*** *Artificial intelligence, banking in Uzbekistan, AI adoption, financial services, central bank*
**JEL:** G21, O33, F63

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**Introduction.** The opportunities of technological developments which have proven their economic perspective are the focus of great research by the scholars, governments, and financial institutions. Artificial intelligence has become one of the most prominent technologies in this field and is now recognised as one of the key drivers of innovation, disrupting many industries and reshaping decision-making mechanisms(Bahoo et al., 2023; Milana & Ashta, 2021). Among these, artificial intelligence has become a prominent technology, serving as a key driver of innovation in recent years, revolutionizing various industries and transforming decision-making processes (Bahoo et al., 2023; Milana & Ashta, 2021). According to (Polireddi, 2024) total value of gains from implementation of AI in international banking is around $1 trillion each year. A McKinsey report finds that global spending on artificial intelligence could reach approximately USD 450 billion by 2027, with the banking sector contributing about 13% of this amount (Bughin et al., 2017). The rising adoption of AI technologies in finance can be explained by the fierce rivalry within the sector (Kruse et al., 2019). These figures are prompting regulators to proactively respond to the use of artificial intelligence in highly regulated financial markets. Policymakers from the U.S. to Asia are actively developing AI initiatives and regulatory sandboxes to promote responsible innovation while ensuring compliance with ethical and legal standards (Uren & Edwards, 2023).

The Uzbekistan government's commitment to establishing an AI friendly environment is evident in its legislative efforts. Digital Uzbekistan-2030 strategy emphasizes to create proper infrastructure and legislation for further development artificial intelligence. In April 2025 the Oliy Majlis Legislative Chamber voted to pass a bill to govern AI and provide further safeguards for personal data, instituting legal liability for abusing personal information and noting down national policy guidelines for AI development.(*First AI Bill Reaches Uzbekistan Parliament*, n.d.)

While the Central Bank of Uzbekistan has not yet issued any directives on the use of artificial intelligence, it is utilizing AI-driven models such as ARIMA and Bayesian Vector Autoregression (BVAR). Additionally, Quarterly Projection Models (QPM) support medium-term forecasting. Moreover, the bank has announced further plans to enhance inflation assessment through e-CPI models and expand short-term forecasting techniques(Key Directions of Monetary and Credit Policy for the Period of 2024 and 2025–2026. , n.d.).

In the private sector, TBC Uzbekistan is a pioneer in proactive AI implementation in banking. The bank has developed own Uzbek language models and used AI agents for loan payment reminder purposes, which have resulted in incredible gains in operating efficiency and customer service. These improvements indicate the possible value of AI integration in banking operations.

This research applies a multi-method approach to capture the recent evolution of AI technologies in the banking industry of Uzbekistan. The outline of this paper includes: an introduction with a theoretical overview, detailed methodology including software employed, analysis of data, presentation and discussion of findings, articulation of contributions made to scholarship on the topic, and final reflections summarizing the outcomes while highlighting policy recommendations alongside outlining research limits and identifying avenues for further exploration.

This study establishes a synthesis based on integrated macro-level metrics and micro-level institutional information to present how AI is utilized within the emerging market’s financial system as methodically structured and empirically grounded.

**Literature review.** Addressing AI challenges and adoption in banking looks at the technology along with human factors, solving infrastructure issues which requires big finances, privacy issues regarding data, algorithmic biases, gaps in skills of employees and especially lengthy time-to-market for new products or services in highly regulated banking sector, adherence to laws and regulations among others (Crews, 2019; Fares et al., 2023; Lazo & Ebardo, 2023).

(Ikhsan et al., 2025) investigated the determinants of artificial intelligence (AI) adoption and continuance in the banking sector of Indonesia from the customer's point of view using an extended Technology Acceptance Model. The study asked whether awareness of AI, subjective norms, perceived risk, and perceived trust significantly affect users' attitudes, behavioral intentions, and continuance intentions. They discovered that customers perceived usefulness and ease of use positively influence attitudes toward AI, while perceived risk has a negative influence. Most notably, trust moderated the perceived risk and ongoing AI use relationship, demonstrating its essential role in alleviating customers' fears.

(Pramanik et al., 2024) conducted a study to identify the key enablers of artificial intelligence (AI) readiness across developed and developing economies. Employing machine learning approaches, specifically XGBoost regression and explainable AI platforms, researchers developed models on data from 20 developed and 20 developing countries, utilizing sources such as the World Bank, United Nations, and Stanford-Human-Centered AI data repositories. They then tested 33 AI readiness determinants in organizations in these nations. The study sets out to determine whether AI readiness in developing nations is more certain than that of developed nations. Three determinants—scientific research output, internet infrastructure, and public consumption expenditure—were identified as universal and equally efficient in both sets. These findings are essential for monitoring and enabling the AI ecosystem towards enhanced digital transformation.

Reem Al-Araj and her colleagues examined the impact of artificial intelligence (AI) on bank service quality and customer satisfaction in the Jordanian banking sector. The research aimed to answer two fundamental questions: the degree to which AI use has transformed bank service quality, and the degree to which AI use has transformed customer satisfaction. Through their analysis, they found that AI significantly enhances the quality of service, particularly in reliability, responsiveness, and assurance. Nevertheless, its effect on customer satisfaction, albeit positive, was comparatively weaker. Authors emphasized the need to strike a balance between human and AI technologies since customers still value being treated as individuals. They concluded that although AI enhances the efficiency of operations and service, customer satisfaction is suboptimal, which implies there is still a requirement to fit in more to customer expectations (Al-Araj et al., 2022).

A research team from Malaysia investigated the key elements and issues impacting the use of artificial intelligence (AI) technology in the banking industry in Malaysia. In the mixed-methods study, the study was conducted through interviews of bank officials complemented by customer questionnaires. Qualitative findings showed that AI plays a crucial role in fraud detection and risk avoidance, but its deployment is hampered by regulatory loopholes, data privacy concerns, and inadequate infrastructure. Quantitative results showed attitudes, perceived usefulness, trust, risk, and social influence have a significant impact on customers' adoption intention of AI while ease of use and awareness do not (Rahman et al., 2023).

Indian scholars have also examined the adoption of artificial intelligence in India's financial services sector. For instance, (Fatima & Chakraborty, 2024) employed the Technology Acceptance Model (TAM) to examine the acceptance of robo-advisors to make investment decisions. The study revealed that trust, anxiety, performance expectancy, and preference for human advisors all significantly influence behavioural intention. Taking into account moderating variables such as age, gender, and investment knowledge, the study confirmed that trust, anxiety, and human consultant preference are particularly predominant factors for young investors. For older investors above the age of 45, on the other hand, anxiety was the predominant driver of adoption. Furthermore, anxiety was identified as having strong influence on behaviour intention among both male and female respondents. Interestingly enough, the study also showed that for individuals with sound investment knowledge, stress had a negative relation with the inclination to utilize robo-advisory services.

Scholars have also discussed the adoption of AI from an organizational point of view. In the latest study by (Tursunbayeva & Chalutz-Ben Gal, 2024), a pragmatic check list anchored on the Technology-Organization-People (TOP) framework is presented to guide digital leaders in

managing the complexities of AI deployment. Based on extensive literature and industry knowledge, the framework enables organizations to assess key factors through three primary dimensions—technology, organizational readiness, and people. By systematic examination of these industries, the framework enhances the prospects of successful AI integration and allows organizations to realize strategic leverage in the digitizing economy.

In summary, it is proposed by literature that the most influential factors for AI adoption in the financial industry in nations such as trust, perceived usefulness, risk, infrastructure, and regulatory clarity. While organizational preparedness and customer behavior have been widely studied using models such as TAM and the TOP framework, with most studies being of mature and emerging markets such as Indonesia, India, Malaysia, and Jordan.

Although many people agree that AI can be used to improve customer services, help detect or prevent fraud, and improve the accuracy of credit-rating (Abdurashidova & Balbaa, 2023), numerous barriers still exist, such as limited talent in AI-based fields, unclear regulatory frameworks, and the data-security issue. There are few empirical studies investigating consumer attitudes, organisations readiness and sector-level adoption drivers in Uzbekistan. Since the context-specific evidence is scarce, further investigations are needed to support and guide the AI-facilitated banking sector transformation in Uzbekistan. In addition, it is firmly believed that governments, research institutions, and investment institutions nowadays focus extensively on technological changes that have massive economic reward potential, and AI is a major innovation driver and one that transforms decision making in a very broad range of fields of activity.

**Purpose, objectives and research methods.**

*Research Design*

This study uses an exploratory qualitative approach to examine how Artificial Intelligence (AI) is being adopted in Uzbekistan's banking sector. Given that AI in banking is still a rather new development, especially in the context of emerging economies, combining web data and broader institutional analysis gives a more accurate representation of what's happening on the ground.

To place this in a national perspective, research employs the Oxford Insights Government AI Readiness Index 2024, which ranks nations according to how ready they are to embrace AI in public services. Through the incorporation of this index, the research bridges what is happening in banks to the general AI climate and institutional capability of Uzbekistan.

*Data collection*

Primary data were collected by systematically scanning the websites of all Uzbekistan's commercial banks, state-owned as well as private and foreign banks operating in the country. To search for announcements or notifications on AI projects, the scraper focused on news, press releases, and media sections of each website. In order to obtain additional depth, we also examined major financial news websites covering the banking sector.

Web scraping software is also used to retrieve data from bank websites, specific financial news websites and messenger platforms. Web scraping is an essential software for extracting information from websites, and when it comes to bank websites, the process involves incorporation of programming languages and special tools. The technical part of this assignment utilized Playwright, a new Python library particularly suitable for handling dynamic websites. We used AI-related search terms in Uzbek, Russian, and English—for example, "sun'iy intellekt", "искусственный интеллект", "чат-бот", and "AI"—to help filter relevant materials. Python, using libraries such as Playwright and BeautifulSoup, is widely used for web scraping as it is simple, flexible, and has extensive support for data extraction operations (Tanasa et al., 2024). Python with BeautifulSoup and Playwright used to run code in Google Colab environment. In addition, we used LinkedIn/headhunder search analysis to identify AI-skilled workers working in Uzbek banks, incorporating additional labor market signals into the dataset.

At the same time, we also looked at Uzbekistan's ranking in the Oxford Insights Government AI Readiness Index 2024 to find out how ready the country is overall to adopt AI. This helped to see if whatever is happening in banks fits into the country's larger AI growth narrative.

The Oxford Insights Government AI Readiness Index 2024 is the first of its kind report that presents a structured approach to evaluating the government preparedness to engage artificial intelligence (AI) in the course of operations of the national government. The index is based on ranking of 188 countries using 40 indicators that are condensed into three major pillars; Government, Technology Sector and Data & Infrastructure. Every pillar deals with a unique AI readiness dimension, including institutional and regulatory systems, technological maturity, and access and quality of data facilities and supportive ecosystems. The indicators have normal distribution and are combined to form an aggregate score to determine the relative position of a country that is scaleable between 0-100 as an index of readiness of an AI. Besides facilitating international comparison, the index provides policymakers with a structured method of identifying national gaps and advantages and assigning individual solutions that point to the inclusive and successful adoption of AI(Government AI Readiness Index 2024, n.d.).

Prominent AI index reports, such as Stanford University's AI Index and the International Monetary Fund’s AI Readiness Index, do not include any data on Uzbekistan. The Stanford report primarily assesses sector-specific developments rather than ranking national governments, while the IMF’s index, based on 2023 data, does not provide information on Uzbekistan for that period. The OECD AI Observatory, another reputable source among AI index reports, offers only limited information on Uzbekistan. Its coverage primarily focuses on AI governance, specifically laws and regulations, with just three documented cases.

*Data Analysis*

We analyzed the data using qualitative content analysis (Mayring, 2015), meaning that we read closely through things we collected for patterns in the adoption of AI. We paid close attention to the types of AI technology banks were using—like chatbots, fraud detection, customer service tools, and call center automation.

By combining the AI Readiness Index with these findings, it was possible to compare what is actually happening in the banking sector with Uzbekistan's national readiness for AI. This enabled us to assess if banks are leading or lagging national trends.

*Limitations*

This research was mostly based on what is already available on the internet, and hence may be projects at banks that have not yet been made public. Also, since we have used keyword search, we might have missed articles where AI was used as part of other words or phrases. Furthermore, keyword-based crawling may miss AI-related content articulated differently or contained within less crawlable formats or if websites are strongly protected against parsing and scrapping.

For further research, banking manager interviews or survey data may reveal more of both above-board and behind-the-scenes work involving AI.

**Research results.** According to the Government AI Readiness Index 2024 published by The Oxford Insights, Uzbekistan showed high scores in government institution (64.7) and data and infrastructure (62.1) but relatively lower scores (33.5) in the field of technology. In live scores, it is proposed that Uzbekistan scored the full-scale of 100 in the sub-category called Vision and were above the global averages in the second category called Governance and Ethics by formulating a regulatory framework. Such high scores were also recorded in the area of Data Availability (84.1).

*Table 1. Uzbekistan’s AI Readiness Index.*

| **Dimension** | **Score** | **Remarks** |
|---|---|---|
| Government Institutions | 64.7 | Strong policy/governance infrastructure |
| Technology Sector | 33.5 | Lower performance-needs greater investment |
| Data & Infrastructure | 62.1 | Solid performance, especially in data provision |
| Vision | 100 | Excellent—national strategy in place |
| Governance & Ethics | 58.6 | Above global average—focus on regulatory frameworks |
| Data Availability | 84.1 | Highly prioritized—emphasis on open data accessibility |

*Source: Oxford Insights 2024*

The table demonstrates a consistent growth in the AI preparedness of Uzbekistan, as both the overall points reached 58.57 (2024) which is higher than in 2022 (44.51) and the nation ranks lower compared to the previous year, 70 position instead of 79. This trajectory shows more resilient institutional structures and high investments in data infrastructure as the uptick experienced is quite steep, 29.4-62.1. However, the weakest pillar still rests in the technology field and thus it must be invested more in and worked on. The Uzbekistan is ranked 70th of 188 countries in Index rankings, 17 places higher than the previous year, and ranks top of countries in Central Asia, and third in South and Central Asia after India and Turkey.

*Table 2. Uzbekistan's global ranking for past three years.*

| Year | Total Score | Global Ranking | Government Institutions | Technology Sector | Data & Infrastructure |
|---|---|---|---|---|---|
| 2022 | 44.51 | 79th of 181 | 57.8 | 22.4 | 29.24 |
| 2023 | 43.79 | 89th of 193 | 60.4 | 28.7 | 56.3 |
| 2024 | 58.57 | 70th of 188 | 64.7 | 33.5 | 62.1 |

*Source: Oxford Insights 2024*

In order to understand the place of Uzbekistan in the 2024 Oxford Insights Government AI Readiness Index, it is critical to consider the place of the country as a whole in the context of digitalization. The strategy, the government introduced and called Digital Uzbekistan - 2030 strategy, is a cross-sector action plan to transform the public administration, financial services and governance to digital. Also, establishment of the Scientific Research Institute for the Development of Digital Technologies and Artificial Intelligence under the Ministry of Digital Technologies which is responsible for taking national-level AI research coordination, standardization, and development of AI policy is clear evidence of national digitization strategy. It is evident that the key element of successful AI adoption is the presence of national AI strategies reinforced with more robust governance frameworks. (Xu et al., 2024) conducted a comparative analysis in Asia and discovered that good policy frameworks, infrastructure investment, and interinstitutional collaboration are significant in AI preparation and morally inclined use. Similarly, (Gao & Zhang, 2024) argue that the future of global AI governance will depend on the balance of innovation and regulatory architecture, prospective capacity-building, and multi-stakeholder convergence, confirming the Uzbekistan case in applying evidence and similarities to the accounts of AI-related countries at the forefront. These results supplement the work by (Birkstedt et al., 2023) that claims that governance of AI should be ethical and strategic by requiring policy frame with integrative rule systems, standard practices and coordination. Also pertinent is the systematic review of (Madan & Ashok, 2023) on diffusion of AI in public administration mentioning the importance of valid organizational-environmental models and absorptive capacity emphasising the fact that there is the readiness gap that is needed to fund organizational mechanisms so as to put things in work.

An extensive web-scraping research on the websites of the financial institutions established in Uzbekistan has shown that many banks whether state-owned or privately owned are doing a lot of work by implementing artificial intelligence (AI) in their working models. The results, which have been listed in the table below, show that SQB (Uzbek Industrial and Construction Bank) has implemented AI-assisted tools that allow analysing the customer transactions. A foreign-owned company TBC Bank has also applied the chatbot functionalities in the mobile application business operating on the Uzbek language being able to enhance the engagement between the customers and the business. Ipoteka bank has also incorporated the AI powered solutions in its call-centre setup to have successful interaction with their customers.

*Table 3. Overview of AI Adoption Status per Bank in Uzbekistan.*

| Bank Name | Ownership | AI use case | Year | Language |
|---|---|---|---|---|
| Sanoatqurilishbank | State-owned | Fraud detection | 2025 | Uzbek |
| Ipotekabank | State-owned | Customer experience | 2025 | Russian |
| TBC bank Uzbekistan | Foreign | Customer experience | 2025 | Russian |
| Aloqabank | State-owned | AI Video analytics, credit scoring | 2024 | Russian |
| Hamkorbank | Private | ML specialist in Linkeding | 2024 | Russian |
| Asakabank | State-owned | AI functions of mobile app | 2025 | Russian |
| Infinbank | Private | AI skilled roles in Linkedin | 2025 | Russian |
| Avo Bank | Private | AI skilled roles in Telegram | 2025 | Russian |
| Anorbank | Private | AI skilled roles in Telegram | 2025 | Russian |

*Source: Processed data*

The evidence from this study suggests that AI adoption in Uzbekistan's financial sector is in its infancy but remains uneven. The state banks are cautiously experimenting with AI in internal process automation, whereas the foreign banks, like TBC, are likely to be more inclined to make investments in customer-facing AI solutions, possibly leveraging know-how from their parent organizations or group operations.

*Table 4.Frequency of AI-related Keywords Found During Scraping.*

| Keyword | Total mentions | No. of Banks with Mentions | Pages identified |
|---|---|---|---|
| Чат-бот | 0 | 0 | 0 |
| Исскуственный интеллект | 2 | 2 | 2 |
| sun’iy intellekt | 2 | 1 | 3 |
| Нейросеть | 0 | 0 | 0 |
| сунъий интеллект | 2 | 2 | 2 |

*Source: Processed data*

**Discussion.** This variation reflects two significant trends in AI adoption among emerging economies:

- State-owned banks prefer focusing on operational effectiveness, using AI to automate back-office processes such as risk assessment, transaction tracking, or call center operations.
- Private or offshore banks with digitally-oriented business models prefer focusing on customer engagement tools such as chatbots and personalized mobile interfaces.

Of particular interest is that Uzbekistan's comparatively balanced position in the Oxford Insights Index goes some way towards explaining some of the challenges faced by local banks, including shortages of competent AI experts, insufficient supply of scalable computing infrastructure, and rough policy arrangements to support sophisticated AI deployment.

The web scraping approach used in this research revealed silences in public disclosure of ongoing AI advancements. Certain banks may already pilot test AI technology internally but not necessarily disclose such initiatives yet. Moreover, the lack of Uzbek-language NLP tools could further postpone the introduction of chatbot or voice assistant technology, even as digital banking customers increasingly expect it.

Commenting on emerging markets, former research shows the use of AI technology in banking in rather an expanding dimension correlates with the two-fold pattern noticed in this work. For example, (Shaikh et al., 2024) has depicted how Indian banks using AI for customer relations received growth in satisfaction and procedure efficiency while being attended to by people, reinforcing the notion that there exists supporting relationship between AI and human roles.

(Noreen et al., 2023) points out two spheres where AI utilization is concentrated – internal functions: frauds and analytics as well as externally via chatbots and personalization servicing – which seem to correspond with the division between domestic and foreign banks operating in Uzbekistan.

Additionally, LinkedIn-based research of personnel profiles offered indispensable supporting evidence. Professionals claiming proficiency in artificial intelligence and machine learning were found to be working for Infinbank, Asakabank, Avobank, and Hamkorbank. The fact that these banks do not yet have public declarations on the adoption of AI formally does not preclude their internal capacity building towards possible AI integration in the future. This pattern is consistent with prior research that emphasizes the lag between internal capacity building and formal announcements or visible project launches in developing economies (Bughin et al., 2017; Marwala & Hurwitz, 2017).

The report suggests that the institutional readiness of Uzbekistan to implement AI and the technological application of AI in the banking industry is gradually converging, albeit the adoption rate is currently growing slowly. The next step will depend on three factors related to each other:

• Development of Policy around AI-enabled innovation within the financial sector;

• Developing local AI expertise;

And the growth of the public-private partnerships to provide scaleable, safe AI solutions.

Methodologically, the research is based on the multi-source data that can encompass both the official websites and international indices as well as the labour-market platforms and thus can enable an in-depth evaluation of the intricate dynamics of digitalization in emerging markets. An exclusive focus on formal reporting or announcements would have made the estimate of AI adoption in Uzbekistan banking sector much narrower.

Overall, the results put the banking sector in the country at an AI adoption stage characterized by preparatory efforts, a few visible deployments in the community, continuous capacity building internally, and gradual organizational readiness. Constant monitoring and long term projections will be necessary to establish how these pioneering attempts end up turning into sectorial transformation in the long run.

**Conclusions.** The research examined the process of adopting AI by the banking sector in Uzbekistan, which followed a multi-method methodology integrating web-scraping data, global readiness indicators and labour-market statistics. The findings show that, although AI adoption by the banks of Uzbekistan is in its early stages, a number of developments have been witnessed. A pattern of internal capacity building is seen, with the emergence of AI-skilled individuals in some of the best-known institutions, though they have not provided much information publicly. These results align with the intermediate score of Uzbekistan regarding the Oxford Insights Government AI Readiness Index (2024) that proves that, despite the institutional progress of adaptation, there is much to overcome. Examples of such challenges are structural gaps in regulatory framework, digital infrastructure, institutional support, among others.

**References**

1. Abdurashidova, M. S., & Balbaa, M. E. (2023). Artificial Intelligence in the Banking Sector in Uzbekistan: Exploring the Impacts and Opportunities. *Proceedings of the 7th International Conference on Future Networks and Distributed Systems*, 51–57. https://doi.org/10.1145/3644713.3644721
2. Al-Araj, R., Haddad, H., Shehadeh, M., Hasan, E., & Nawaiseh, M. Y. (2022). The Effect of Artificial Intelligence on Service Quality and Customer Satisfaction in Jordanian Banking Sector. *WSEAS TRANSACTIONS ON BUSINESS AND ECONOMICS*, *19*, 1929–1947. https://doi.org/10.37394/23207.2022.19.173
3. Bahoo, S., Cucculelli, M., & Qamar, D. (2023). Artificial intelligence and corporate innovation: A review and research agenda. *Technological Forecasting and Social Change*, *188*, 122264. https://doi.org/10.1016/j.techfore.2022.122264
4. Birkstedt, T., Minkkinen, M., Tandon, A., & Mäntymäki, M. (2023). AI governance: themes, knowledge gaps and future agendas. *Internet Research*, *33*(7), 133–167. https://doi.org/10.1108/INTR-01-2022-0042
5. Bughin, J., Hazan, E., Ramaswamy, S., Chui, M., Allas, T., Dahlström, P., Henke, N., & Trench, M. (2017). *ARTIFICIAL INTELLIGENCE THE NEXT DIGITAL FRONTIER?* Retrieved from: https://www.mckinsey.com/~/media/mckinsey/featured%20insights/artificial%20intelligence/notes%20from%20the%20frontier%20modeling%20the%20impact%20of%20ai%20on%20the%20world%20economy/mgi-notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy-september-2018.pdf

6. Crews, C. (2019). What Machine Learning Can Learn from Foresight: A Human-Centered Approach. *Research-Technology Management*, *62*(1), 30–33. https://doi.org/10.1080/08956308.2019.1541725
7. Fares, O. H., Butt, I., & Lee, S. H. M. (2023). Utilization of artificial intelligence in the banking sector: a systematic literature review. *Journal of Financial Services Marketing*, *28*(4), 835–852. https://doi.org/10.1057/s41264-022-00176-7
8. Fatima, S., & Chakraborty, M. (2024). Adoption of artificial intelligence in financial services: The case of robo-advisors in India. *IIMB Management Review*, *36*(2), 113–125. https://doi.org/10.1016/j.iimb.2024.04.002
9. *First AI bill reaches Uzbekistan parliament*. (n.d.). Dentons. Retrieved from: https://www.dentons.com/en/insights/articles/2025/may/6/first-ai-bill-reaches-uzbekistan-parliament
10. Gao, Q., & Zhang, J. (2024). *The Future of Global Governance of Artificial Intelligence* (pp. 53–95). https://doi.org/10.1007/978-981-99-9211-9_3
11. *Government AI Readiness Index 2024*. (n.d.). Retrieved from https://oxfordinsights.com/wp-content/uploads/2024/12/2024-Government-AI-Readiness-Index-2.pdf
12. Ikhsan, R. B., Fernando, Y., Prabowo, H., Yuniarty, Gui, A., & Kuncoro, E. A. (2025). An empirical study on the use of artificial intelligence in the banking sector of Indonesia by extending the TAM model and the moderating effect of perceived trust. *Digital Business*, *5*(1), 100103. https://doi.org/10.1016/j.digbus.2024.100103
13. *Key directions of monetary and credit policy for the period of 2024 and 2025–2026.* . (n.d.). Retrieved from https://cbu.uz/upload/medialibrary/51f/wnliwwq12skjw4tnbb78b4rmiztk04bw/Asosiy_yunalishlar_31.10.2023_loyikha.pdf
14. Kruse, L., Wunderlich, N., & Beck, R. (2019). *Artificial Intelligence for the Financial Services Industry: What Challenges Organizations to Succeed*. https://doi.org/10.24251/HICSS.2019.770
15. Lazo, M., & Ebardo, R. (2023). Artificial Intelligence Adoption in the Banking Industry: Current State and Future Prospect. *Journal of Innovation Management*, *11*(3), 54–74. https://doi.org/10.24840/2183-0606_011.003_0003
16. Madan, R., & Ashok, M. (2023). AI adoption and diffusion in public administration: A systematic literature review and future research agenda. *Government Information Quarterly*, *40*(1), 101774. https://doi.org/10.1016/j.giq.2022.101774
17. Marwala, T., & Hurwitz, E. (2017). *Artificial Intelligence and Economic Theory: Skynet in the Market*. Springer International Publishing. https://doi.org/10.1007/978-3-319-66104-9
18. Mayring, P. (2015). *Qualitative Content Analysis: Theoretical Background and Procedures* (pp. 365–380). https://doi.org/10.1007/978-94-017-9181-6_13
19. Milana, C., & Ashta, A. (2021). Artificial intelligence techniques in finance and financial markets: A survey of the literature. *Strategic Change*, *30*(3), 189–209. https://doi.org/10.1002/jsc.2403
20. Noreen, U., Shafique, A., Ahmed, Z., & Ashfaq, M. (2023). Banking 4.0: Artificial Intelligence (AI) in Banking Industry & Consumer's Perspective. *Sustainability*, *15*(4), 3682. https://doi.org/10.3390/su15043682
21. Polireddi, N. S. A. (2024). An effective role of artificial intelligence and machine learning in banking sector. *Measurement: Sensors*, *33*, 101135. https://doi.org/10.1016/j.measen.2024.101135
22. Pramanik, P., Jana, R. K., & Ghosh, I. (2024). AI readiness enablers in developed and developing economies: Findings from the XGBoost regression and explainable AI framework. *Technological Forecasting and Social Change*, *205*, 123482. https://doi.org/10.1016/j.techfore.2024.123482
23. Rahman, M., Ming, T. H., Baigh, T. A., & Sarker, M. (2023). Adoption of artificial intelligence in banking services: an empirical analysis. *International Journal of Emerging Markets*, *18*(10), 4270–4300. https://doi.org/10.1108/IJOEM-06-2020-0724
24. Shaikh, A. A., Kumar, A., Mishra, A., & Elahi, Y. A. (2024). A study of customer satisfaction in using banking services through Artificial Intelligence (AI) in India. *Public Administration and Policy*, *27*(2), 167–181. https://doi.org/10.1108/PAP-05-2023-0060
25. Tanasa, A.-M., Oprea, S.-V., & Bara, A. (2024). Web Scraping and Review Analytics. Extracting Insights from Commercial Data. *Ovidius University Annals. Economic Sciences Series*, *23*(2), 370–379. https://doi.org/10.61801/OUAESS.2023.2.45
26. Tursunbayeva, A., & Chalutz-Ben Gal, H. (2024). Adoption of artificial intelligence: A TOP framework-based checklist for digital leaders. *Business Horizons*, *67*(4), 357–368. https://doi.org/10.1016/j.bushor.2024.04.006
27. Uren, V., & Edwards, J. S. (2023). Technology readiness and the organizational journey towards AI adoption: An empirical study. *International Journal of Information Management*, *68*, 102588. https://doi.org/10.1016/j.ijinfomgt.2022.102588
28. Xu, J., Lee, T., & Goggin, G. (2024). AI governance in Asia: policies, praxis and approaches. *Communication Research and Practice*, *10*(3), 275–287. https://doi.org/10.1080/22041451.2024.2391204

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**Оцінка готовності екосистеми до впровадження штучного інтелекту в банківському секторі Узбекистану: перспектива багатьох зацікавлених сторін**

***Анотація.*** Штучний інтелект (ШІ) дедалі більше стає революційною силою в глобальному банківському секторі, хоча його використання в країнах, що розвиваються, таких як Узбекистан, менш документоване. Банківський сектор Узбекистану складається з комбінації державних і іноземних банків у перехідному цифровому середовищі.

**Постановка проблеми.** Незважаючи на зусилля уряду щодо цифровізації економіки, мало відомо про готовність банків Узбекистану до впровадження технологій ШІ або про стратегічні пріоритети такого впровадження різними типами банків.

**Нерозв'язані аспекти проблеми.** Існуюча література переважно зосереджена на готовності до ШІ на макроекономічному рівні без детального розгляду процесів впровадження на секторальному рівні. Емпіричний аналіз, який інтегрує цифрову інфраструктуру, інституційну готовність та компетенції робочої сили в контексті банківського сектору Узбекистану, також відсутній.

**Мета статті.** Це дослідження має на меті оцінити середовище для впровадження ШІ в банківській індустрії Узбекистану шляхом інтеграції різних джерел даних для оцінки регуляторної, технологічної та людської капітальної готовності, а також видимих тенденцій впровадження.

**Виклад основного матеріалу.** Підхід базується на багато джерельному дослідницькому методі, включаючи дослідження Індексу готовності до ШІ від Oxford Insights (2024), веб-скрейпінг вебсайтів банків для виявлення інформації про ШІ, а також аналіз активності на ринку праці на платформах, таких як Telegram і LinkedIn, щодо наявності персоналу з навичками ШІ. Використання Playwright і BeautifulSoup у середовищі Google Colab дозволило успішно проводити моніторинг на основі ключових слів публічно доступних проєктів, пов'язаних із ШІ.

**Висновки.** Результати вказують на роздвоєний ландшафт: державні банки зосереджені на автоматизації внутрішніх процесів, тоді як іноземні банки більш схильні експериментувати з клієнтоорієнтованими рішеннями ШІ. Оскільки національні цифрові стратегії ще розвиваються, зберігаються нестача талантів у сфері ШІ, інфраструктурні обмеження та відносна непрозорість. На основі цих даних пропонуються рекомендації щодо політики планування ШІ та банківських інновацій у країнах, що розвиваються.

***Ключові слова:*** *Штучний інтелект, банківська справа в Узбекистані, впровадження ШІ, фінансові послуги, центральний банк.*

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**Список літератури**

1. Abdurashidova M. S., Balbaa M. E. Artificial Intelligence in the Banking Sector in Uzbekistan: Exploring the Impacts and Opportunities. *Proceedings of the 7th International Conference on Future Networks and Distributed Systems*. 2023. P. 51–57. https://doi.org/10.1145/3644713.3644721.
2. Al-Araj R., Haddad H., Shehadeh M., Hasan E., Nawaiseh M. Y. The Effect of Artificial Intelligence on Service Quality and Customer Satisfaction in Jordanian Banking Sector. *WSEAS Transactions on Business and Economics*. 2022. Vol. 19. P. 1929–1947. https://doi.org/10.37394/23207.2022.19.173.
3. Bahoo S., Cucculelli M., Qamar D. Artificial intelligence and corporate innovation: A review and research agenda. *Technological Forecasting and Social Change*. 2023. Vol. 188. 122264. https://doi.org/10.1016/j.techfore.2022.122264.
4. Birkstedt T., Minkkinen M., Tandon A., Mäntymäki M. AI governance: themes, knowledge gaps and future agendas. *Internet Research*. 2023. Vol. 33, No. 7. P. 133–167. https://doi.org/10.1108/INTR-01-2022-0042.
5. Bughin J., Hazan E., Ramaswamy S., Chui M., Allas T., Dahlström P., Henke N., Trench M. Artificial Intelligence: The Next Digital Frontier? McKinsey Global Institute. 2017. URL: https://www.mckinsey.com/~/media/mckinsey/featured%20insights/artificial%20intelligence/notes%20from%20the%20frontier%20modeling%20the%20impact%20of%20ai%20on%20the%20world%20economy/mgi-notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy-september-2018.pdf.
6. Crews C. What Machine Learning Can Learn from Foresight: A Human-Centered Approach. *Research-Technology Management*. 2019. Vol. 62, No. 1. P. 30–33. https://doi.org/10.1080/08956308.2019.1541725.
7. Fares O. H., Butt I., Lee S. H. M. Utilization of artificial intelligence in the banking sector: a systematic literature review. *Journal of Financial Services Marketing*. 2023. Vol. 28, No. 4. P. 835–852. https://doi.org/10.1057/s41264-022-00176-7.

8. Fatima S., Chakraborty M. Adoption of artificial intelligence in financial services: The case of robo-advisors in India. *IIMB Management Review*. 2024. Vol. 36, No. 2. P. 113–125. https://doi.org/10.1016/j.iimb.2024.04.002.
9. First AI bill reaches Uzbekistan parliament. Dentons. 2025. URL: https://www.dentons.com/en/insights/articles/2025/may/6/first-ai-bill-reaches-uzbekistan-parliament.
10. Gao Q., Zhang J. The Future of Global Governance of Artificial Intelligence. 2024. P. 53–95. https://doi.org/10.1007/978-981-99-9211-9_3.
11. Government AI Readiness Index 2024. Oxford Insights. 2024. URL: https://oxfordinsights.com/wp-content/uploads/2024/12/2024-Government-AI-Readiness-Index-2.pdf.
12. Ikhsan R. B., Fernando Y., Prabowo H., Yuniarty, Gui A., Kuncoro E. A. An empirical study on the use of artificial intelligence in the banking sector of Indonesia by extending the TAM model and the moderating effect of perceived trust. *Digital Business*. 2025. Vol. 5, No. 1. 100103. https://doi.org/10.1016/j.digbus.2024.100103.
13. Key directions of monetary and credit policy for the period of 2024 and 2025–2026. Central Bank of Uzbekistan. 2023. URL: https://cbu.uz/upload/medialibrary/51f/wnliwwq12skjw4tnbb78b4rmiztk04bw/Asosiy_yunalishlar_31.10.2023_loyikha.pdf
14. Kruse L., Wunderlich N., Beck R. Artificial Intelligence for the Financial Services Industry: What Challenges Organizations to Succeed. *Proceedings of the 52nd Hawaii International Conference on System Sciences*. 2019. https://doi.org/10.24251/HICSS.2019.770.
15. Lazo M., Ebardo R. Artificial Intelligence Adoption in the Banking Industry: Current State and Future Prospect. *Journal of Innovation Management*. 2023. Vol. 11, No. 3. P. 54–74. https://doi.org/10.24840/2183-0606_011.003_0003.
16. Madan R., Ashok M. AI adoption and diffusion in public administration: A systematic literature review and future research agenda. *Government Information Quarterly*. 2023. Vol. 40, No. 1. 101774. https://doi.org/10.1016/j.giq.2022.101774.
17. Marwala T., Hurwitz E. Artificial Intelligence and Economic Theory: Skynet in the Market. Springer International Publishing. 2017. https://doi.org/10.1007/978-3-319-66104-9.
18. Mayring P. Qualitative Content Analysis: Theoretical Background and Procedures. 2015. P. 365–380. https://doi.org/10.1007/978-94-017-9181-6_13.
19. Milana C., Ashta A. Artificial intelligence techniques in finance and financial markets: A survey of the literature. *Strategic Change*. 2021. Vol. 30, No. 3. P. 189–209. https://doi.org/10.1002/jsc.2403.
20. Noreen U., Shafique A., Ahmed Z., Ashfaq M. Banking 4.0: Artificial Intelligence (AI) in Banking Industry & Consumer's Perspective. *Sustainability*. 2023. Vol. 15, No. 4. 3682. https://doi.org/10.3390/su15043682.
21. Polireddi N. S. A. An effective role of artificial intelligence and machine learning in banking sector. *Measurement: Sensors*. 2024. Vol. 33. 101135. https://doi.org/10.1016/j.measen.2024.101135.
22. Pramanik P., Jana R. K., Ghosh I. AI readiness enablers in developed and developing economies: Findings from the XGBoost regression and explainable AI framework. *Technological Forecasting and Social Change*. 2024. Vol. 205. 123482. https://doi.org/10.1016/j.techfore.2024.123482.
23. Rahman M., Ming T. H., Baigh T. A., Sarker M. Adoption of artificial intelligence in banking services: an empirical analysis. *International Journal of Emerging Markets*. 2023. Vol. 18, No. 10. P. 4270–4300. https://doi.org/10.1108/IJOEM-06-2020-0724.
24. Shaikh A. A., Kumar A., Mishra A., Elahi Y. A. A study of customer satisfaction in using banking services through Artificial Intelligence (AI) in India. *Public Administration and Policy*. 2024. Vol. 27, No. 2. P. 167–181. https://doi.org/10.1108/PAP-05-2023-0060.
25. Tanasa A.-M., Oprea S.-V., Bara A. Web Scraping and Review Analytics. Extracting Insights from Commercial Data. *Ovidius University Annals. Economic Sciences Series*. 2024. Vol. 23, No. 2. P. 370–379. https://doi.org/10.61801/OUAESS.2023.2.45.
26. Tursunbayeva A., Chalutz-Ben Gal H. Adoption of artificial intelligence: A TOP framework-based checklist for digital leaders. *Business Horizons*. 2024. Vol. 67, No. 4. P. 357–368. https://doi.org/10.1016/j.bushor.2024.04.006.
27. Uren V., Edwards J. S. Technology readiness and the organizational journey towards AI adoption: An empirical study. *International Journal of Information Management*. 2023. Vol. 68. 102588. https://doi.org/10.1016/j.ijinfomgt.2022.102588.
28. Xu J., Lee T., Goggin G. AI governance in Asia: policies, praxis and approaches. *Communication Research and Practice*. 2024. Vol. 10, No. 3. P. 275–287. https://doi.org/10.1080/22041451.2024.2391204.

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# Methodological justification of state regulation and self-regulation of the development of the banking sector and its financial security

***Abstract.*** The modern banking sector is developing under conditions of global challenges, digital transformation, and intensified integration into the global financial space. Its key characteristics include the growing role of macroprudential policy, the necessity of ensuring financial stability, and the formation of a balanced combination of state regulation and self-regulation mechanisms.

**Problem statement.** Traditional regulatory and administrative approaches have proven insufficient to prevent crises, as evidenced during financial shocks and especially under the conditions of Ukraine's wartime economy. This highlights the need for a methodological justification of a modern supervisory system that combines state control with institutions of self-regulation.

**Unresolved aspects of the problem.** Despite the implementation of Basel III standards, FSB recommendations, and DORA provisions, unresolved issues remain in the Ukrainian banking sector, including the harmonization of international requirements with national specifics, ensuring the institutional independence of the National Bank of Ukraine, and the development of effective banking associations.

**Purpose of the article.** To formulate a comprehensive methodological framework that combines state regulation and self-regulation of the banking sector in order to safeguard its financial security and resilience to crisis challenges.

**Presentation of the main material.**The article summarizes classical and modern scientific approaches (Diamond-Dybvig, Stiglitz-Weiss models, Allen-Gale's contagion concept, and C. Borio's macroprudential developments) and analyzes the National Bank of Ukraine's experience with implementing SREP, stress testing, and cybersecurity measures. It substantiates three methodological approaches-systemic, integrative, and risk-based. Key components of the methodology are identified: the regulatory and legal framework, institutional structure, supervisory instruments, corporate governance and self-regulation standards, technological infrastructure, and the regulator's human capital.

**Conclusions.** The synergy of state regulation, self-regulation, and risk-based supervision constitutes the foundation of the resilience of Ukraine's banking sector. It will contribute to enhancing investment attractiveness, strengthening financial security, and integrating Ukraine into the European and global financial space.

***Keywords:*** *state regulation, self-regulation, banking sector, financial security, macroprudential policy, Basel III, risk-based supervision.*

**JEL Classification:** G21, G28, G 32, E 58, K23

**Formulas:** 0, **fig:** 0, **tabl:** 1, **bibl:** 38

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**Introduction**. The transformational processes taking place in the modern banking environment are driving the growing importance of a scientifically grounded methodology for regulation and supervision. The banking sector is rapidly evolving under the influence of globalization challenges, digital innovations, financial shocks, geopolitical instability, and structural changes in the global economy. Under such conditions, the application of traditional, standardized regulatory approaches is no longer sufficient to ensure financial stability, prevent systemic risks, and maintain trust in the banking system. This necessitates the development of a methodological framework capable of providing an adequate response to the latest challenges and transformations in banking activities.

**Literature Review**. The issue of methodological justification for state regulation and self-regulation of the banking sector has traditionally been examined through the lens of financial stability and crisis prevention. The classical theoretical foundations were established by Diamond and Dybvig (1983), who, using the model of bank runs, substantiated the role of deposit insurance in maintaining confidence in the banking system [1]. The work of Stiglitz and Weiss (1981) laid the groundwork for understanding information asymmetry and credit rationing, proving that imperfections in the capital market necessitate regulatory intervention to prevent inefficient allocation of resources [2]. Allen and Gale (2000) expanded this logic by demonstrating mechanisms of financial contagion through market liquidity and network connections among banks [3].

Further development of conceptual approaches to regulation took place within the framework of macroprudential policy, where Claudio Borio's research (2003, 2014) played a key role [4]. He systematized the differences between micro- and macroprudential supervision and identified tools aimed at limiting the procyclicality of the financial system, including countercyclical capital buffers and LTV/DTI limits. The influential "Geneva Report" by Brunnermeier, Crockett, Goodhart, Persaud, and Shin (2009) proposed a structural model for managing systemic risks and emphasized the need to combine regulatory and market-based control mechanisms [5]. Empirical studies by Laeven and Valencia (2013, 2020), based on a global database of financial crises, demonstrated the dependence of crisis frequency on institutional quality and the design of regulatory frameworks [6].

The normative consolidation of post-crisis changes occurred through the standards of the Basel Committee on Banking Supervision, which introduced liquidity metrics LCR and NSFR, as well as capital requirements for systemically important banks (G-SIBs) [7]. Recommendations by the Financial Stability Board under the "Key Attributes of Effective Resolution Regimes" and TLAC standards defined mechanisms for the orderly resolution of bank insolvency and the minimization of fiscal costs [8]. The study by Acharya, Engle, and Richardson (2012) highlighted the risk of "regulatory arbitrage" and the need for consolidated supervision over banking groups and non-bank financial intermediaries [9].

In the sphere of self-regulation and corporate governance, the seminal work of Shleifer and Vishny (1997) outlined agency conflicts in the management of companies, including banks [10]. The Basel Committee on Banking Supervision's guidelines on corporate governance for banks (2015), as well as the G20/OECD Principles (2015, 2023), detail the role of boards of directors, independent members, risk committees, and effective remuneration policies as tools of internal control [11]. Kirkpatrick (2009) demonstrated that weak corporate governance mechanisms were among the factors behind the global financial crisis, highlighting the interconnection between internal and external regulatory systems [12].

A distinct research direction has been the digital transformation of regulatory and supervisory processes, described in BIS and FSB reports (2017, 2020) on the use of regtech and suptech. The works of Arner, Barberis, and Buckley (2017) reveal how machine learning technologies, automated transaction analysis, and cloud services are changing AML/CFT controls and operational risk supervision methods. The EU's DORA Regulation (2022) establishes

operational resilience frameworks for financial institutions, requiring the integration of cybersecurity and business continuity plans into internal processes [13].

In the Ukrainian context, methodological approaches to banking system regulation are extensively reflected in the National Bank of Ukraine's *Financial Stability Reports* (2019–2024) and *Macroprudential Policy of the NBU* (2021, 2023). The works of Mishchenko, Naumenkova, and Mishchenko (2016, 2020) examine the evolution of banking supervision tools in Ukraine and the implementation of international standards into national legislation [14-15] Studies by Petryk (2021) and Shkarlet and Danylyshyn (2022) analyze the adaptation of macroprudential requirements to wartime economic conditions, particularly the introduction of new approaches to assessing bank resilience and managing currency risks [16-17].

Empirical studies on the effectiveness of macroprudential instruments globally (Cerutti, Claessens, Laeven, 2017; Kuttner, Shim, 2016; Akinci, Olmstead-Rumsey, 2018) demonstrate that credit growth restrictions and asset price stabilization are achieved through a comprehensive combination of regulatory and self-regulatory tools. In Ukraine, similar results are documented in NBU research (2022, 2023), which confirms that combining state regulation (macroprudential buffers, liquidity requirements) with internal risk management systems reduces the banking sector's vulnerability to external shocks [18-20].

Thus, the contemporary literature shows that the methodological justification for state regulation and self-regulation of the banking sector relies on a comprehensive approach that integrates global standards (Basel III, FSB, DORA), local adaptations (NBU), and internal corporate practices. This ensures a multi-level system of financial security capable of effectively responding to both cyclical fluctuations and crisis events, including wartime and geopolitical risks.

**Purpose, Objectives and Research Methods**. The purpose of this study is to develop a comprehensive methodological framework for the justification of state regulation and self-regulation in the development of the banking sector and the safeguarding of its financial security. The research aims to bridge the theoretical foundations of banking regulation with practical instruments that ensure the resilience of financial institutions under both normal and crisis conditions, including wartime challenges. By synthesizing global best practices and Ukrainian regulatory experience, the study seeks to propose an integrated model that harmonizes prudential oversight with internal governance mechanisms, ensuring long-term stability and trust in the banking system.

To achieve this purpose, the research sets the following objectives: (1) to conduct a critical review of international and domestic literature on state regulation and self-regulation in the banking sector; (2) to identify key methodological approaches used in managing systemic and idiosyncratic risks; (3) to analyze the applicability of global regulatory frameworks, such as Basel III, FSB Key Attributes, and DORA, within the Ukrainian context; (4) to assess the role of corporate governance and risk management systems in reinforcing financial security; and (5) to propose methodological recommendations for enhancing the synergy between external regulation and internal self-regulation in the post-crisis and post-war recovery phases.

The study employs a combination of qualitative and comparative research methods. The qualitative analysis is based on a systematic literature review of peer-reviewed journal articles, monographs, and official reports from regulatory bodies, ensuring the inclusion of both seminal and recent contributions to the field. Comparative analysis is applied to juxtapose international regulatory practices with Ukraine's evolving macroprudential and supervisory frameworks. Additionally, a synthesis method is used to integrate theoretical models and empirical findings into a coherent methodological framework. The research relies exclusively on verified academic and institutional sources, ensuring scientific validity and minimizing the risk of bias or unverified assumptions.

**Research Results**. After the global financial crisis of 2007–2009, the international community recognized the importance of building a regulatory architecture based on in-depth

scientific analysis and the consideration of cause-and-effect relationships between various segments of the financial sector. In response, a number of new standards were developed, including Basel III, which defined the modern paradigm of risk-based banking supervision, focusing on proactive risk management, capital adequacy, and liquidity [7].

Within Ukraine's financial system, additional complexity arises from structural weaknesses such as a high level of market concentration, dependence on external capital, instability of the regulatory environment, and underdeveloped self-regulatory institutions. Banking sector reforms initiated after 2014 significantly changed the principles of interaction between the state and banking institutions; however, the issue of balancing control and autonomy, as well as preventive versus reactive supervisory measures, remains unresolved [21].

In such circumstances, the methodological substantiation of regulatory policy is not merely a technical necessity but a strategic instrument for shaping the country's long-term financial security. In particular, it is important to move from a normative–directive model to a flexible, adaptive regulatory system that takes into account the economic cycle, the specifics of banks' business models, interaction with other financial sectors (insurance, securities markets), and the institutions' level of digital maturity. This approach aligns with European and global trends, particularly within the EU's Single Supervisory Mechanism (SSM), where regulation is multi-level, risk-based, and comparable across countries [7-8].

Another important aspect is the need to account for financial innovations and digital transformation, which radically change banks' risk profiles. Big data, blockchain, open banking, and artificial intelligence create new supervisory challenges that cannot be effectively addressed without modern methodological tools. This requires the development of new forms of stress testing, embedded compliance mechanisms, and a rethinking of the traditional functions of the NBU as regulator [8; 14-15].

In the context of the constant threat of economic and financial crises, it is also essential to methodologically combine macroprudential regulation tools with elements of crisis management. According to the Strategy for Economic Security of Ukraine until 2025, the banking system is defined as a critical component of the state's financial architecture that requires sustainable institutional protection through state regulation and partnership with market participants [22].

Equally significant is the development of self-regulation in the banking sector as part of a new regulatory culture based on responsibility, transparency, and internal control. International experience demonstrates that a balanced interaction between state regulation and self-regulation creates stable financial supervision systems that are flexible to market changes while maintaining public trust [23-25].

Thus, the methodological justification for regulating the banking sector is not an abstract theoretical task but directly influences the efficiency of the financial system's functioning. It should be grounded in clearly structured approaches-systemic, risk-based, integrated, and institutional-which ensure that regulatory mechanisms are consistent with the realities of the modern economic environment, public expectations, and the challenges of the global financial space.

In building an effective and sustainable system of state regulation and self-regulation of the banking sector, it is important to apply a set of methodological approaches that complement one another and ensure comprehensive coverage of all aspects of financial stability. Three key paradigms-systemic, integrative, and risk-based approaches-form the conceptual foundation of modern regulatory policy.

The systemic approach is based on the understanding of the banking sector as a complex, open socio-economic system that functions in interconnection with other sectors of the economy, as well as political and social institutions. The banking system is not isolated; it constantly interacts with monetary policy, the fiscal system, the labor market, the real sector, and external financial flows. Therefore, state regulation should be viewed not as a set of isolated normative tools, but as part of the country's macroeconomic policy [26].

In practical terms, this means that banking regulation must consider multiplier effects: for example, restricting lending in one sector can have a significant impact on investment in other industries. The systemic approach also requires constant monitoring of interdependencies between credit, currency, stock, and insurance markets, which is particularly relevant for Ukraine, where the financial sector is highly vulnerable to external shocks [27]. Systemicity is also reflected in the establishment of institutional cooperation-coordinated work between the National Bank of Ukraine, the Ministry of Finance, the Deposit Guarantee Fund, the National Securities and Stock Market Commission, and other bodies that collectively shape the regulatory environment.

The integrative approach emphasizes the need to synchronize national banking regulation with internationally recognized standards, recommendations, and best practices. In the context of globalization of financial flows and Ukraine's European integration course, it is important to ensure that legislation, institutional structures, and regulatory procedures are compatible with the requirements of the European Union and the Basel Committee on Banking Supervision [7].

This approach involves the implementation of key regulatory documents such as:

1. Basel Core Principles for Effective Banking Supervision, which serve as the foundation for assessing the resilience of the national supervisory system [7-8], [28].

2. Basel III**, which introduces modern requirements for capital, liquidity, leverage, and bank stress testing.

3. EU Directives**, in particular the Capital Requirements Directive (CRD IV) and the Single Supervisory Mechanism Regulation (SSM), which govern supervisory activities in the EU [29].

For Ukraine, the integrative approach is not only an element of financial security but also a prerequisite for strengthening international investor confidence, improving credit ratings, and gaining access to external capital. At the same time, it is important that the implementation of external standards is not merely formal-adaptation should take into account the realities of the Ukrainian market, the institutional capacity of the NBU, and the level of financial literacy among the population [30-32].

The risk-based approach is the central methodological concept of modern banking regulation, involving the assessment, monitoring, and management of risks at both institutional and systemic levels. Its essence lies in shifting from normative control to preventive risk assessment to reduce the likelihood of crisis scenarios.

This approach provides for:

differentiation of the degree of supervision according to the bank's risk profile (size of assets, type of clients, geography of operations, history of violations, etc.);

use of macroprudential policy instruments (e.g., countercyclical buffers, systemic risk limits, monitoring of bank interconnectedness);

regular stress testing to assess banks' resilience to hypothetical crisis scenarios (exchange rate fluctuations, corporate borrower defaults, liquidity shocks) [7].

In NBU practice, the risk-based approach is implemented through the Supervisory Review and Evaluation Process (SREP), which is based on quantitative and qualitative assessments of banks' financial stability. In addition, the regulator analyzes risks related to cybersecurity, compliance, exposures to related parties, and more. This approach becomes particularly relevant in conditions of economic and energy instability, wartime threats, and heightened credit risk due to the loss of many borrowers' solvency.

Applying systemic, integrative, and risk-based approaches within banking regulation methodology makes it possible to create a multidimensional, dynamic, and stable model of regulatory influence. Such a model can respond promptly to internal and external challenges while maintaining a balance between financial stability, institutional efficiency, and public trust in the banking system.

**Discussion**. The methodology for regulating and supervising the banking sector should be based on a comprehensive approach that encompasses not only the legal and regulatory framework, but also institutional–organizational, economic, managerial, and technological elements. Such an approach ensures the effective functioning of the regulatory system in both stable development phases and crisis periods. In this context, six key components of the regulation and supervision methodology can be distinguished:

1. Regulatory and legal framework. The formation of regulatory policy begins with the creation of a stable legal foundation that defines the powers of regulators, mechanisms of influence, boundaries of intervention, and the rights of market participants. The core of national legislation is formed by the Laws of Ukraine "On Banks and Banking" [33] and "On the National Bank of Ukraine" [34], as well as the NBU's regulatory acts. At the same time, the legal framework is gradually being adapted to European requirements, in particular through the implementation of Basel Principles and EU directives. This component serves not only a regulatory function but also ensures institutional legitimacy by defining the limits of permissible banking activities, the responsibilities of management, licensing conditions, capital, liquidity, reporting, and corporate governance requirements. A reliable legal basis is also the foundation for protecting depositors' interests and increasing trust in the banking system.

2. Institutional structure of regulation. The methodology presupposes a clear delineation of roles and responsibilities among the institutions that perform banking supervision. In most countries, regulatory functions are divided between the central bank, the deposit guarantee agency, financial monitoring institutions, and market supervision bodies (securities, insurance, etc.). In Ukraine, the key body is the National Bank of Ukraine, which performs both monetary and regulatory functions, including prudential supervision, solvency assessment, and verification of banks' internal procedures. Other important institutions include:

The Deposit Guarantee Fund (DGF) - responsible for liquidating insolvent banks;

The National Securities and Stock Market Commission (NSSMC) - regulates capital markets;

The State Financial Monitoring Service - responsible for anti–money laundering (AML) measures.

From a methodological perspective, it is important to ensure coordination among all bodies, avoid duplication of powers, and strengthen feedback mechanisms with banks and the public.

3. Regulatory instruments.The tools of state regulation of the banking system can be conditionally divided into:

3.1. Prudential tools:* capital adequacy ratios (N1, N2, N3), liquidity ratios (LCR, NSFR), provisioning, credit risk limits, maximum exposure to related parties, etc.

3.2. Administrative tools: licensing, appointment of temporary administration, license revocation.

3.3. Information and analytical tools: mandatory reporting, monitoring, early warning indicators.

3.4. Macroprudential policy tools: countercyclical buffers, leverage limits, systemic risk assessment, stress testing.

In modern risk-based supervision, these tools are not limited to strict control they are increasingly preventive in nature, aimed at stability support, providing recommendations, and implementing restructuring programs [35-36].

4. Corporate governance and self-regulation standards. The methodology should include elements of corporate responsibility, transparency, independence, and sound internal risk management in banks. According to Basel Committee recommendations, supervisory boards, audit committees, internal control systems, and compliance functions play a key role. Alongside state supervision, a system of self-regulation should be developed through professional banking associations that create codes of conduct, ethical standards, model internal policies, and participate

in shaping regulatory decisions. Such models are widely used in the EU, where self-regulatory institutions are powerful actors in the financial system.

5. Technological infrastructure and digital supervision tools. In the era of digital transformation, regulators must possess advanced technological tools that enable real-time monitoring, automated reporting processing, big data analysis, and anomaly detection. The use of RegTech and SupTech technologies for regulators is becoming an essential part of modern supervisory methodology. The NBU has already introduced online supervision systems, digital reporting, and a stress-testing platform. The Supervisory Review and Evaluation Process (SREP) is also developing, enabling automated and in-depth assessment of each bank across multiple parameters.

6. Human capital and analytical capacity of the regulator. The quality of regulation directly depends on the competence of regulatory staff. Modern methodology requires continuous professional development of NBU employees, expansion of analytical capabilities, use of international best practices, and cooperation with academic institutions. Certification programs, internships at the ECB or Basel Committee, and the publication of research and reports contribute to building the regulator's intellectual infrastructure. It is equally important to ensure the regulator's independence from political pressure or the influence of financial groups, which is critical for the long-term stability of the banking sector.

Each component of the methodology from legislation to technological tools plays its role in the unified system of ensuring financial stability. Their interaction allows not only for risk control but also for the development of a competitive, transparent, and resilient banking sector. In the context of European integration and global financial instability, it is crucial for Ukraine's regulatory methodology to meet the highest standards and practices endorsed by international organizations while being adapted to national conditions.

In today's globalized financial environment, banking regulation and supervision models largely determine not only national economic stability but also integration into the international financial system. Different countries use institutional approaches shaped by the level of economic development, financial market structure, and historical–legal traditions. At the same time, the existence of unified international standards, particularly Basel Committee recommendations and EU practices, enables benchmarking and adaptation in the national context.

Globally, four main regulatory models are distinguished:

1. Institutional model - each type of financial intermediary (banks, insurance companies, stock exchanges) is regulated by a separate specialized body.

2. Functional model - supervision is divided by types of financial services, regardless of the institution type.

3. Integrated model (single regulator) - a "mega-regulator" is established for all financial institutions (e.g., Poland, Hungary).

4. Twin Peaks model - combines a central bank with an independent body responsible for microprudential supervision (e.g., Germany: Bundesbank + BaFin) [23].

Within the EU, a Single Supervisory Mechanism (SSM) has been formed, which provides centralized control over the largest banks by the ECB and supervision of smaller banks through national regulators [8].

Ukraine has chosen a hybrid institutional model in which the NBU performs both macroprudential regulation and microprudential supervision of banks. At the same time, the regulation of other financial institutions (insurance companies, credit unions, pawnshops) was long fragmented among several bodies (NSSMC, National Commission for State Regulation of Financial Services Markets, etc.). Only in 2020, with the implementation of the "split" reform, did the NBU gain authority to regulate the non-banking financial sector.

Currently, the regulatory structure of Ukraine's banking system includes:

1. National Bank of Ukraine (NBU) - the central bank and main regulator, responsible for licensing, prudential supervision, macroprudential analysis, and applying regulatory requirements [37].

2. Deposit Guarantee Fund (DGF) - manages the liquidation of insolvent banks and guarantees deposit repayment.

3. State Financial Monitoring Service -AML authority.

Despite formal convergence with European standards, Ukraine's model has several specific features:

Insufficient institutional independence, especially regarding political pressure on the regulator.

Lack of an effective banking self-regulation mechanism, whereas in the EU and US, active banking associations form part of the regulatory environment.

Low quality of corporate governance in many banks despite requirements for independent supervisory boards.

Limited participation in global supranational regulatory structures.

While Ukraine's regulatory model is gradually improving, several issues require methodological and practical solutions:

1. Strengthening the NBU's institutional independence, especially during political transitions and conflicts of interest between the state and large business.

2. Developing self-regulatory mechanisms through support for banking associations, ethical codes, internal control, and corporate responsibility [31], [38].

3. Integrating into European supervisory structures, participating in international financial stability initiatives, and improving information exchange.

4. Digitizing and automating supervision, developing SupTech, and enhancing the regulator's real-time response capacity.

*Table 1. Comparison of Regulatory Models: International Experience and Ukrainian Realities*

| **Country/Region** | **Model Type** | **Coordinating Authority** | **Key Characteristics** |
|---|---|---|---|
| European Union (Eurozone) | Supranational, Centralized | ECB (SSM) + national regulators | Centralized supervision of systemically important banks, unified criteria [7] |
| Germany | Two-Tier | Bundesbank + BaFin | Separation of macro- and micro-supervision, high independence of regulators [8] |
| United Kingdom | Three-Tier | BoE + PRA + FCA | High level of supervision over conduct risks, financial education [23] |
| United States | Functional | OCC, FDIC, Fed, SEC | Division of powers by type of activity, parallel regulation [23] |
| Ukraine | Institutional (Hybrid) | NBU | Centralized supervision, high concentration of powers, gradual European integration [34[ |

The Ukrainian model of banking regulation is currently at a transitional stage – between adapting to international standards and searching for its own institutional form that would meet national realities. Comparative analysis demonstrates that the effectiveness of regulation is determined not only by the regulatory framework or organizational structure but also by the regulator's ability to respond flexibly to changes, maintain a balance of interests, ensure stability, and foster trust in the banking system. Further integration into the European financial area requires

continued reforms, particularly in the fields of corporate governance, crisis regulation, and digital transformation.

Modern banking sector regulation methodology recognizes the importance not only of state control but also of active involvement of self-regulatory institutions in ensuring the stability, transparency, and efficiency of the financial system. In this context, the interaction between state regulation and self-regulation emerges as a methodological category that reflects the need to balance centralized supervision with market mechanisms of responsibility. Such interaction is based on the principles of subsidiarity, partnership, coordination, and complementarity, enabling the combination of the power of the state with the flexibility and adaptability of the private sector.

Historically, state regulation has evolved as a response to market failures, crises, and information asymmetry characteristic of the financial sphere. Its main goals are to ensure systemic stability, protect depositors' interests, prevent bankruptcies, and combat financial crimes. Conversely, self-regulation has emerged as a mechanism to enhance the internal responsibility of market participants, optimize internal processes, and raise the level of professional ethics.

In the modern financial paradigm, these two systems do not oppose each other but interact, enhancing the overall effectiveness of the regulatory environment. State regulation sets the framework conditions and minimum standards, while self-regulation specifies them according to the specifics of individual banking segments, sectoral features, and professional standards. This approach corresponds to the logic of multi-level governance typical of both the European Union and advanced national systems (Germany, the United Kingdom, the United States).

From a methodological perspective, self-regulation performs the following functions:

1. Norm-setting function – development and implementation of sectoral standards, codes of conduct, and methodological guidelines that specify legislative provisions.

2. Supervisory function – internal monitoring of compliance with ethical standards, transparency, and internal procedures.

3. Arbitration function – resolution of conflicts between market participants outside state jurisdiction.

4. Educational function – professional training, preparation of analytical materials, and development of professional culture.

5. Advisory function – participation in the development of legislative initiatives and provision of expert opinions to state bodies [24;38].

A key element here is responsibility and transparency, which create a mechanism of "soft regulation" that complements and strengthens strict state regulatory measures.

In international practice, various forms of institutionalized self-regulation are widespread. In the United States, self-regulatory organizations (SROs) such as FINRA – a securities market SRO – operate actively with legislatively recognized powers. In the United Kingdom, banks are united in industry associations (e.g., British Bankers' Association) that participate in the national supervisory consultation process. In Germany, strong cooperative banks and associations have the right to internally regulate and audit their members [23].

In Ukraine, self-regulation mechanisms are at an early stage of development. Despite the presence of the Association of Ukrainian Banks, the Independent Association of Banks of Ukraine, and some initiatives to create sectoral codes, the practical role of these institutions in policy-making remains limited. There is no clear legal status for SROs, no system of delegated powers, and no sanctioning mechanisms.

To develop effective interaction between state and self-regulation, the following are necessary:

Legislative definition of the status of self-regulatory organizations;

Establishment of cooperation procedures between the NBU and banking associations;

Development of institutional capacity of associations (analytical, legal, organizational);

Integration of SROs into the Regulatory Impact Assessment process.

Combining state and self-regulatory influence creates regulatory synergy that ensures:

Greater flexibility in responding to challenges (e.g., fintech, cryptocurrencies, cyber risks);

Reduced burden on the state regulator by transferring part of the supervisory functions to the professional community;

Greater legitimacy of decisions through alignment with market participants;

Promotion of a culture of responsible management and ethical business conduct.

From a methodological standpoint, such interaction allows the combination of hard regulatory tools (sanctions, prudential norms) with soft ones (informational tools, self-reflection, public commitments), significantly increasing the system's resilience to stress factors.

As a methodological category, the interaction between state regulation and self-regulation in the banking sector is not only a functional necessity but also a strategic principle in building a modern, flexible, and resilient regulatory system. This approach combines control with trust, directive authority with autonomy, centralization with decentralization – collectively shaping a new quality of banking supervision. For Ukraine, this direction is promising given the need to modernize supervisory mechanisms, strengthen financial security, and ensure competitiveness within the European financial space.

**Conclusions**. Methodological justification of state regulation and self-regulation of the development of the banking sector and its financial security is a fundamental stage in building an effective, flexible, and resilient financial supervision system in the context of transformations in the modern economic environment. The concepts, approaches, and practical implementations analyzed in this subsection make it possible to draw several important conclusions.

First, the need for a methodological approach to banking regulation is driven by the increasing complexity and dynamics of the financial system, especially in the context of digital transformation, global financial risks, geopolitical instability, and integration challenges. Regulatory decisions should be based not on intuition or administrative expediency but on clearly structured approaches that take into account both internal and external factors affecting the banking sector.

Second, the key methodological approaches to building effective regulation include:

The systemic approach, which ensures a comprehensive analysis of the interconnections between the banking system and other sectors of the economy, allows for the forecasting of systemic risks, and improves the quality of managerial decisions;

The integrative approach, aimed at harmonizing Ukrainian standards with European and international norms, in particular the principles of the Basel Committee, the requirements of the SSM, and EU directives.

The risk-based approach, which focuses not only on formal compliance of banks with legislation but also on a qualitative assessment of each institution's risk profile, ensuring a preventive nature of supervision.

Third, the methodology of banking regulation should include a coherent system of components such as: regulatory and legal framework, institutional structure, supervisory tools, corporate governance standards, technological infrastructure, and the regulator's human capital. Each of these components is interconnected and forms a single mechanism aimed at ensuring financial stability.

Fourth, the Ukrainian model of banking sector regulation is in a phase of active reform and gradual adaptation to European standards. Compared to the models of the EU, Germany, the United Kingdom, or the USA, it demonstrates both positive changes (transfer of supervisory functions to the NBU, implementation of SREP, "split" reform) and critical constraints (underdevelopment of self-regulatory institutions, weak institutional independence, limited resources for supervision).

Fifth, the interaction between state regulation and self-regulation is gaining strategic importance. The modern regulatory paradigm recognizes the complementarity of these two systems: the state sets mandatory rules and guarantees systemic stability, while the banking community-

through associations, ethical codes, and standards-forms a responsible professional culture and ensures internal control. Methodologically, such interaction provides greater flexibility, reduces the transaction costs of supervisory activities, and enhances the effectiveness of the regulatory environment.

Thus, the synthesis of state regulation, self-regulation, and risk-based supervisory practices, based on international experience and adaptation to national conditions, is the key to forming a competitive, resilient, and transparent banking sector in Ukraine. This, in turn, will contribute to achieving macro-financial stability, increasing the country's investment attractiveness, and integrating into the global financial space.

**References**

1. Diamond, D. W., & Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*, 91(3), 401–419.
2. Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review*, 71*(3), 393–410.
3. Allen, F., & Gale, D. (2000). Financial contagion. *Journal of Political Economy*, 108(1), 1–33. https://doi.org/10.1086/262109
4. Borio, C. (2014). Macroprudential frameworks: (Too) great expectations? BIS Working Papers, (442).
5. Brunnermeier, M., Crockett, A., Goodhart, C., Persaud, A., & Shin, H. (2009). *The fundamental principles of financial regulation* (Geneva Reports on the World Economy No. 11).
6. Laeven, L., & Valencia, F. (2020). Systemic banking crises database II. *IMF Economic Review*, 68, 307–361. https://doi.org/10.1057/s41308-020-00107-3
7. Basel Committee on Banking Supervision. (2017). Basel III: Finalising post-crisis reforms. Basel: BIS.
8. Financial Stability Board. (2021). Evaluation of the effects of too-big-to-fail reforms. Basel: FSB.
9. Acharya, V., Engle, R., & Richardson, M. (2012). Capital shortfall: A new approach to ranking and regulating systemic risks. *American Economic Review*, 102(3), 59–64. https://doi.org/10.1257/aer.102.3.59
10. Shleifer, A., & Vishny, R. (1997). A survey of corporate governance. *Journal of Finance*, 52(2), 737–783. https://doi.org/10.1111/j.1540-6261.1997.tb04820.x
11. G20/OECD. (2023). Principles of corporate governance. Paris: OECD Publishing.
12. Kirkpatrick, G. (2009). The corporate governance lessons from the financial crisis. OECD *Journal: Financial Market Trends*, 2009(1), 61–87. https://doi.org/10.1787/fmt-v2009-art3-en
13. Arner, D. W., Barberis, J., & Buckley, R. P. (2017). Fintech, regtech, and the reconceptualization of financial regulation. *Northwestern Journal of International Law & Business*, 37(3), 371–413.
14. Mishchenko, V., Naumenkova, S., & Mishchenko, S. (2016). Banking supervision in Ukraine: Problems and perspectives. *Banks and Bank Systems*, 11(3), 20–32. https://doi.org/10.21511/bbs.11%283%29.2016.03
15. Mishchenko, V., Naumenkova, S., & Mishchenko, S. (2020). Implementation of macroprudential policy in Ukraine. Banks and Bank Systems, 15(1), 1–14. https://doi.org/10.21511/bbs.15%281%29.2020.01
16. Petryk, O. (2021). Adaptation of macroprudential regulation in Ukraine during economic shocks. *Financial and Credit Activity: Problems of Theory and Practice*, 4(39), 18–28.
17. Shkarlet, S., & Danylyshyn, B. (2022). Banking system resilience in wartime conditions: The case of Ukraine. *Economic Annals-XXI*, 197(1-2), 4–11. https://doi.org/10.21003/ea.V197-01
18. Cerutti, E., Claessens, S., & Laeven, L. (2017). The use and effectiveness of macroprudential policies: New evidence. *Journal of Financial Stability*, 28, 203–224. https://doi.org/10.1016/j.jfs.2015.10.004
19. Kuttner, K., & Shim, I. (2016). Can non-interest rate policies stabilize housing markets? Evidence from a panel of 57 economies. *Journal of Financial Stability*, 26, 31–44. https://doi.org/10.1016/j.jfs.2016.07.001
20. Akinci, O., & Olmstead-Rumsey, J. (2018). How effective are macroprudential policies? An empirical investigation. *Journal of Financial Intermediation*, 33, 33–57. https://doi.org/10.1016/j.jfi.2017.11.001
21. Khudoliy, A. (2019). Transformation of the Ukrainian banking system regulation. *Banks and Bank Systems*, 14(4), 27–36. Retrieved from: https://www.businessperspectives.org/images/pdf/applications/publishing/templates/article/assets/12707/BBS_2019_04_Khudoliy.pdf
22. Decree of the President of Ukraine No. 347/2021. (2021). On the Decision of the National Security and Defense Council of Ukraine of August 11, 2021 "On the Economic Security Strategy of Ukraine until 2025." https://www.president.gov.ua/documents/3472021-39613 [in Ukranian]
23. International Monetary Fund. (2006). Is one watchdog better than three? International experience with integrated financial sector supervision (IMF Working Paper WP/06/57). https://www.imf.org/external/pubs/ft/wp/2006/wp0657.pdf
24. Mozghovyi, Y., Kondrunina, K., Ratnykova, I., & Skidan, D. D. (2011). Corporate governance regulation in banks in the context of crisis: The role of the National Bank of Ukraine. *Corporate Ownership & Control*, 9(1), 221–229. https://virtusinterpress.org/IMG/pdf/10-22495cocv9i1c1art6.pdf
25. Fedorushchenko, B. V. (2021). Determinants and threats to the financial security of the banking sector. Finansovyi prostir, 3, 44–51. [in Ukranian]
26. Bakumenko, V. D. (2000). Formation of public administration decisions: Problems of theory, methodology, and practice. [in Ukranian]

27. Alieksieiev, I., Zhelizniak, R., Gliebova, N., Pavlenko, L., Kovalenko, V., et al. (2023). Development of the model for forecasting indicators of banking microcrediting of small business entities. *Financial and Credit Activity: Problems of Theory and Practice*, 2(49), 163–180. https://doi.org/10.55643/fcaptp.2.49.2023.4025
28. Chugunov, I., Sidelnykova, L., Sosnovska, O., Zhytar, M., & Navolokina, A. (2022). Tools for assessing the level of adaptivity of the financial architecture of economy to financial globalization conditions based on the capacity of banks, non-banking financial institutions and stock market. *WSEAS Transactions on Business and Economics*, 19, 1075–1084. https://doi.org/10.37394/23207.2022.19.94
29. Financial supervisory architecture since the global crisis. (2018). *VoxEU*. Retrieved from: https://cepr.org/voxeu/columns/financial-supervisory-architecture-global-crisis-supervisory-models-remain-diverse
30. Doroshenko, N., Doroshenko, O., & Melnychenko, V. (2019). Bringing the standards of Ukrainian banking legislation to EU standards. Advances in Economics, *Business and Management Research*, 188, 17–22. https://www.atlantis-press.com/article/125960335.pdf
31. Mozghovyi, Y., & Pavliuk, O. (2020). Formation of the concept of risk-oriented banking supervision in Ukraine. *International Economic Policy*, 32-33, 56–65. [in Ukranian]
32. Tseluiko, O. I. (2021). Features of state regulation of the banking system in the conditions of European integration. *Law and Public Administration*, 1, 262–270.
33. Law of Ukraine No. 2121-III. On banks and banking activity. https://zakon.rada.gov.ua/laws/show/2121-14#Text [in Ukranian]
34. Law of Ukraine No. 679-XIV. On the National Bank of Ukraine]. https://zakon.rada.gov.ua/laws/show/679-14#Text [in Ukranian]
35. Zhytar, M., & Samorodov, B. (2022). Infrastructural assurance of the mechanism for regulating imbalances in the movement of financial resources of the Ukrainian economy in the context of external fluctuations. *Financial and Credit Systems: Prospects for Development*, 1(4), 28–36 https://doi.org/10.26565/2786-4995-2022-1-03
36. Kachula, S., Zhytar, M., Sidelnykova, L., Perchuk, O., & Novosolova, O. (2022). The relationship between economic growth and banking sector development in Ukraine. WSEAS Transactions on Business and Economics, 19, 222–230. https://doi.org/10.37394/23207.2022.19.21
37. Samorodov, B. V., Sosnovska, O. O., Zhytar, M. O., & Ananieva, J. V. (2020). Methodical approach to the quantification of enterprise financial security level. *Financial and Credit Activity: Problems of Theory and Practice*, 32, 269–277.
38. Ustynova, I., & Poltoratska, Y. (2017). International practices of organizing the banking system as models for reforming banking supervision in Ukraine. Scientific Papers of the National Aviation University. Series: Legal Bulletin "Air and Space Law", 1(42), 86–91. Retrieved from: https://er.nau.edu.ua [in Ukranian]

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## Методологічне обґрунтування державного регулювання і саморегулювання розвитку банківського сектору та його фінансової безпеки

**Анотація.** Сучасний банківський сектор розвивається в умовах глобальних викликів, цифрової трансформації та посиленої інтеграції у світовий фінансовий простір. Його ключовими характеристиками є зростаюча роль макропруденційної політики, необхідність забезпечення фінансової стійкості та формування збалансованого поєднання державного регулювання й механізмів саморегулювання. Разом із тим посилюється вплив зовнішніх шоків, зокрема воєнних та геополітичних ризиків, що потребують адаптивних регуляторних механізмів. Важливою особливістю є й підвищена залежність банківської системи від цифрових технологій, що формує нові виклики у сфері кіберстійкості та операційної безпеки.

**Постановка проблеми.** Традиційні нормативно-адміністративні підходи до регулювання виявляються недостатніми для запобігання кризам, що проявилося під час фінансових потрясінь і особливо в умовах воєнної економіки України. Виникає потреба в методологічному обґрунтуванні сучасної системи нагляду, яка поєднувала б державний контроль та інститути саморегулювання.

**Нерозв'язані аспекти.** Незважаючи на імплементацію стандартів Basel III, рекомендацій FSB та норм DORA, в українському банківському секторі залишаються невизначеними питання гармонізації міжнародних вимог із національними особливостями, забезпечення інституційної незалежності НБУ та розбудови ефективних банківських асоціацій.

**Мета статті.** Сформулювати цілісну методологічну основу для поєднання державного регулювання й саморегулювання розвитку банківського сектору з метою забезпечення його фінансової безпеки та стійкості до кризових викликів.

**Основний матеріал.** У статті узагальнено класичні та сучасні наукові підходи (моделі Даймонда-Дибвіга, Стігліца-Вайса, концепція Аллена-Гейла, макропруденційні розробки К. Боріо), проаналізовано досвід НБУ щодо впровадження SREP, стрес-тестування, кіберстійкості. Обґрунтовано три методологічні підходи - системний, інтегративний та ризик-орієнтований. Визначено ключові компоненти методології: нормативно-правову базу, інституційну структуру, регуляторні інструменти, стандарти корпоративного управління, технологічну інфраструктуру та кадровий потенціал регулятора.

**Висновки.** Синергія державного регулювання, саморегулювання та ризик-орієнтованого нагляду є фундаментом стійкості банківського сектору України. Це сприятиме підвищенню інвестиційної привабливості, посиленню фінансової безпеки та інтеграції України до європейського й глобального фінансового простору.

**Ключові слова:** державне регулювання, саморегулювання, банківський сектор, фінансова безпека, макропруденційна політика, Basel III, ризик-орієнтований нагляд.

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**Список літератури**

1. Diamond D. W., Dybvig P. H. Bank runs, deposit insurance, and liquidity. Journal of Political Economy. 1983. Vol. 91, No. 3. P. 401–419.
2. Stiglitz J. E., Weiss A. Credit rationing in markets with imperfect information. American Economic Review. 1981. Vol. 71, No. 3. P. 393–410
3. Allen F., Gale D. Financial contagion. Journal of Political Economy. 2000. Vol. 108, No. 1. P. 1–33. DOI: https://doi.org/10.1086/262109
4. Borio C. Macroprudential frameworks: (Too) great expectations? BIS Working Papers. 2014. No. 442

5. Brunnermeier M., Crockett A., Goodhart C., Persaud A., Shin H. The Fundamental Principles of Financial Regulation. Geneva Reports on the World Economy. 2009. No. 11
6. Laeven L., Valencia F. Systemic banking crises database II. IMF Economic Review. 2020. Vol. 68. P. 307–361. DOI: https://doi.org/10.1057/s41308-020-00107-3
7. Basel Committee on Banking Supervision. Basel III: Finalising post-crisis reforms. Basel: BIS, 2017
8. Financial Stability Board. Evaluation of the effects of too-big-to-fail reforms. Basel: FSB, 2021
9. Acharya V., Engle R., Richardson M. Capital shortfall: A new approach to ranking and regulating systemic risks. American Economic Review. 2012. Vol. 102, No. 3. P. 59–64. DOI: https://doi.org/10.1257/aer.102.3.59
10. Shleifer A., Vishny R. A survey of corporate governance. Journal of Finance. 1997. Vol. 52, No. 2. P. 737–783. DOI: https://doi.org/10.1111/j.1540-6261.1997.tb04820.x
11. G20/OECD. Principles of corporate governance. Paris: OECD Publishing, 2023
12. Kirkpatrick G. The corporate governance lessons from the financial crisis. OECD Journal: Financial Market Trends. 2009. No. 1. P. 61–87. DOI: https://doi.org/10.1787/fmt-v2009-art3-en
13. Arner D. W., Barberis J., Buckley R. P. Fintech, regtech, and the reconceptualization of financial regulation. Northwestern Journal of International Law & Business. 2017. Vol. 37, No. 3. P. 371–413
14. Mishchenko V., Naumenkova S., Mishchenko S. Banking supervision in Ukraine: Problems and perspectives. Banks and Bank Systems. 2016. Vol. 11, No. 3. P. 20–32. DOI: https://doi.org/10.21511/bbs.11%283%29.2016.03
15. Mishchenko V., Naumenkova S., Mishchenko S. Implementation of macroprudential policy in Ukraine. Banks and Bank Systems. 2020. Vol. 15, No. 1. P. 1–14. DOI: https://doi.org/10.21511/bbs.15%281%29.2020.01
16. Petryk O. Adaptation of macroprudential regulation in Ukraine during economic shocks. Financial and Credit Activity: Problems of Theory and Practice. 2021. Vol. 4, No. 39. P. 18–28.
17. Shkarlet S., Danylyshyn B. Banking system resilience in wartime conditions: The case of Ukraine. Economic Annals-XXI. 2022. Vol. 197, No. 1-2. P. 4–11. DOI: https://doi.org/10.21003/ea.V197-01
18. Cerutti E., Claessens S., Laeven L. The use and effectiveness of macroprudential policies: New evidence. Journal of Financial Stability. 2017. Vol. 28. P. 203–224. DOI: https://doi.org/10.1016/j.jfs.2015.10.004
19. Kuttner K., Shim I. Can non-interest rate policies stabilize housing markets? Evidence from a panel of 57 economies. Journal of Financial Stability. 2016. Vol. 26. P. 31–44. DOI: https://doi.org/10.1016/j.jfs.2016.07.001
20. Akinci O., Olmstead-Rumsey J. How effective are macroprudential policies? An empirical investigation. Journal of Financial Intermediation. 2018. Vol. 33. P. 33–57. DOI: https://doi.org/10.1016/j.jfi.2017.11.001
21. Khudoliy, A. (2019). Transformation of the Ukrainian Banking System Regulation. Banks and Bank Systems, 14(4), 27–36. URL: https://www.businessperspectives.org/images/pdf/applications/publishing/templates/article/assets/12707/BBS_2019_04_Khudoliy.pdf
Про рішення Ради національної безпеки і оборони України від 11 серпня 2021 року «Про Стратегію економічної безпеки України на період до 2025 року». Указ Президента України №347/2021. URL: https://www.president.gov.ua/documents/3472021-39613
23. International Monetary Fund. (2006). Is One Watchdog Better Than Three? International Experience with Integrated Financial Sector Supervision. IMF Working Paper, WP/06/57.URL: https://www.imf.org/external/pubs/ft/wp/2006/wp0657.pdf
24. Mozghovyi, Y., Kondrunina, K., Ratnykova, I., & Skidan, D. D. (2011). Corporate Governance Regulation in Banks in the Context of Crisis: The Role of the National Bank of Ukraine. Corporate Ownership & Control, 9(1), 221–229. URL: https://virtusinterpress.org/IMG/pdf/10-22495cocv9i1c1art6.pdf
25. Федорущенко Б. В. Детермінанти і загрози фінансовій безпеці банківського сектору. Фінансовий простір. 2021. № 3. С.44-51
26. Бакуменко В. Д. Формування державноуправлінських рішень: проблеми теорії, методології, практики: монографія. Київ, 2000. 328 с.
27. Alieksieiev Ihor, Zhelizniak Roman, Gliebova Nataliia, Pavlenko Liudmyla, Kovalenko Volodymyr and others. Development of The Model For Forecasting Indicators of Banking Microcrediting of Small Business Entities. Financial and Credit Activity: Problems of Theory and Practice. № 2 (49). 163-180. DOI: https://doi.org/10.55643/fcaptp.2.49.2023.4025
28. Chugunov I., Sidelnykova L., Sosnovska O., Zhytar M., Navolokina A. Tools for Assessing the Level of Adaptivity of the Financial Architecture of Economy to Financial Globalization Conditions based on the Capacity of Banks, Non-Banking Financial Institutions and Stock Market. WSEAS Transactions on Business and Economics. 2022. № 19. P. 1075-1084. DOI: https://doi.org/10.37394/23207.2022.19.94
Financial supervisory architecture since the Global Crisis. (2018). VoxEU. URL: https://cepr.org/voxeu/columns/financial-supervisory-architecture-global-crisis-supervisory-models-remain-diverse
30. Doroshenko, N., Doroshenko, O., & Melnychenko, V. (2019). Bringing the Standards of Ukrainian Banking Legislation to EU Standards. Advances in Economics, Business and Management Research, 188, 17–22. URL: https://www.atlantis-press.com/article/125960335.pdf
31. Mozghovyi, Y., Pavliuk, O. (2020). Formation of the Concept of Risk-Oriented Banking Supervision in Ukraine. International Economic Policy, 32-33, 56–65
32. Целуйко О. І. Особливості державного регулювання банківської системи в умовах євроінтеграції. Право та державне управління. 2021. № 1. С. 262–270
33. Про банки та банківську діяльність: Закон України від 7.12.2000 р. № 2121-III. URL: https://zakon.rada.gov.ua/laws/show/2121-14#Text

34. Про Національний банк України: Закон України від 20.05.1999 р. № 679-XIV. URL: https://zakon.rada.gov.ua/laws/show/679-14#Text
35. Zhytar M., Samorodov B. Infrastructural Assurance of the Mechanism For Regulating Imbalances in The Movement of Financial Resources of The Ukrainian Economy in The Context of External Fluctuations. Financial and credit systems: prospects for development. 2022. № 1(4). P.28-36 DOI: https://doi.org/10.26565/2786-4995-2022-1-03
36. Kachula S., Zhytar M., Sidelnykova L., Perchuk O., Novosolova O. The Relationship between Economic Growth and Banking Sector Development in Ukraine.WSEAS Transactions on Business and Economics. 2022. № 19. P. 222-230. DOI: 10.37394/23207.2022.19.21
37. Samorodov B.V., Sosnovska O.O., Zhytar M.O., Ananieva J.V. Methodical approach to the Quantification of Enterprise Financial Security Level. Financial and credit activity: problems of theory and practice, 2020. № 32. P. 269-277
38. Устинова І., Полторацька Ю. Міжнародні практики організації банківської системи як моделі для реформування банківського нагляду в Україні. Наукові праці Національного авіаційного університету. Серія: Юридичний вісник «Повітряне і космічне право». Київ : НАУ, 2017. № 1(42). С. 86–91 URL: https://er.nau.edu.ua

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# Prospects for the implementation of Global Internal Audit Standards in the banking sector of Ukraine: adaptation to international requirements and national realities

**Abstract.** Internal audit in banks is a key tool for enhancing the efficiency and resilience of the banking system, providing an independent assessment of governance, control, and risk management systems. The activities of internal audit units are regulated by international standards, particularly the Global Internal Audit Standards (GIAS) 2024, adapted to the Ukrainian context.

**Problem statement.** Under conditions of economic instability and external challenges, including martial law, the harmonization of national approaches to internal audit with international standards has become especially relevant, as it will improve control efficiency, transparency, and trust in the banking system.

**Unresolved issues.** Despite the existing regulatory framework, problems remain in resource provision, staff qualification levels, implementation of modern audit technologies, and the readiness of bank management to actively cooperate with internal audit units. The adaptation of GIAS to the public sector also remains insufficiently explored.

**Purpose of the article.** To substantiate the prospects for implementing the GIAS 2024 in the Ukrainian banking sector, considering international experience, national regulatory specifics, and current financial security challenges.

**Main material.** The article presents a comparative analysis of the structure and content of the GIAS 2024 and previous standards, highlighting the five domains of the new standards, their principles, requirements, and implementation guidelines. The difficulties of adapting the requirements - particularly in resource provision, communication with supervisory boards, and the introduction of KPIs for evaluating audit effectiveness—are analyzed. Practical aspects of implementing new procedures are identified, including strengthening the role of internal audit in risk management systems and supporting the digital transformation of banks.

**Conclusions.** The implementation of GIAS 2024 in the Ukrainian banking sector has the potential to significantly improve the quality of internal control, align with international standards, and strengthen investor confidence. Successful realization requires methodological guidelines, a clear system of performance indicators, updated internal bank regulations, adequate financial and human resources, and integration of the standards into the daily practice of internal auditors.

**Keywords:** internal audit, Global Internal Audit Standards, banking sector, risk management, international standards, financial security.

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**Introduction.** Internal audit in banks plays an exceptional role in ensuring the efficiency and resilience of the banking system, serving as an independent tool for assessing and improving governance, control, and risk management systems.
The internal audit standards applied in Ukrainian banks are the International Standards for the Professional Practice of Internal Auditing, adopted by the International Internal Audit Standards Board (IIASB) and approved by the International Professional Practices Framework Oversight Council (IPPFOC), which define the general principles (procedures) that internal audit units must follow in the performance of their functions [1]. It should be noted that internal audit standards are continuously reviewed and improved. Thus, as of January 9, 2025, the Global Internal Audit Standards (GIAS) 2024 are in force [2]. Their official Ukrainian translation is available on the website of the Institute of Internal Auditors of Ukraine.

The relevance of this study is driven by the growing need to strengthen the Ukrainian banking system under conditions of economic instability, integration processes, and external challenges, particularly those related to martial law. Internal audit, as an independent management function, becomes especially important for ensuring the financial stability of banks and fostering trust from the state, investors, and society. In this context, a key task is the adaptation and implementation of the GIAS 2024, which serve as a modern tool for harmonizing audit processes with international practice. Given that the Ukrainian banking system aims to comply with EU standards and global financial control requirements, the study of mechanisms and prospects for implementing the new internal audit standards is both scientifically justified and practically necessary.

**Literature Review.** Theoretical aspects of the internal audit system in banks and the mechanisms of their practical implementation have been actively examined by both domestic and foreign researchers.

The scholarly contribution of Skasko O. and Dmyshko Ya. (2023) lies in defining criteria for assessing the efficiency of internal audit systems in banks by revealing the mechanisms of their interaction with the National Bank of Ukraine and audit firms under conditions of uncertainty during wartime. The authors proposed ways to improve bank management quality through streamlining the functioning mechanisms of internal audit and identified directions for enhancing the efficiency of organizing internal audit inspections in banks to improve the quality of management processes.

Krutova A. S. and Semenets A. O. (2018) systematized the shortcomings of domestic regulatory support for internal audit and developed measures to address them, taking into account international experience, by implementing global best practices into the national legal framework.

Mukiibi S. and Kabanda R. (2025) examined the impact of internal audit practices on financial performance. The study concluded that strengthening internal audit practices - including risk management, financial oversight, and compliance monitoring - is crucial for improving financial performance.

Particular attention should be paid to the research of Male K. and Irumba A. (2025), which focuses on the effectiveness of audit practices and their impact on bank cash flow management. The study investigated how the functions, policies, and procedures of internal audit contribute to the accuracy, accountability, and efficiency of managing a bank’s financial flows.

Research by several foreign scholars focuses on identifying the challenges and barriers that arise in the practical implementation of the Global Internal Audit Standards within organizations and institutions of various levels and forms of ownership.

As Lenz and O’Regan (2024) note, while the revised Global Internal Audit Standards favor a principles-based approach, the prescriptiveness of the IIA’s Standards continues to constrain individual judgment and critical reasoning, narrowing the intellectual and moral horizons of modern internal auditing.

Shaban and Barakat (2023) emphasize that while internal auditing plays a crucial role in ensuring regulatory compliance, identifying risks, and enhancing efficiency, the effectiveness of internal audit standards in fostering value-added tasks - such as strategic planning and risk management - remains insufficiently examined, especially in emerging markets.

**Purpose, objectives, and research methods.** The purpose of the study is to substantiate the prospects for implementing the Global Internal Audit Standards in the Ukrainian banking sector, taking into account international experience, national regulatory specifics, and current challenges in the field of financial security. To achieve this aim, the following objectives were set: to analyze the structure, content, and significance of the Global Internal Audit Standards in the context of the modern financial environment; to identify the main challenges in implementing the Global Internal Audit Standards in Ukrainian banks; and to propose practical recommendations for their implementation in Ukraine's banking sector.

The research methods include: analysis and synthesis (for studying scientific literature, legal acts, and internal audit standards); comparative analysis (for comparing the features of the GIAS 2024 with the International Standards for the Professional Practice of Internal Auditing 2017); a systemic approach (for assessing internal audit as part of the corporate governance system in banks); and the abstract-logical method (for theoretical generalization of conclusions and analysis of research results).

**Results.** In terms of content and structure, the current Global Internal Audit Standards (GIAS) 2024 differ significantly from the previous standards applied in the Ukrainian banking sector - the International Standards for the Professional Practice of Internal Auditing (2017). The main features of the GIAS 2024 are outlined below.

The Global Internal Audit Standards are grouped into five domains, namely:

- Domain I: Purpose of Internal Auditing;
- Domain II: Ethics and Professionalism;
- Domain III: Governing the Internal Audit Function;
- Domain IV: Managing the Internal Audit Function;
- Domain V: Performing Internal Audit Services.

Domains II–V are further divided into 15 principles, each of which is fulfilled through corresponding standards. The total number of GIAS is 52.

A distinctive feature of the standards' structure is their three-element composition:

1. *requirements* – provide clear instructions using the term "must";
2. *implementation guidance* – contain clarifications on how the requirements may be achieved;
3. *examples of conformance evidence* – not only help confirm compliance with a specific standard but also assist in preparing for an overall quality assessment of the internal audit system.

**Domain I – Purpose of Internal Auditing** defines the aim of internal auditing as follows: "Internal auditing enhances an organization's ability to create, protect, and sustain value by providing the board and management with independent, risk-based, and objective assurance, advice, insight, and foresight" [2].

Key aspects of Domain I include a risk-based approach, support for the organization's ability to serve the public interest, the combination of assurance and consulting services, and the independence and objectivity of internal auditors.

**Domain II – Ethics and Professionalism** replaces the former Code of Ethics of the Institute of Internal Auditors and establishes expectations for the professional conduct of internal auditors, including chief audit executives and others providing internal audit services. It contains 5 principles and 13 standards (Table 1).

*Table 1. Structure of Domain II «Ethics and Professionalism» Global Internal Audit Standards 2024*

| GIAS 2024 Principles | Standards |
|---|---|
| Principle 1. Demonstrate Integrity | 1.1 Integrity and Professional Courage<br>1.2 Ethical Expectations of the Organization<br>1.3 Lawful and Ethical Conduct |
| Principle 2. Maintain Objectivity | 2.1 Individual Objectivity<br>2.2 Preserving Objectivity<br>2.3 Disclosure of Impairments to Objectivity |
| Principle 3. Demonstrate Competence | 3.1 Competence<br>3.2 Continuing Professional Development |
| Principle 4. Apply Due Professional Care | 4.1 Conformance with the Global Internal Audit Standards<br>4.2 Due Professional Care<br>4.3 Professional Skepticism |
| Principle 5. Maintain Confidentiality | 5.1 Use of Information<br>5.2 Protection of Information |

*Source: compiled by the author based on [2]*

According to Table 1, GIAS retain principles of integrity, objectivity, competence, and confidentiality, which were also inherent in the Code of Ethics. However, a new requirement appears in Standard 1.1 - *professional courage*. This standard states: "Internal auditors must demonstrate professional courage by communicating truthfully and taking appropriate action, even when faced with dilemmas and difficult situations" [2].

**Domain III – Governing the Internal Audit Function** sets clear requirements for chief audit executives to work closely with the board in establishing the internal audit function, ensuring its independence, and overseeing its activities. Senior management is also responsible for supporting effective corporate governance of the internal audit function. The domain consists of 3 principles and 9 standards (Table 2).

*Table 2. Structure of Domain III «Governing the Internal Audit Function» Global Internal Audit Standards 2024*

| GIAS 2024 Principles | Standards |
|---|---|
| Principle 6. Obtain Authority from the Board | 6.1 Internal Audit Mandate<br>6.2 Internal Audit Charter<br>6.3 Support from the Board and Senior Management |
| Principle 7. Maintain an Independent Position | 7.1 Organizational Independence<br>7.2 Qualifications of the Chief Audit Executive |
| Principle 8. Be Overseen by the Board | 8.1 Engagement with the Board<br>8.2 Resources<br>8.3 Quality<br>8.4 External Quality Assessment |

*Source: compiled by the author based on [2]*

The Chief Audit Executive's Guide to Domain III [4] highlights several practical challenges, especially in the public sector. These include limited board authority in state-owned banks (often restricted by political functions), insufficient resources or authority of audit committees to influence management decisions, and funding or staffing constraints that conflict with Standards 7.1 ("Organizational Independence") and 8.2 ("Resources").

Moreover, higher qualification requirements for chief audit executives under Standard 7.2 and the need for continuous learning entail additional costs, which not all banks can afford. Implementing Domain III also requires updating internal audit documents and procedures, conducting gap analyses, and revising mandates and strategic plans - tasks demanding both time and expertise. Resistance from management to deeper engagement with the board may further hinder implementation. Thus, successful adoption of Domain III depends on systemic changes in governance approaches, adequate resources, and active stakeholder dialogue.

**Domain IV – Managing the Internal Audit Function** details the responsibilities of the chief audit executive, including strategic planning, obtaining and allocating resources, stakeholder communication, and ensuring continuous improvement in the internal audit function's performance. The domain includes 4 principles and 16 standards (Table 3).

*Table 3. Structure of Domain IV «Managing the Internal Audit Function» Global Internal Audit Standards 2024*

| GIAS 2024 Principles | Standards |
|---|---|
| Principle 9. Plan Strategically | 9.1 Understanding Governance, Risk Management, and Control Processes<br>9.2 Internal Audit Strategy<br>9.3 Methodology<br>9.4 Internal Audit Plan<br>9.5 Coordination and Reliance on the Work of Others |
| Principle 10. Manage Resources | 10.1 Managing Financial Resources<br>10.2 Managing Human Resources<br>10.3 Technological Resources |
| Principle 11. Communicate Effectively | 11.1 Building Relationships and Communicating with Stakeholders<br>11.2 Effective Communication<br>11.3 Communicating Results<br>11.4 Errors and Omissions<br>11.5 Communication on Risk Acceptance |
| Principle 12. Enhance Quality | 12.1 Internal Quality Assessment<br>12.2 Performance Measurement<br>12.3 Supervision and Enhancement of Engagement Performance |

*Source: compiled by the author based on [2]*

Domain IV introduces new requirements such as developing an internal audit strategy alongside the audit plan (Standard 9.2), and a thorough understanding of governance, risk management, and control processes (Standard 9.1). This includes assessing how the organization identifies and evaluates significant risks, and how it selects appropriate controls in key risk areas:

- reliability and integrity of financial and operational information;
- effectiveness and efficiency of operations and programs;
- safeguarding of assets;
- compliance with laws and regulations.

Such a *risk-oriented approach* is also preserved in the requirements for developing the internal audit strategy, plan, and methodology, as defined in Standards 9.2–9.4 [2].

The implementation of Standards 10.1–10.3 may be challenging due to insufficient funding of IT infrastructure, the lack of specialized software solutions for auditing, and a shortage of qualified personnel.

Principle 11 of the GIAS requires internal auditors to ensure effective communication; however, its practical implementation also encounters a number of problematic aspects. In particular, the implementation of Standard 11.2, which requires regular reporting of audit results to the board of directors, may be hindered by ineffective stakeholder communication, since in Ukrainian banks this practice is often overly formalized due to excessive bureaucracy.

According to the requirements of Standard 11.5, if *"the chief audit executive concludes that management has accepted a level of risk that exceeds the organization's risk appetite or tolerance, the issue must be discussed with senior management. If the chief audit executive determines that the matter has not been resolved by senior management, it must be escalated to the board"* [2].

Therefore, compliance with Standard 11.5 regarding risk acceptance reporting requires the development of appropriate risk communication mechanisms, which is complicated by the fear of conflicts with management.

Particular attention should also be paid to the requirements of Principle 12 of the GIAS, which provide for conducting both external and internal quality assessments of internal audit. Meeting this requirement necessitates the development of criteria for evaluating the performance of internal audit assignments, internal auditors, and the internal audit function as a whole. Such criteria form the basis for assessing progress toward effectiveness goals.

The implementation of Standard 12.2 essentially involves the introduction of a system of performance indicators for assessing internal audit activities — namely, **key performance indicators (KPIs)**. The standard provides several examples of such indicators, including:

- coverage of task objectives defined for verification according to the internal audit mandate;
- percentage of key risks and control measures tested within the organization;
- stakeholder satisfaction with the understanding of task objectives, timeliness of task execution, and clarity of audit findings;
- percentage of the internal audit plan completed on time;
- balance between assurance and consulting tasks in the internal audit plan in line with the audit strategy;
- external quality assessments confirming compliance of the internal audit function with the Standards, etc.

The application of Standard 12.2 in practice requires a well-developed methodology for calculating performance indicators. Therefore, its implementation should be preceded by the development of appropriate methodological support for the internal audit performance evaluation process. It is advisable to establish a list of necessary indicators and determine the methodology for their calculation at the national level.

**Domain V – Performing Internal Audit Services** shifts focus from management requirements to auditor-level tasks. It sets out obligations for effective task planning, conducting audits, developing recommendations and action plans, and maintaining communication with management throughout and after the engagement. The domain consists of 3 principles and 14 standards (Table 4).

*Table 4. Structure of Domain V «Performing Internal Audit Services» Global Internal Audit Standards 2024*

| GIAS 2024 Principles | Standards |
|---|---|
| Principle 13. Plan Engagements Effectively | 13.1 Engagement Communication<br>13.2 Engagement Risk Assessment<br>13.3 Engagement Objectives and Scope<br>13.4 Evaluation Criteria<br>13.5 Engagement Resources<br>13.6 Engagement Work Program |
| Principle 14. Conduct Engagements | 14.1 Gathering Information for Analysis and Evaluation<br>14.2 Engagement Analysis and Potential Observations<br>14.3 Evaluation of Observations<br>14.4 Recommendations and Action Plans<br>14.5 Engagement Conclusions<br>14.6 Engagement Documentation |
| Principle 15. Communicate Engagement Results and Monitor Action Plans | 15.1 Final Engagement Communication (Report)<br>15.2 Confirmation of Recommendation or Action Plan Implementation |

*Source: compiled by the author based on [2]*

A key feature of Domain V is the emphasis on comprehensive documentation of all audit engagement stages - planning, execution, reporting, and follow-up, which increases administrative workload. The requirement to formalize each step poses particular challenges for small internal audit units.

**Discussion.** The process of implementing the Global Internal Audit Standards (GIAS) is ongoing and requires harmonization of a number of national regulatory requirements in the field of internal audit. The active discussions surrounding this process have been fueled by the presentation of the draft law *"On Amendments to the Law of Ukraine 'On the Audit of Financial Statements and Auditing Activities' and Certain Laws of Ukraine Regarding the Improvement of Legislation in the Field of Auditing Activities"*.

In particular, the All-Ukrainian Public Organization *"Institute of Internal Auditors of Ukraine"* has expressed concern over the proposed amendments to the Law of Ukraine *"On the Audit of Financial Statements and Auditing Activities"* that pertain to the internal auditing

profession. In their opinion, certain provisions of the draft law fail to take into account the specifics of the internal auditor profession and internationally recognized approaches to its regulation. This could have negative consequences both for the professional community of internal auditors and for the economy as a whole.

The GIAS set high requirements for the professional competence and ethical conduct of internal auditors. The proposed changes do not incorporate these standards, creating the risk of Ukraine diverging from established international practices [6].

Overall, it should be noted that the implementation of the GIAS in the Ukrainian banking sector is a significant step toward enhancing the effectiveness, transparency, and professionalism of internal audit in banks. The key prospects for implementing the GIAS include:

1. Improving the quality of internal audit, particularly by raising requirements for the documentation of auditors' work; enhancing communication with management and supervisory bodies, which will ensure a deeper understanding of risks and more effective control.
2. Harmonizing domestic internal audit requirements with international ones, which is crucial for integrating Ukraine's banking sector into global financial markets and increasing investor and partner confidence.
3. Enhancing the professional competencies of auditors, including updating training programs and raising qualification requirements for internal auditors, which will contribute to the development of professional skills.
4. Strengthening the role of internal audit in the risk management system, enabling banks to more effectively identify, assess, and manage various types of risks.
5. Supporting digital transformation, as the GIAS address modern technological challenges, particularly in IT systems auditing, which is critical for the banking sector in the context of digitalization.

It should be noted that Ukraine is currently undertaking measures to adapt national standards to the GIAS, with the support of international programs such as *EU4PFM*. The goal of these initiatives is to assist in harmonizing standards, updating training programs, and strengthening quality control in internal auditing [3].

**Conclusions.**

The implementation of the Global Internal Audit Standards in the Ukrainian banking sector holds significant potential for strengthening the effectiveness of internal control. However, it requires a systemic approach, adequate resources, and active support from state and professional institutions.

Based on the above, it is considered that for the further integration of the GIAS into the practical activities of bank internal audit units, the following prerequisites must be met:

- development and implementation of methodological guidelines for applying the GIAS;
- approval of a list of key performance indicators for evaluating internal audit activities and development of a methodology for their calculation at the national level;
- updating the existing Internal Audit Regulations of individual banks in accordance with current internal audit standards (GIAS);
- conducting systematic training and professional development of internal auditors;
- ensuring adequate resources for the implementation of new audit procedures and technologies;
- integrating the standards into the daily practice of bank internal audit units.

**References**

1. National Bank of Ukraine (2016), Regulations on the organization of internal audit in banks of Ukraine № 311. Retrieved from: https://zakon.rada.gov.ua/laws/show/v0311500-16#Text [In Ukrainian]
2. International Internal Audit Standards Board (2024), Global Internal Audit Standards. Retrieved from: https://theiia.org.ua/wp-content/uploads/2024/12/global-internal-audit-standards-ukrainian.pdf[In Ukrainian]
3. EU4PFM (2025), Bridging the Gap: Ukraine's Push for Global Internal Audit Standards with EU4PFM. Retrieved from: https://eu4pfm.com.ua/news/bridging-the-gap-ukraines-push-for-global-internal-audit-standards-with-eu4pfm/
4. The Institute of Internal Auditors (2024), Chief Audit Executive's Guide to Domain III: Governing the Internal Audit Function. Retrieved from: https://www.theiia.org/globalassets/site/content/guidance/toolkits/chief-audit-executives-domain-iii-toolkit/standards_cae_guide_domain_iii_aln.pdf
5. Kasatkin, S. (2024), Global Internal Audit Standards. What has changed? Retrieved from: https://kpmg.com/ua/uk/blogs/home/posts/2024/04/hlobalni-standarty-vnutrishnoho-audytu-shcho-zminylosya.html[In Ukrainian]
6. Institute of Internal Auditors of Ukraine (2025), Position of Ukrainian public organization "IIAU" on the draft amendments to the laws of Ukraine relating to internal audit. Retrieved from: https://theiia.org.ua/2025/03/23/pozycziya-vgo-ivau-shhodo-proyektu-zmin-v-zakony-ukrayiny-yaki-stosuyutsya-vnutrishnogo-audytu/[In Ukrainian]
7. Skasko, O. & Dmyshko, Ya. (2023), Conducting an external assessment of the efficiency and quality of the bank's internal audit department. *Acta Academiae Beregsasiensis. Economics.* № 4. Retrieved from: https://doi.org/10.58423/2786-6742/2023-4-529-539[In Ukrainian]
8. Krutova, A. S. & Semenets, A. O. (2018), Regulatory and legal support for internal audit: domestic experience and world practice. *Biznes Inform.* № 12. Retrieved from: https://www.business-inform.net/export_pdf/business-inform-2018-12_0-pages-309_316.pdf[In Ukrainian]
9. Mukiibi, S. & Kabanda, R. (2025), Internal Audit Practices And Financial Performance Of Local Government. *Metropolitan Journal Of Academic Pedagogical Research.* Vol. 4 Issue 4, Pages 17-39. Retrieved from: https://www.researchgate.net/publication/391044993_Internal_Audit_Practices_And_Financial_Performance_Of_Local_Government_A_Case_Of_Nansana_Municipality/download
10. Male, K. & Irumba, A. (2025), Audit Practices And Financial Records Management: A Case Study Of Opportunity Bank Nakasero Branch Kampala. *Metropolitan Journal Of Business & Economics*. Vol. 4 Issue 4, Pages 410-420. Retrieved from: https://www.researchgate.net/publication/391060424_Audit_Practices_And_Financial_Records_Management_A_Case_Study_Of_Opportunity_Bank_Nakasero_Branch/download
11. Lenz, R., & O'Regan, D. J. (2024). The Global Internal Audit Standards – Old Wine In New Bottles? *EDPACS.* Vol. 69(3), Pages 1–28. https://doi.org/10.1080/07366981.2024.2322835
12. Shaban, O. S., & Barakat, A. I. (2023). Evaluation of Internal Audit Standards as a Foundation for Carrying out and Promoting a Wide Variety of Value-Added Tasks-Evidence from Emerging Market. *Journal of Risk and Financial Management*. Vol. 16(3), Pages 185. https://doi.org/10.3390/jrfm16030185

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**Перспективи впровадження глобальних стандартів внутрішнього аудиту в банківському секторі України: адаптація до міжнародних вимог і національних реалій**

***Анотація.*** Внутрішній аудит у банках є ключовим інструментом підвищення ефективності та стійкості банківської системи, забезпечуючи незалежну оцінку систем управління, контролю та управління ризиками. Діяльність підрозділів внутрішнього аудиту регламентується міжнародними стандартами, зокрема Глобальними стандартами внутрішнього аудиту (ГСВА) 2024 року, адаптованими до українських реалій.

**Постановка проблеми.** В умовах економічної нестабільності та зовнішніх викликів, зокрема воєнного стану, особливо актуальним стає питання гармонізації національних підходів до внутрішнього аудиту з міжнародними стандартами, що дозволить підвищити ефективність контролю, прозорість та довіру до банківської системи.

**Нерозв'язані аспекти.** Попри наявність нормативної бази, залишаються проблеми з ресурсним забезпеченням, рівнем кваліфікації кадрів, впровадженням сучасних технологій аудиту та готовністю керівництва банків до активної взаємодії з підрозділами внутрішнього аудиту. Недостатньо дослідженими є питання адаптації ГСВА до умов державного сектору.

**Мета статті.** Обґрунтувати перспективи впровадження ГСВА 2024 у банківському секторі України з урахуванням міжнародного досвіду, національних особливостей регулювання та актуальних викликів фінансової безпеки.

**Основний матеріал.** У статті проведено порівняльний аналіз структури та змісту ГСВА 2024 і попередніх стандартів, виокремлено п'ять розділів (доменів) нових стандартів, їх принципи, стандарти та рекомендації з впровадження. Проаналізовано труднощі адаптації вимог, зокрема у сфері ресурсного забезпечення, комунікації з наглядовими радами, впровадження KPI для оцінювання ефективності аудиту. Визначено практичні аспекти впровадження нових процедур, включно з підвищенням ролі внутрішнього аудиту у системі управління ризиками та підтримкою цифрової трансформації банків.

**Висновки.** Впровадження ГСВА 2024 у банківському секторі України має потенціал для суттєвого підвищення якості внутрішнього контролю, гармонізації з міжнародними стандартами та зміцнення довіри інвесторів. Для успішної реалізації необхідні методологічні рекомендації, чітка система показників ефективності, оновлення внутрішніх положень банків, належне фінансове та кадрове забезпечення, а також інтеграція стандартів у щоденну практику внутрішніх аудиторів.

***Ключові слова:*** *внутрішній аудит, Глобальні стандарти внутрішнього аудиту, банківський сектор, управління ризиками, міжнародні стандарти, фінансова безпека.*

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**Література**

1. Положення про організацію внутрішнього аудиту в банках України : Постанова Нац. банку України від 10.05.2016 р. № 311. URL: https://zakon.rada.gov.ua/laws/show/v0311500-16#Text
2. Глобальні стандарти внутрішнього аудиту 2024. International Internal Audit Standards Board. URL: https://theiia.org.ua/wp-content/uploads/2024/12/global-internal-audit-standards-ukrainian.pdf
3. Bridging the Gap: Ukraine's Push for Global Internal Audit Standards with EU4PFM. URL: https://eu4pfm.com.ua/news/bridging-the-gap-ukraines-push-for-global-internal-audit-standards-with-eu4pfm/
4. Chief Audit Executive's Guide to Domain III: Governing the Internal Audit Function (2024). The Institute of Internal Auditors. URL: https://www.theiia.org/globalassets/site/content/guidance/toolkits/chief-audit-executives-domain-iii-toolkit/standards_cae_guide_domain_iii_aln.pdf
5. Касаткін С. Глобальні стандарти внутрішнього аудиту. Що змінилося? URL: https://kpmg.com/ua/uk/blogs/home/posts/2024/04/hlobalni-standarty-vnutrishnoho-audytu-shcho-zminylosya.html
6. Позиція ВГО "ІВАУ" щодо проєкту змін в закони України, які стосуються внутрішнього аудиту. URL: https://theiia.org.ua/2025/03/23/pozycziya-vgo-ivau-shhodo-proyektu-zmin-v-zakony-ukrayiny-yaki-stosuyutsya-vnutrishnogo-audytu/
7. Скаско О., Дмишко Я. Проведення зовнішньої оцінки ефективності та якості роботи підрозділу внутрішнього

аудиту банку. *Acta Academiae Beregsasiensis. Economics.* 2023. № 4. URL: https://doi.org/10.58423/2786-6742/2023-4-529-539

8. Крутова А. С., Семенець А. О. Нормативно-правове забезпечення внутрішнього аудиту: вітчизняний досвід та світова практика. *Бізнес Інформ.* 2018. № 12. URL: https://www.business-inform.net/export_pdf/business-inform-2018-12_0-pages-309_316.pdf
9. Mukiibi S. and Kabanda R. (2025) Internal Audit Practices And Financial Performance Of Local Government. *Metropolitan Journal Of Academic Pedagogical Research.* Vol. 4 Issue 4, April- 2025, Pages 17-39. URL: https://www.researchgate.net/publication/391044993_Internal_Audit_Practices_And_Financial_Performance_Of_Local_Government_A_Case_Of_Nansana_Municipality/download
10. Male K. and Irumba A. (2025). Audit Practices And Financial Records Management: A Case Study Of Opportunity Bank Nakasero Branch Kampala. *Metropolitan Journal Of Business & Economics*. Vol. 4 Issue 4, April- 2025, Pages: 410-420. URL: https://www.researchgate.net/publication/391060424_Audit_Practices_And_Financial_Records_Management_A_Case_Study_Of_Opportunity_Bank_Nakasero_Branch/download
11. Lenz, R., & O'Regan, D. J. (2024). The Global Internal Audit Standards – Old Wine In New Bottles? *EDPACS.* Vol. 69(3), Pages 1–28. DOI: https://doi.org/10.1080/07366981.2024.2322835
12. Shaban, O. S., & Barakat, A. I. (2023). Evaluation of Internal Audit Standards as a Foundation for Carrying out and Promoting a Wide Variety of Value-Added Tasks-Evidence from Emerging Market. *Journal of Risk and Financial Management*. Vol.16(3), Pages 185. DOI: https://doi.org/10.3390/jrfm16030185

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# Фінанси, облік, аудит та оподаткування

# Finance, accounting, audit and taxation

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## Conditions and determinants of digital transformation of financial services market participants

***Abstract.***

**Introduction.** The country's financial system is considered to be the true heart of the national economy, ensuring effective cash flow management and financial and economic stability, facilitating investment and creating conditions for its further development.

**Statement of the problem.** The financial sector is characterized by constant transformations, which are driven, among other things, by the country's gradual transition to a digital economy. This creates a need for financial services market participants to transform their business processes based on the active implementation and advanced use of digital technologies.

**Unresolved aspects.** The theoretical basis of the study is the work of modern foreign and domestic researchers devoted to the study of the impact of digitalization processes on the functioning of the economy and its financial sector, as well as certain aspects of digital transformation at different levels of socio-economic systems.

**Purpose.** The purpose of the study was to identify key markers of the development of fintech companies in Ukraine and to build a deterministic conceptual model of digital transformation of financial services market participants.

**Objectives and research methods (main material).** The object of the study is the financial sector of Ukraine's economy and financial services market participants, in particular, fintech companies. The article examines certain indicators of the functioning of financial banking and non-banking services market participants in Ukraine in the context of the country's strategic course towards digitalization. The determinants are identified and a determinant conceptual model of digital transformation of financial services market participants is built.

The study used statistical and dynamic analysis methods, methods of logical generalization, and applied a deterministic approach to building a conceptual model of digital transformation of financial services market participants.

**Conclusions. Research results.** Based on open analytical materials, the key markers of the development of fintech companies in Ukraine are identified in terms of parameters characterizing their human resources, the spread of the Internet and innovations, the level of digital quality of life, the contribution of IT services to GDP, the dynamics of the number of market participants, their financial condition and performance, localization and access to the global arena. The determinants of digital transformation are identified, namely: digital context, digital adoption, digital vision, digital competence, digital management, and digital maturity. The conducted research creates the basis for making and implementing management decisions at the level of individual participants in the financial services market regarding the digital transformation of activities.

***Keywords:*** *digital economy, digitalization, digital transformation, financial sector, financial services market, fintech companies, deterministic approach*

Formulas: -, fig.: 1, tabl. 3, bibl.: 37.

**JEL G21, G28, O32, O33, L86**

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**Introduction.** The transition to the digital economy is an officially defined direction of qualitative transformations in Ukraine's economy and society, including at the state level. Digitalization has a significant impact on the functioning of various sectors of the national socio-economic system. The financial sector is also experiencing the impact of the active spread of digital technologies.

Analytical studies conducted by the Ukrainian Association of Fintech and Innovation Companies have identified key technological trends in the development of the financial services market, linking them to technologies that are changing the financial sector, digital services for SMEs, and the spread of a wide range of digital financial services that provide first-class payment services to residents [1]. These trends are related to the impact on the financial sector of modern digital technologies such as artificial intelligence and machine learning, blockchain, big data analytics, the Internet of Things, regulatory technologies, and cloud computing.

Digital technologies open up new opportunities for financial services market participants, but require them to fundamentally transform their business processes. In this context, an interesting research question arises regarding the determinants of digital transformation in the financial sector that operate at the company level and contribute to the relevant transformations.

**Literature review.** The study of digitalization processes, their preconditions, features and consequences has recently received much attention both in the domestic scientific community and among foreign researchers.

For example, Berdar M., Butenko N., Hatska L., Sagaydack J., Semenova D., considering the main areas of digitalization implementation, argue that the digitalization of business processes

contributes to various economic opportunities that an enterprise can realize in its activities, while requiring certain transformations [2].

Zaika O. argues that digital transformation has become one of the main driving forces for the development of the financial sector, radically changing its structure and functioning. Modern innovative technologies, such as artificial intelligence, cloud services, the Internet of Things, big data analytics, and blockchain, provide an opportunity to introduce new approaches to managing financial processes, contributing to increased efficiency, reduced costs, and improved customer service [3].

Sunduk T., Babenko-Levada V., Skorba O., Chornovol A. believe that the development of financial innovations has led to the destruction of traditional business models and established models of consumer relations. Scientists study the latest financial technologies, their features, the main drivers of the development of digital services for financial infrastructure and come to the natural conclusion that increased competition requires traditional financial institutions to use new digital technologies, improve financial products and change business models [4].

Danylyshyn V., Synytsia S. consider digitalization in the financial services market as a process of transition from the traditional system of financial services provision to the use of modern digital technologies [5]. The introduction of digital technologies, in their opinion, requires changes in the models of functioning of market participants.

Kovalova O., Kucherevskyi A. note that the rapid development of the digital economy has become a global trend that covers the entire structure of economic relations and, in particular, the financial market [6]. According to them, the spread of new digital financial technologies leads to the emergence of new directions for the development of the financial sector in the market.

Ponomarenko I., Rudiuk L. study the main financial technologies that are becoming increasingly widespread in the financial sector in the context of its digitalization. They emphasize that the financial technology market is developing inextricably linked to the processes of digitalization and requires the constant involvement of appropriate innovative technologies to ensure a high level of loyalty of the target audience [7].

Malyshko Ye. studies the main directions, advantages and disadvantages of digitalization in the financial market. The author has established that the transformation processes taking place in the economy and the introduction of information technology will increase the competitiveness of business processes in the enterprise [8]. The author associates the development and implementation of digital innovations with ensuring the effectiveness of strategic actions and further changes in the activities of enterprises.

In their study on identifying trends in the digitalization of the global financial services market, such domestic scholars as Kholiavko N., Tarasenko A., and Kolotok M. examine the essence of the concept of digitalization, characterize information technologies used in the financial services market, and define a conceptual scheme of partnership between financial institutions and IT and fintech companies. Scientists note that, compared to world leaders, the domestic market is characterized by an average pace of implementation of information technologies in the activities of financial institutions, linking this to certain factors-disincentives [9].

Working on the problem of identifying the features of digital transformation in financial services and the fintech segment, a researcher such as Nwoke J. concludes that these segments of the financial sector of the economy have made significant progress in the introduction and distribution of digital banking products focused on increasing the accessibility and efficiency provided by these innovations [10].

Jabeen M., Jabeen B., Kausar A., conducting a local study of the relationship between digital finance and the digital landscape within their country, emphasize that digital finance is changing the business landscape, promoting financial inclusion, stimulating digital transformation and innovation [11]. According to their conclusions, the benefits of using digital financial solutions extend to all sectors, especially to the operation of small and medium-sized enterprises, e-commerce, and startups.

Based on the analysis of statistical data, Yelisieieva O. and Peretiatko A. conclude that certain prerequisites contribute to the formation of the fintech ecosystem in Ukraine: creation of proper infrastructure; formation of a favorable legislative and regulatory environment; ensuring access to capital and investment; availability of a sufficient level of qualification and innovative potential of employees [12].

Kandpal V., Ozili P.K., Jeyanthi M.P., Ranjan D., Chandra D. in their study identify the following driving forces for the introduction of digital finance: technological progress, changing consumer behavior, financial inclusion, regulatory support, fintech innovation and partnerships [13]. All of these driving forces encourage financial sector entities to undergo transformations that can even be revolutionary.

Feyen E., Frost J., Gambacorta L., Natarajan H., Saal M. also conclude that digital innovations bring economic benefits and significant changes in the production of financial services, resulting in a change in their structure, which helps financial companies to increase efficiency and competitiveness [14].

Despite all the positive impacts of digitalization, some scholars emphasize the challenges associated with it. For example, Soroka B. notes that the digitalization of the financial market of Ukraine is associated, among other things, with the formation of a number of risks for its individual participants. Such risks are determined by insufficient financial inclusion, low financial literacy and imbalances in state regulation [15].

Carstens A., Claessens S., Restoy F., Shin H. S., analyzing the impact of digital technologies on the financial sector, note the transformation of business models of sector participants and the emergence of new business models, such as large technology companies. This is a manifestation of digital transformation in the sector, which, according to the authors, requires revision and improvement of regulations [16].

Interesting is the research of such scientists as Bontadini F., Filippucci F., Jona-Lasinio C., Nicoletti G., Saia A., who study the possibilities of measuring the spread of digital technologies in the financial sector, the impact of digitalization of financial services on the economy, ways to enhance the digital transformation of the financial sector through better regulation, better skills, better infrastructure and more innovation [17].

Ha L. T. empirically studies the relationship between digital transformation and financial development. The author proposes to measure digitalization in terms of digital connectivity, Internet use, e-business, e-commerce, and e-government [18]. The study emphasizes the importance of digital transformation for increasing the depth and efficiency of financial markets.

Tkachuk N., studying the state and prospects of digitalization of the financial and economic sphere in Ukraine, argues that modern policy directions in the digitalization of the economy and society should be based on comprehensive methods [19]. The main goal of these methods is digital transformation, in particular in the financial sector.

Digitalization and the digital transformation caused by it are associated by some scholars with other related processes and phenomena.

In particular, Bondarchuk O. in his study systematizes the evolution of the concept of “digital adoption”, proposes a three-stage model of adoption (technology, software, user) and justifies its impact on intellectual capital, organizational maturity and competitiveness of the firm [20].

Shreeti V. notes that in recent decades, the expansion of Internet access has contributed to economic development, especially in emerging markets, and emphasizes the key role of technology adoption in bridging the existing digital divide [21]. At the same time, Skare M., Soriano D.R., considering digitalization and the development of digital technologies in the international context, study how the adoption of digital technologies is influenced by globalization and related changes in society [22].

Adiguzel Z., Aslan B., Sonmez F. emphasize the importance of forming a strategic vision in the context of the spread of digital technologies. They believe that strategic digitalization and digital innovation have a positive impact on the financial and innovative performance of companies [23].

In the context of digitalization and the associated digital transformation of business processes in companies, the need to form and deepen digital competencies is becoming more acute. For example, Y. Shestack, Y. Biliavska, V. Osetskyi, N. Mykytenko, Y. Umantsiv rightly emphasize that the application of digital competencies will allow making optimal decisions in the process of applying digital skills, while ensuring the uniqueness of digital literacy in business management [24].

A similar position can be traced in the study by Erceg V., Zoranovic T. The authors note that in order to successfully implement digital transformation and survive in the global market, companies must have sufficient intellectual capital. In addition to technical skills, employees will need to adapt to a new digital strategy, organizational structure, and business culture [25]. A similar position is taken by Danieliene R., Tolmach M. [26]

Some authors emphasize that companies implementing digital technologies must have a sufficient level of digital maturity and be ready for such changes and transformations. Thus, Denchyk I. proposes an economic tool for assessing the digital maturity of organizations, which takes into account both internal and external factors using quantitative indicators [27].

In addition, it is reasonable to assume that a digital management system should be developed and implemented for successful digital transformation. Bygstad B., Iden J. emphasize the difference between digital management and IT management. They argue that digital management is the responsibility of all managers for the competent use of digital resources for business purposes. Digital management means planning, organizing, directing, and subsequently controlling these resources using their unique features and dynamics [28].

It should be noted that Ukraine has adopted a number of strategic documents [29-31] aimed at the development of digital technologies, and the Ukrainian Association of Fintech and Innovative Companies operates, whose analytical materials can provide a basis for understanding current trends in the financial sector [1; 32-35]. Some statistics on the development of the financial sector and analytical studies in the field of digital transformation management are also of interest [36-37].

Despite the fact that certain aspects related to the spread of digital technologies in the financial sector of the economy have been sufficiently studied, most studies either provide a general idea of digitalization and digital transformation or approach these concepts from the perspective of structural and process approaches. In our opinion, the deterministic approach to the study of digital transformation is more interesting and should be given more attention in modern research.

**Purpose, objectives and research methods.** The study is aimed at identifying key markers of the development of fintech companies in Ukraine and building a deterministic conceptual model of digital transformation of financial services market participants.

The study covered the following tasks:

- to study certain indicators of the financial sector and identify key markers of the development of fintech companies in Ukraine in the context of the country's strategic course towards digitalization;
- to identify the determinants of digital transformation of financial services market participants and build a deterministic conceptual model of digital transformation.

The study used statistical and dynamic analysis methods to review certain indicators of the functioning of financial services market participants in recent years, methods of logical generalization to identify key markers of the development of fintech companies in Ukraine, and a deterministic approach to building a conceptual model of digital transformation of financial services market participants.

**Research results.** The financial sector is a component of the economy, on the stability of which the development and competitiveness of the national socio-economic system largely depend. Like any component of an open and dynamic system, such as the national economy, the financial

market is constantly changing and transforming. In particular, this is reflected in changes in certain performance indicators of financial sector participants, such as banks and non-bank financial services market participants (Table 1).

*Table 1. Selected Performance Indicators of Ukrainian Financial Sector Participants (Banks and Non-Banking Financial Services Market Participants)*

| Indicators | At the end of the year | | | | |
|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | 2024 |
| Number of registered market participants, units | | | | | |
| banks | 73 | 71 | 67 | 63 | 61 |
| insurance companies | 210 | 155 | 128 | 101 | 65 |
| credit unions | 322 | 278 | 162 | 133 | 104 |
| financial companies | 1020 | 935 | 760 | 559 | 479 |
| pawnshops | 302 | 261 | 183 | 146 | 109 |
| Assets of market participants, UAH million | | | | | |
| banks | 1822841 | 2053232 | 2351678 | 2945030 | 3414920 |
| insurance companies | 64920 | 64209 | 70298 | 74412 | 72819 |
| credit unions | 2317 | 2279 | 1449 | 1422 | 1266 |
| financial companies | 182130 | 198689 | 243456 | 250442 | 310262 |
| pawnshops | 3867 | 3034 | 4101 | 3847 | 4131 |
| Average assets per organization, UAH million | | | | | |
| banks | 24970.4 | 28918.8 | 35099.7 | 46746.5 | 55982.3 |
| insurance companies | 309.1 | 414.3 | 549.2 | 736.8 | 1120.3 |
| credit unions | 7.2 | 8.2 | 8.9 | 10.7 | 12.2 |
| financial companies | 178.6 | 212.5 | 320.3 | 448.0 | 647.7 |
| pawnshops | 12.8 | 11.6 | 22.4 | 26.3 | 37.9 |

*Source: compiled by the author based on data from the National Bank of Ukraine [36].*

As can be seen from Table 1, the banking sector of the financial services market is represented by a relatively small number of participants (compared to the total number of participants in the non-banking financial services market). At the end of 2024, there were 61 banks operating in Ukraine, while the total number of insurance and financial companies, pawnshops, and credit unions amounted to 757, which is 12.4 times the number of banking institutions. At the same time, the banking sector has the largest concentration of assets. Thus, as of the end of 2024, the assets of banks amounted to UAH 3414920 million, while the total assets of insurance and financial companies, pawnshops, and credit unions amounted to only UAH 388478 million (8.8 times less than in the banking sector). Thus, the banking sector retains its leading position in the financial services market.

As for the dynamics of the indicators shown in the table, the number of financial services market participants registered in Ukraine (both banking and non-banking) has been steadily declining during the period under review, while the total value of assets of such organizations (except for credit unions, whose asset value has decreased) has been growing.

Thus, in 2020-2024, the number of banks in Ukraine decreased by 16.4%, while bank assets increased by 87.3%. Among non-bank financial services market participants, the decline was much more pronounced. In addition, it should be noted that the rate of decline in the number of insurance companies, credit unions, and pawnshops was similar. Thus, the number of pawnshops decreased by 63.9%, credit unions by 67.7%, and insurance companies by 69.0%. As for the number of financial companies, the decline in this indicator was slower - by only 53.0% in 2020-2024. At the same time, while the assets of credit unions decreased by 45.4% during the study period, the assets of other nonbank financial services market participants grew. In particular, the assets of pawnshops

increased by 6.8%, the assets of insurance companies by 12.2%, and the assets of financial companies by 70.4%.

It is interesting to trace the dynamics of changes in the average value of assets of financial services market participants per institution. Insurance and financial companies were characterized by the highest growth rates of assets per institution. For these market participants, the value of assets per institution increased by 3.6 times in 2020-2024. Assets per pawnshop increased almost 3 times, and assets per bank increased 2.2 times. Average assets per credit union grew the least dynamically, by 1.7 times.

These changes show that in order to survive in the financial services market, existing participants must constantly increase their financial potential while optimizing internal and external processes. This will allow them to successfully compete with other market participants.

A number of opportunities for optimizing business processes of financial services market participants are generated by the spread of digital technologies in society, which are actively penetrating all spheres of life.

In the context of Ukraine's course towards comprehensive digitalization, the Strategy for Digital Development of Innovative Activities of Ukraine for the Period up to 2030 was approved in 2024, which aims to create new opportunities for Ukrainians as citizens, Ukrainians as entrepreneurs, investors, scientists, researchers and innovators [29].

The document states: "At the beginning of 2021, digital development in Ukraine showed positive changes, but the overall level of digitalization remained lower compared to leading European countries. Indicators of access to high-speed Internet, integration of digital tools in business and public services indicated the need for significant investment and reform. During the new stage of the Russian Federation's armed aggression against Ukraine, the digital infrastructure was hit numerous times, which worsened the situation. However, in response to the challenges, the country continued to actively develop digital solutions, which has become an important element of life support in the context of armed aggression" [29].

"The Strategy for Digital Development of Innovation Activities of Ukraine for the Period up to 2030 defines the vision of Ukraine as a country of innovation, where an ecosystem has been created for the free development of breakthrough ideas as the basis for economic development and provides for the achievement of security, political, economic, social and digital goals. The latter is that Ukraine should become a state with a powerful digital economy that supports entrepreneurship, provides effective digital services that minimize corruption risks at any level [29].

Thus, given the proliferation of digital technologies in society and the national policy to build a digital economy, most institutions and organizations see digital transformation as a way to improve their performance and ensure competitiveness.

With the spread of digital technologies in the financial sector, the term fintech has emerged to refer to services or companies that use the latest digital and Internet technologies in the banking and financial services industry. According to the Ukrainian Association of Fintech and Innovative Companies, the fintech ecosystem is an infrastructure consisting of fintech companies, banking and non-banking financial institutions, and government agencies.

Recently, Ukrainian analysts have been systematically conducting research in the field of fintech. Among such studies, it is worth noting the Ukrainian Catalog of Fintech Companies, which is prepared by specialists of the Ukrainian Association of Fintech and Innovation Companies with the support of a number of partners.

In particular, the Ukrainian Catalog of Fintech Companies 2024 [33] is a product of the Ukrainian Association of Fintech and Innovation Companies, prepared with the support of the Ministry of Digital Transformation, the National Bank of Ukraine, the International Finance Corporation (IFC) in partnership with the Swiss State Secretariat for Economic Affairs (SECO) and the UK Government's Good Governance Foundation in Ukraine (GGF) and the Ukrainian Startup Fund.

The data from the 2021, 2023, and 2024 catalogs of Ukrainian fintech companies allow us to analyze the change in the structure of fintech companies by field of activity (Table 2).

*Table 2. Changes in the structure of fintech companies by areas of activity*

| Field of activity | Share in the structure of fintech companies, %. | | | |
|---|---|---|---|---|
| | 2020 | 2021 | 2023 | 2024 |
| Technology and Infrastructure | 20 | 22 | 24 | 36 |
| Payments / Money transfer | 20 | 19 | 14 | 15 |
| Personal and Consumer lending | 7 | 14 | 12 | 7 |
| Regtech | 2 | 1 | 7 | 6 |
| Personal finance / Wealth management | 3 | 6 | 6 | 5 |
| Cyber security / Anti-fraud | 5 | 5 | 2 | 4 |
| Business lending | 4 | 1 | 1 | 4 |
| Legaltech | 3 | 9 | 7 | 4 |
| Digital / Neobanks | 4 | 4 | 7 | 4 |
| Consulting / Analytical Systems | 9 | 5 | 2 | 3 |
| Insurtech | 3 | 6 | 6 | 3 |
| Marketplace | 5 | 2 | 5 | 3 |
| Block chain / Crypto | 4 | 3 | 5 | 2 |
| Electronic wallets / Mobile wallets | 10 | 2 | 2 | 2 |
| Fintech investment | - | - | - | 1 |
| Digital Comparison Tool | 1 | 1 | - | - |

Notes: There is no research for 2022.
*Source: compiled by the author based on data from [33-35].*

As can be seen from Table 2, Technology and Infrastructure traditionally has the highest share in the structure of fintech companies (20% in 2020, 36% in 2024). The second and third places are taken by Payments/Money transfer (20% in 2020, 15% in 2024), Personal and Consumer lending (7% in both 2020 and 2024). According to 2024 data, such fintech areas as Regtech and Personal finance / Wealth management will also have a 5% share or more. Cyber security / Anti-fraud, Business lending, Legaltech, Digital / Neobanks have 4% each. Consulting / Analytical Systems, Insurtech and Marketplace have a 3% share, Blockchain / Crypto and Electronic wallets / Mobile wallets - 2%. In 2024, 1% of fintech companies also worked in the field of Fintech investment.

In addition, according to the catalogs, we can identify key markers of the development of Ukrainian fintech companies in the context of intensifying digital transformation.

*Table 3. Key markers of the development of fintech companies in Ukraine in the context of intensifying digital transformation*

| **Parameter** | **Catalog of Fintech Companies of Ukraine 2021** | **Catalog of Fintech Companies of Ukraine 2023** | **Catalog of Fintech Companies of Ukraine 2024** | **Key marker of fintech companies development** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| Human resource potential | 212.6 thousand IT professionals | 307.0 thousand IT professionals | 346.2 thousand IT professionals | Strengthening human resources, increasing the number of IT professionals |
| Internet penetration | 29.5 million regularly use the Internet (estimated at 71.4%) | 31.2 million regularly use the Internet (estimated at 76.2%) | 80% regularly use the Internet | Increase in the share of regular Internet users |
| Innovation penetration | - | 57th place in the ranking of the most innovative countries in the world | 55th place in the ranking of the most innovative countries in the world | Focus on innovative development, improvement of the country's position in terms of the spread of innovations |

*Table 3. (continued)*

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Digital quality of life | 47th in digital quality of life in the world | 50th in digital quality of life in the world | 46th in digital quality of life in the world | Ensuring a high digital quality of life |
| Contribution of IT services to GDP | - | 3.5% of IT services exports in GDP | 4.0% of IT services exports in GDP | Ensuring the development of IT services as a sector that can and should make a significant contribution to GDP |
| | 4.8% share of IT services in GDP | - | - | |
| Market participants | 203 companies | 246 companies | 256 companies | Continuous expansion of the fintech market |
| Financial position and performance | 65% are financed exclusively by their own funds, 73% have passed the break-even point | 66% are financed exclusively by their own funds, 68% have passed the break-even point | 79% are financed exclusively by their own funds, 75% have passed the break-even point | Self-sufficiency of most fintech companies, their financial success |
| Localization | 79% are based in Kyiv | 77% are based in Kyiv | 79% are based in Kyiv | Concentration around major innovation centers (especially in the capital) |
| Entering the global arena | 49% operate on the international market | 33% operate on the international market | 47% operate on the international market | High share of companies operating on the international market |

Notes: There is no research for 2022.
*Source: compiled by the author based on data from [33-35].*

The 2021, 2023, and 2024 Catalogs of Ukrainian FinTech Companies provide analytical and statistical information that allows us to characterize the human resources potential in the field of fintech in Ukraine, the spread of the Internet, the spread of innovations, the level of digital quality of life, the contribution of IT services to GDP, fintech market participants, their financial condition and performance, localization, and access to the global arena.

According to the table, one of the key markers of the development of fintech companies in Ukraine is the strengthening of human resources, which is manifested in the constant growth of the number of IT specialists (according to the Catalog of Ukrainian fintech companies in 2021, 212.6 thousand specialists worked in the field of IT in Ukraine, according to the Catalog of 2022 - 307.0 thousand, according to the Catalog of 2024 - 346.2 thousand specialists).

The share of regular Internet users is also steadily increasing. Thus, according to the 2021 data characterizing the spread of the Internet, 29.5 million people (estimated 71.4%) regularly used the Internet, and according to the 2023 data - 31.2 million people (76.2%). According to a similar study in 2024, the share of the population that regularly uses the Internet in Ukraine is 80%.

Another key marker of the development of fintech companies in Ukraine is the country's focus on innovation, improving the country's position in terms of the spread of innovation. According to the 2023 and 2024 catalogs of fintech companies in Ukraine, Ukraine has improved its position in this parameter, moving from 57th to 55th place.

Ensuring a high digital quality of life can also be considered a key marker for Ukraine (47th place in the world according to the Ukrainian Fintech Catalog 2021, 50th place - according to 2023, 46th place - according to 2024).

The contribution of IT services to GDP formation in the 2021 catalog is characterized by the share of IT services in GDP, which amounted to 4.8%. In 2023-2024, analysts of the Ukrainian Association of Fintech and Innovation Companies used a different indicator - the share of IT services exports in GDP, which was 3.5% and 4.0%, respectively. It should be noted that the key marker of fintech companies' development should be the development of IT services as a field of activity that can and should make a significant contribution to GDP.

According to the Ukrainian Association of FinTech and Innovative Companies, the market consisted of 203 companies in 2021, 246 companies in 2023, and 256 companies in 2024, indicating a steady expansion of the market.

In 2024, analysts of the Ukrainian Association of Fintech and Innovation Companies noted that 79% of fintech companies are financed exclusively at their own expense, and 75% have passed the break-even point (for comparison, according to 2021, these figures were 65% and 73%, according to 2024 - 66% and 68%, respectively).

The fintech market is characterized by a concentration around large innovation centers, which is why there is a significant share of fintech companies based in Kyiv, which is the country's leading innovation center. According to the latest data, about 79% of all fintech companies are based in Kyiv.

Another key marker of the functioning of the fintech sector is the high share of companies entering the global market (47% according to the 2024 study).

These markers indicate that the fintech services market is gradually and steadily developing.

Until 2023, Ukraine had the Fintech Development Strategy in Ukraine until 2025 approved by the National Bank of Ukraine, a step-by-step plan for creating a full-fledged fintech ecosystem with innovative financial services and accessible digital services in Ukraine. The strategy is focused on building a sustainable model of the future Ukrainian fintech ecosystem integrated into the global landscape. It was supposed to create institutional and investment conditions for the development of digital services, as well as stimulate demand for innovative financial products and promote the development of talent in the market [31].

Analysts attributed the success of the “Strategy for the Development of Fintech in Ukraine until 2025” to the implementation of related digital projects, including the introduction of remote identification and verification, the implementation of the PSD2 European Directive, the possibility of making instant payments from account to account in the EPS 24/7; strengthening the regulatory perimeter in the field of cybersecurity and other innovative projects of the central bank.

Currently, the National Bank of Ukraine, the National Securities and Stock Market Commission, the Ministry of Finance of Ukraine, and the Deposit Guarantee Fund have developed a new “Strategy for the Development of the Financial Sector of Ukraine” focused on countering Russian aggression and rebuilding the country. The Strategy was approved by the Financial Stability Council on July 19, 2023, and replaced the pre-war Strategy for the Development of the Financial Sector of Ukraine until 2025 [30].

The strategy includes five goals: macroeconomic stability, financial stability, financial system working for the country's recovery, modern financial services, and institutional capacity of regulators and the Deposit Guarantee Fund.

One of these strategic goals (namely, the strategic goal “Modern Financial Services”) is directly related to the digital transformation of the financial sector, as it provides for the implementation of the following initiatives:

- Development of digital financial services infrastructure.
- Automation and paperless technologies for the provision of financial services.
- Regulation of virtual assets.
- Digital defense of the financial sector.
- Restoration of financial infrastructure [30].

Thus, it is safe to say that digital transformation is becoming not just one of the possible ways to improve the financial market as a whole and individual participants in the financial services market, but a real cornerstone of further development of the financial sector of the economy.

Discussion. In studying digital transformation, researchers often use a structural approach, which consists in studying the components of digital transformation, or a process approach, which consists in considering digital transformation as a process and specifying its individual stages.

In our opinion, it is advisable to apply a deterministic approach to the conceptualization of digital transformation. This approach can be successfully applied in various areas of the national economy, including in relation to financial sector participants.

If we talk about transformation in a general sense, regardless of digital development, the transformation of any entity implies:

- the existence of certain external prerequisites for transformation to become possible;
- awareness of the expediency of change to gradually improve one's position;
- understanding of incentives and motives - possible positive consequences of change for this entity;
- availability of potential opportunities for such transformations;
- having a real ability to transform potential opportunities into desired results;
- drawing up appropriate action plans and their direct implementation.

With regard to digital transformation, the listed determinants can be presented using the appropriate terminology as follows:

- digital context;
- digital adoption;
- digital vision;
- digital competence;
- digital maturity;
- digital management (Fig. 1).

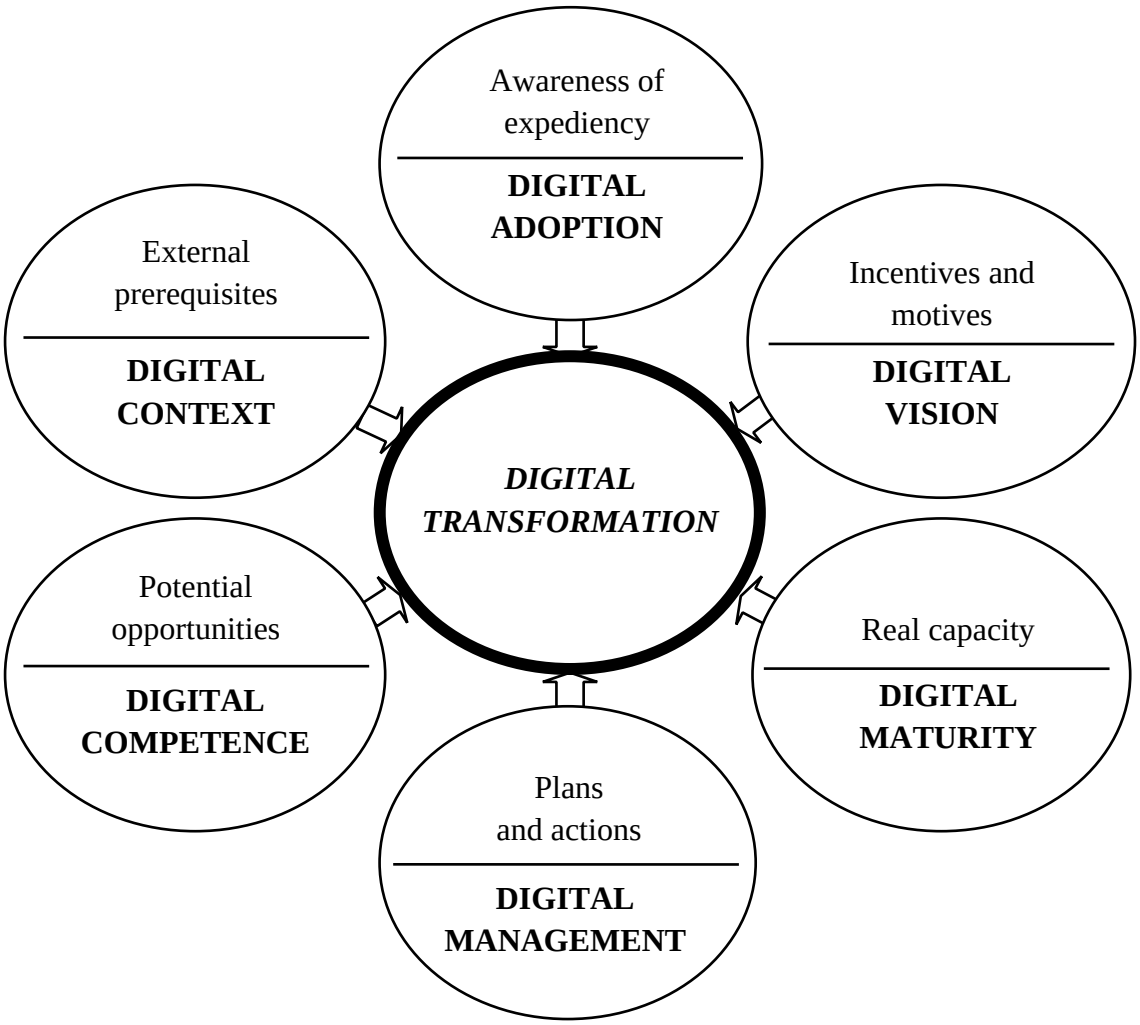


*Figure 1. Determinant Conceptual Model of Digital Transformation of Financial Market Participants*
*Source: developed by the author.*

This approach allows us to trace the cause-and-effect relationships between the determinants of digital transformation.

Thus, digital transformation becomes possible only if there is an appropriate digital context, which is the development of digital technologies in society. Modern companies operate in the context of intensified digitalization processes. Berdar M., Butenko N., Hatska L., Sagaydack J. and Semenova D. emphasize: "In today's environment, it is not enough for enterprises to simply produce a quality product and occupy a certain niche to stay afloat and make a profit. Focusing on innovative development and structural changes is a prerequisite for success, which, in turn, should include the digitalization of all production processes." [2].

Ha L.T. claims that “digitalization has a positive and statistically significant impact on the development of both financial markets and institutions” [18] According to Bontadini F., Filippucci F., Jona-Lasinio S., Nicoletti G., Saia A., "The growing role of digital technologies in the financial sector goes beyond their direct impact on financial services. By lowering the costs of financial transactions, promoting inclusive access to finance, and reducing frictions in financial markets, the digitalization of the financial sector can unlock the potential for innovative firms to thrive, creating a virtuous circle that not only supports individual businesses but also serves as a catalyst for increased aggregate productivity." [17].

It is the emergence and spread of digital technologies and the transformations they bring to various spheres of life that create the conditions for the digital transformation of a single company. In the financial sector, the digital context has two poles. First, the development of digital technologies makes innovative financial instruments and technologies available to financial sector participants that can be used to optimize business processes. Second, digitalization contributes to changes in the preferences and demands of financial services users, which encourages market participants to find new solutions to improve their operations.

External conditions encourage companies to identify the level of digital technologies in their internal and external business processes and to realize the feasibility of their transformation through more active use of digitalization achievements. In our opinion, this is a manifestation of digital adoption, because without the adoption of digital technologies by the company's management and its transmission to all employees, without their understanding of the feasibility of changes, the introduction of digital technologies will most likely be nominal or ineffective.

The decisive role of digital adoption in the process of digital transformation is emphasized, in particular, by Bondarchuk O. The author sees the purpose of digital adoption in the integration of digital tools into the production and management processes of the enterprise, the end state of which is the targeted use of these tools by all involved entities [20].

As Shreeti V. rightly notes: "Internet digitization has ushered in a new wave of economic development in emerging markets, but persistent digital divides still deprive many people of the opportunity to take advantage of their benefits. To reduce these gaps, it is important to understand the factors that shape the adoption of digital technologies" [21]. The importance of adopting digital technologies in society is also emphasized by Skare M., Soriano D.R.

Realizing that the use of digital technologies and the transformation of the company's business processes on this basis are vital, the management structures of the business entity should form a digital vision that defines the main goal of the company's digital transformation and, therefore, provides an understanding of what expected results can be achieved through the deployment of transformations. This is a powerful incentive and motive for the active implementation of digital technologies in the company's activities.

Digital vision is a transformational approach that integrates technology with business goals. Organizations use digital technologies to improve efficiency and attract customers. This strategic alignment fosters innovation and drives growth. A clearly defined Digital Vision outlines future digital opportunities, enabling businesses to thrive in a competitive environment. [37]

As rightly noted in Adiguzel Z., Aslan B., Sonmez F., "Companies that are engaged in digital innovation transformation gain a competitive advantage over other companies and offer opportunities to expand their product and service portfolio into new areas. However, companies that want to manage digital innovation must understand the unique characteristics of digital innovation processes" [23]. That is why it is so important to form a digital vision of the company, define the guidelines and directions of digital development.

At the same time, even a defined digital vision cannot guarantee a successful digital transformation without the presence of digital competencies in the company and its employees, which create potential opportunities for the implementation and effective use of digital technologies.

Shestack Y., Biliavska Y., Osetskyi V., Mykytenko N., Umantsiv Y. note: “In the era of digitalization, digital skills and digital literacy play a key role, characterized by the ability to apply modern software products, communication tools and information technologies in practice” [24].

A similar opinion is expressed by other researchers. In particular, Erceg V., Zoranovic T. believe that the success of digital business transformation is largely determined by the competencies of the digital strategy implementer who nurtures digital culture and is able to change the existing or create a new business model. [25]

At the same time, the availability of digital competencies, although an essential condition for the successful implementation of digital technologies, is not sufficient, in our opinion. It is necessary that an entity is ready for transformation, i.e., has such a defining characteristic as digital maturity.

In this context, the opinion presented in the paper by Danieliene R., Tolmach M. seems to be appropriate. The authors emphasize that "technology has not come to compete with humans, but to help make them even more efficient and productive. In order for this tandem to be successful, a person needs to undergo a personal transformation, adapt to new realities and learn to live in them, using all their privileges." [26]

This applies to both individuals and organizations as a whole. Thus, digital maturity can be defined as the degree to which an organization is ready to use digital technologies to achieve its business goals and gain competitive advantage. This means the ability to effectively adapt to technological changes, use digital tools to optimize processes, improve operations, and provide a better customer experience.

Denchyk I. notes that in the scientific literature, the term “digital maturity” is used to assess the readiness of an organization to work in the digital economy. [27] The author believes that the state of digital maturity is most accurately determined by the effectiveness of the implementation of digital processes in the organization and the coherence of the team's use of IT solutions to achieve business goals.

And one of the key determinants of digital transformation is digital management, which involves a set of actions related to the planning and implementation of measures aimed at digital transformation in a company.

Bygstad B., Iden J. define digital management as “the competent management of digital resources for business purposes, which involves continuous planning, organization, leadership, and follow-up.” [28] The authors emphasize that in the process of digital management it is necessary to be quite demanding both in terms of understanding technologies, the ability to integrate business and technological dynamics, and the speed with which this happens.

It is digital management that determines the steps to organically integrate digital technological solutions into the company's business processes and facilitates their implementation.

**Conclusions.** Thus, the paper proves the importance of digital transformation for financial services market participants, both banks and non-bank companies, in particular those operating in the fintech segment. The need for digital transformation is due to the active implementation of

digital technologies, which creates additional opportunities for financial sector companies to improve their performance and strengthen their competitive advantages in the market.

The study identifies key markers of fintech companies' development in Ukraine according to certain parameters: human resources, Internet and innovation penetration, digital quality of life, contribution of IT services to GDP, dynamics of the number of market participants, their financial condition and performance, localization and access to global markets.

The deterministic approach allowed us to identify the determinants of digital transformation, which include digital context, digital adoption, digital vision, digital competence, digital management, and digital maturity. By focusing on these determinants, a company operating in the financial services market can identify its strengths and weaknesses in relation to the introduction of digital technologies in its activities and make management decisions appropriate to the situation.

**References**

1. Fintech Trends 2025. Ukrainian Association of Fintech and Innovation Companies: official website. Retrieved from: https://drive.google.com/file/d/18SwyyJd6RsTTl_aCXcYFGbFTgpc01_Ly/view [in Ukrainian]
2. Berdar, M., Butenko, N., Hatska, L., Sagaydack, J. & Semenova, D. (2022) The Impact of Digitalization on the Model of Entrepreneurship Innovative Development. *Review of Economics and Finance*, vol. 20, pp. 1141-1149. Retrieved from: https://refpress.org/ref-vol20-a128/
3. Zaika, O. (2025) Digital transformation as a driver of financial sector development. *International Science Journal of Management, Economics & Finance*, vol.4 (1), pp. 23–30. DOI: https://doi.org/10.46299/j.isjmef.20250401.03
4. Sunduk, T. F., Babenko-Levada, V. G., Skorba, O. A. & Chornovol, A. O. (2023) Regarding the development of digital technologies in the financial sector (Ukrainian case). *Academic visions*, vol. 17. Retrieved from: https://academy-vision.org/index.php/av/article/view/253 [in Ukrainian]
5. Danylyshyn, V. & Synytsia, S. (2023) Digitalization in the financial services market: essence and significance for the economy of Ukraine in today's conditionsння. *Transformational economy*, vol. 3 (03), pp.16-20. DOI: https://doi.org/10.32782/2786-8141/2023-3-3 [in Ukrainian]
6. Kovalova, O. & Kucherevsky, A. (2024) Issues of transparency and digitalization of financial sector entities under martial law. *Digital economy and economic security*, *pp*.97-103. Retrieved from: https://www.researchgate.net/publication/382193262_ISSUES_OF_TRANSPARENCY_AND_DIGITALIZATION_OF_FINANCIAL_SECTOR_ENTITIES_UNDER_MARTIAL_LAW
7. Ponomarenko, I.V. & Rudiuk, L. V. (2020) Digitalization of the financial sector. *Marketing in Ukraine*, vol.3 (119), pp.48-52. [in Ukrainian]
8. Malyshko, Ye. (2022) Digitalization in the financial market: advantages and disadvantages. *Economy and society*. 2022. №39. DOI: https://doi.org/10.32782/2524-0072/2022-39-34 [in Ukrainian]
9. Kholiavko, N., Tarasenko, A. & Kolotok, M. (2022) Trends in digitalization of the world financial services market. *Scientific bulletin of Polissia*. 2022. №1(24). С.124–142. DOI: https://doi.org/10.25140/2410-9576-2022-1(24)-124-142 [in Ukrainian]
10. Nwoke, J. (2024) Digital Transformation in Financial Services and FinTech: Trends, Innovations and Emerging Technologies. *International Journal of Finance*, vol. 9 (6), pp. 1-24. Retrieved from: https://www.researchgate.net/publication/383867991_Digital_Transformation_in_Financial_Services_and_FinTech_Trends_Innovations_and_Emerging_Technologies
11. Jabeen, M., Jabeen, B. & Kausar, S. (2025) Unlocking the Impact of Digital Finance on the Digital Landscape of Businesses in Pakistan. *1st International conference on "Sustainability innovation and climate change: Transforming the business landscape"*, February 2025, pp.86-97. Retrieved from: https://www.researchgate.net/publication/389274926_Unlocking_the_Impact_of_Digital_Finance_on_the_Digital_Landscape_of_Businesses_in_Pakistan
12. Yelisieieva, O. K. & Peretiatko, A. I. (2022) Digitalization of banking sector and development of fintech market in Ukraine. *Bulletin of DonNUET "Economic Sciences"*, *vol.*2(77), pp.126-136. DOI: https://doi.org/10.33274/2079-4819-2022-77-2-126-136 [in Ukrainian]
13. Kandpal, V., Ozili, P. K., Jeyanthi, P. M., Ranjan, D.& Chandra, D. (2025) Digital Finance: An Overview. *Digital Finance and Metaverse in Banking*, pp.1-32. Retrieved from: https://www.researchgate.net/publication/389038211_Digital_Finance_An_Overview
14. Feyen, E., Frost, J., Gambacorta, L., Natarajan, H. & Saal, M. (2021) Fintech and the digital transformation of financial services: implications for market structure and public policy. *BIS Papers*, No. 117. Retrieved from: https://www.bis.org/publ/bppdf/bispap117.pdf
15. Carstens, A., Claessens, S., Restoy, F. & Shin, H.S. (2021) Regulating big techs in finance. *BIS Bulletin*, No. 45. Retrieved from: https://www.bis.org/publ/bisbull45.pdf
16. Soroka, B. (2022) Digitalization of the financial market of Ukraine: key risks for individual investors. *Economy and society*, vol.43. DOI: https://doi.org/10.32782/2524-0072/2022-43-76 [in Ukrainian]
17. Bontadini, F., Filippucci, F., Jona-Lasinio, C., Nicoletti, G. & Saia, A. (2024) Digitalisation of financial services, access to finance and aggregate economic performance. *OECD Economics Department Working Papers*, No.1818. Retrieved from: https://www.oecd.org/en/publications/digitalisation-of-financial-services-access-to-finance-and-aggregate-economic-performance_10c7e583-en.html

18. Ha, L.T. (2022) Effects of digitalization on financialization: Empirical evidence from European countries. *Technology in Society*., vol.68. Retrieved from: https://www.sciencedirect.com/science/article/abs/pii/S0160791X21003262
19. Tkachuk, N. (2022) Digitalization of the financial and economic sphere in Ukraine: status and development prospects. *Economic journal of Lesya Ukrainka Volyn National University*, vol.3 (31), pp.18–28. DOI: https://doi.org/10.29038/2786-4618-2022-03-18-28 [in Ukrainian]
20. Bondarchuk, O. (2025) The role of digital adoption in the digital transformation process of an enterprise. *Economy and society*, vol.73. DOI: https://doi.org/10.32782/2524-0072/2025-73-130 [in Ukrainian]
21. Shreeti, V. (2024) Tracing the adoption of digital technologies. *BIS Working Papers*, No 1166. Retrieved from: https://www.bis.org/publ/work1166.htm
22. Skare, M. & Soriano, D.R. (2021) How globalization is changing digital technology adoption: An international perspective. *Journal of Innovation & Knowledge*, vol.6, issue 4, pp.222-233. Retrieved from: https://www.sciencedirect.com/science/article/pii/S2444569X21000202
23. Adiguzel, Z., Aslan, B. & Sonmez Cakir, F. (2023) Examination of the Strategic Vision of Banks in Digitalization and the Effects of Innovation on Performance and Artificial Intelligence Perception. *Universidad & Empresa Journal*, vol. 25(44), pp.1-29. DOI: https://doi.org/10.12804/revistas.urosario.edu.co/empresa/a.12023
24. Shestack, Y., Biliavska, Y., Osetskyi, V., Mykytenko, N. & Umantsiv, Y. (2023) Devising a comprehensive method to manage digital competencies. *Eastern-European journal of enterprise technologies*, No. 3(13), pp. 86-97.
25. Erceg, V. & Zoranovic, T. (2020) Required competencies for successful digital transformation. *Ekonomika*, vol. 66, No 3, pp.47-54. DOI: https://doi.org/10.5937/ekonomika2003047E
26. Danieliene, R. & Tolmach, M. (2019) The Citizens' Digital Competencies and Their Role in the Modern Life. *Digital platform: information technologies in the socio-cultural sphere*, vol. 2(1), pp.55–59.
27. Denchyk, I. (2024) Development of methods for assessing the digital maturity of business. *Financial and credit systems: prospects for development*, vol. 3, No. 14, pp. 59-67. DOI: https://doi.org/10.26565/2786-4995-2024-3-05
28. Bygstad, B. & Iden, J. (2024) Digital management in the public sector - a framework. *Electronic Government an International Journal*, vol.20(1):1. DOI: https://doi.org/10.1504/EG.2024.10054251
29. Digital Innovation Strategy to 2030. Full version of the presentation. *WINWIN2030. Innovation Strategy that Wins the World: official website*. Retrieved from: https://winwin.gov.ua/assets/files/WINWIN_Основна%20презентація.pdf [in Ukrainian]
30. Strategy for the Development of the Financial Sector of Ukraine. *National Bank of Ukraine: official website*. Retrieved from: https://bank.gov.ua/admin_uploads/article/Strategy_finsector_NBU.pdf?v=13 [in Ukrainian]
31. Strategy for the development of fintech in Ukraine until 2025 – a course for sustainable development of innovations, cashless and financial literacy. *National Bank of Ukraine: official website*. Retrieved from: https://bank.gov.ua/ua/news/all/strategiya-rozvitku-fintehu-v-ukrayini-do-2025-roku--kurs-na-staliy-rozvitok-innovatsiy-keshles-ta-finansovu-gramotnist [in Ukrainian]
32. English-Ukrainian Financial Technology Glossary. *Ukrainian Association of Fintech and Innovation Companies: official website*. Retrieved from: https://drive.google.com/file/d/1-Qy0ibwyI31GX_CnMEwOWEt2bFEEn-U4/view
33. Ukrainian catalog of fintech companies 2024. *Ukrainian Association of Fintech and Innovation Companies: official website*. Retrieved from: https://fintechua.org/catalog_2024ua [in Ukrainian]
34. Catalog of fintech companies of Ukraine 2023. *Ukrainian Association of Fintech and Innovation Companies: official website*. Retrieved from: https://fintechua.org/download [in Ukrainian]
35. How Ukrainian fintech developed in 2021: research of UAFIC. Retrieved from: https://fintechinsider.com.ua/yak-ukrayinskyj-finteh-rozvyvavsya-v-2021-roczi-doslidzhennya-uafic/ [in Ukrainian]
36. Statistics. *National Bank of Ukraine: official website*. Retrieved from: https://bank.gov.ua/ua/statistic [in Ukrainian]
37. Digital Vision. Retrieved from: https://www.fanruan.com/en/glossary/digital-transformation/digital-vision

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## Умови та детермінанти цифрової трансформації учасників ринку фінансових послуг

***Анотація.*** Фінансова система країни вважається справжнім серцем національної економіки, забезпечуючи ефективне управління грошовими потоками та фінансово-економічну стабільність, сприяючи залученню інвестицій та створюючи умови для її подальшого розвитку.

**Постановка проблеми.** Фінансовий сектор характеризується постійними перетвореннями, які обумовлені в тому числі поступовим переходом країни до цифрової економіки. Це формує в учасників ринку фінансових послуг потребу трансформувати свої бізнес-процеси на основі активного впровадження та поглибленого використання цифрових технологій.

**Нерозв'язані аспекти.** Теоретичним підґрунтям дослідження стали роботи сучасних іноземних та вітчизняних дослідників, присвячені вивченню впливу процесів цифровізації на функціонування економіки та її фінансовий сектор, окремих аспектів цифрової трансформації на різних рівнях соціально-економічних систем.

**Мета статті.** Метою дослідження стало виявлення ключових маркерів розвитку фінтех компаній в Україні та побудова детермінантної концептуальної моделі цифрової трансформації учасників ринку фінансових послуг.

**Основний матеріал.** Об'єктом дослідження став фінансовий сектор економіки України та учасники ринку фінансових послуг, зокрема, фінтех компанії. В статті досліджено окремі показники функціонування учасників ринку фінансових банківських та небанківських послуг в Україні в контексті стратегічного курсу країни на цифровізацію. Виявлено детермінанти та побудована детермінантна концептуальна модель цифрової трансформації учасників ринку фінансових послуг.

В ході дослідження використано методи статистичного та динамічного аналізу, методи логічного узагальнення та застосовано детермінантний підхід до побудови концептуальної моделі цифрової трансформації учасників ринку фінансових послуг.

**Висновки.** На основі відкритих матеріалів аналітики виявлено ключові маркери розвитку фінтех компаній в Україні за параметрами, що характеризують їхній кадровий потенціал, поширення Інтернету та інновацій, рівень цифрової якості життя, внесок ІТ-послуг у формування ВВП, динаміку кількості учасників ринку, їх фінансовий стан та результати діяльності, локалізацію та вихід на світову арену. Визначено детермінанти цифрової трансформації, а саме: цифровий контекст, цифрове прийняття, цифрове бачення, цифрова компетентність, цифровий менеджмент та цифрова зрілість. Проведене дослідження створює фундамент для прийняття та реалізації управлінських рішень на рівні окремих учасників ринку фінансових послуг щодо цифрової трансформації діяльності.

***Ключові слова:*** *цифрова економіка, цифровізація, цифрова трансформація, фінансовий сектор, ринок фінансових послуг, фінтех компанії, детермінантний підхід*

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**Список літератури**

1. Фінтех тренди 2025. *Українська асоціація фінтех та інноваційних компаній : офіційний сайт.* URL: https://drive.google.com/file/d/18SwyyJd6RsTTl_aCXcYFGbFTgpc01_Ly/view
2. Berdar M., Butenko N., Hatska L., Sagaydack J., Semenova D. The Impact of Digitalization on the Model of Entrepreneurship Innovative Development. *Review of Economics and Finance*. 2022. Vol. 20. Pp. 1141-1149. URL: https://refpress.org/ref-vol20-a128/
3. Zaika O. Digital transformation as a driver of financial sector development. *International Science Journal of Management, Economics & Finance*. 2025. Vol.4(1). Pp. 23-30. DOI: https://doi.org/10.46299/j.isjmef.20250401.03
4. Сундук Т. Ф., Бабенко-Левада В. Г., Скорба О. А., Чорновол, А. О. Щодо розвитку цифрових технологій в фінансовому секторі (український кейс). *Академічні візії*. 2023. Вип.17. URL: https://academy-vision.org/index.php/av/article/view/253
5. Данилишин В., Синиця С. Діджиталізація на ринку фінансових послуг: сутність та значення для економіки україни в умовах сьогодення. *Трансформаційна економіка*. 2023. № 3 (03). С.16-20. DOI: https://doi.org/10.32782/2786-8141/2023-3-3
6. Kovalova O., Kucherevsky A. Issues of transparency and digitalization of financial sector entities under martial law. *Цифрова економіка та економічна безпека*. 2024. С.97-103. URL: https://www.researchgate.net/publication/382193262_ISSUES_OF_TRANSPARENCY_AND_DIGITALIZATION_OF_FINANCIAL_SECTOR_ENTITIES_UNDER_MARTIAL_LAW
7. Пономаренко І. В., Рудюк Л. В. Діджиталізація фінансового сектору. *Маркетинг в Україні*. 2020. № 3 (119). С. 48-52.
8. Малишко Є.О. Діджиталізація на фінансовому ринку: переваги та недоліки. *Економіка та суспільство*. 2022. №39. DOI: https://doi.org/10.32782/2524-0072/2022-39-34
9. Холявко Н., Тарасенко А., Колоток М. Тенденції диджиталізації світового ринку фінансових послуг. *Науковий вісник Полісся*. 2022. №1(24). С.124-142. URL: https://doi.org/10.25140/2410-9576-2022-1(24)-124-142
10. Nwoke J. Digital Transformation in Financial Services and FinTech: Trends, Innovations and Emerging Technologies. *International Journal of Finance*. 2024. Vol. 9(6). Pp. 1-24. URL: https://www.researchgate.net/publication/383867991_Digital_Transformation_in_Financial_Services_and_FinTech_Trends_Innovations_and_Emerging_Technologies
11. Jabeen M., Jabeen B., Kausar S. Unlocking the Impact of Digital Finance on the Digital Landscape of Businesses in Pakistan. *1st International conference on "Sustainability innovation and climate change: Transforming the business landscape"*. February 2025. Pp. 86-97. URL: https://www.researchgate.net/publication/389274926_Unlocking_the_Impact_of_Digital_Finance_on_the_Digital_Landscape_of_Businesses_in_Pakistan
12. Єлісєєва О. К., Перетятько А. І. Діджиталізація банківського сектору та розвиток фінтех ринку в Україні. *Вісник ДонНУЕТ «Економічні науки»*. 2022. Вип. 2(77). С.126-136. DOI: https://doi.org/10.33274/2079-4819-2022-77-2-126-136
13. Kandpal V., Ozili P. K., Jeyanthi P. M., Ranjan D., Chandra D. Digital Finance: An Overview. *Digital Finance and Metaverse in Banking*, 2025. Pp. 1-32. URL: https://www.researchgate.net/publication/389038211_Digital_Finance_An_Overview
14. Feyen E., Frost J., Gambacorta L., Natarajan H., Saal M. Fintech and the digital transformation of financial services: implications for market structure and public policy. *BIS Papers*. 2021. No. 117. URL: https://www.bis.org/publ/bppdf/bispap117.pdf
15. Carstens A., Claessens S., Restoy F., Shin H.S. Regulating big techs in finance. *BIS Bulletin*. 2021. No. 45. URL: https://www.bis.org/publ/bisbull45.pdf

16. Сорока Б. Діджиталізація фінансового ринку України: ключові ризики для індивідуальних інвесторів. *Економіка та суспільство*. 2022. № 43. DOI: https://doi.org/10.32782/2524-0072/2022-43-76
17. Bontadini F., Filippucci F., Jona-Lasinio C., Nicoletti G., Saia A.Digitalisation of financial services, access to finance and aggregate economic performance. *OECD Economics Department Working Papers*. 2024. No.1818. URL: https://www.oecd.org/en/publications/digitalisation-of-financial-services-access-to-finance-and-aggregate-economic-performance_10c7e583-en.html
18. Ha L.T. Effects of digitalization on financialization: Empirical evidence from European countries. *Technology in Society*. 2022. Vol.68. URL: https://www.sciencedirect.com/science/article/abs/pii/S0160791X21003262
19. Ткачук Н. Діджиталізація фінансово-економічної сфери в Україні: стан та перспективи розвитку. *Економічний часопис Волинського національного університету імені Лесі Українки*. 2022. № 3 (31). С.18–28. DOI: https://doi.org/10.29038/2786-4618-2022-03-18-28
20. Бондарчук О. Роль цифрового прийняття в процесі цифрової трансформації підприємства. *Економіка та суспільство*. 2025. №73. DOI: https://doi.org/10.32782/2524-0072/2025-73-130.
21. ShreetiV. Tracing the adoption of digital technologies. *BIS Working Papers*. 2024. No 1166. URL: https://www.bis.org/publ/work1166.htm
22. Skare M., Soriano D.R. How globalization is changing digital technology adoption: An international perspective. *Journal of Innovation & Knowledge*. 2021. Vol.6. Issue 4. Pp.222-233. URL: https://www.sciencedirect.com/science/article/pii/S2444569X21000202
23. Adiguzel Z., Aslan B., Sonmez Cakir F. Examination of the Strategic Vision of Banks in Digitalization and the Effects of Innovation on Performance and Artificial Intelligence Perception. *Universidad & Empresa Journal*. 2023. Vol. 25(44). Pp.1-29. DOI: https://doi.org/10.12804/revistas.urosario.edu.co/empresa/a.12023
24. Shestack Y., Biliavska Y., Osetskyi V., Mykytenko N., Umantsiv Y. Devising a comprehensive method to manage digital competencies. *Eastern-European journal of enterprise technologies*. 2023. № 3(13). С. 86-97.
25. Erceg V., Zoranovic T. Required competencies for successful digital transformation. *Ekonomika*. 2020. Vol. 66. No 3. Pp.47-54. DOI: https://doi.org/10.5937/ekonomika2003047E
26. Danieliene R., Tolmach M. The Citizens' Digital Competencies and Their Role in the Modern Life. *Цифрова платформа: інформаційні технології в соціокультурній сфері*. 2019. № 2(1). С.55–59.
27. Denchyk I. Development of methods for assessing the digital maturity of business. *Financial and credit systems: prospects for development*. 2024. Vol. 3. No. 14. Pp. 59-67. DOI: https://doi.org/10.26565/2786-4995-2024-3-05
28. Bygstad B., Iden J. Digital management in the public sector - a framework. *Electronic Government an International Journal*. 2024. Vol.20(1):1. DOI: https://doi.org/10.1504/EG.2024.10054251
29. Стратегія цифрового розвитку інновацій до 2030 року. Повна версія презентації. *WINWIN2030. Стратегія інновацій, що виграє мир* : офіційний сайт. https://winwin.gov.ua/assets/files/WINWIN_Основна%20презентація.pdf
30. Стратегія розвитку фінансового сектору України. *Національний банк України: офіційний сайт*. URL: https://bank.gov.ua/admin_uploads/article/Strategy_finsector_NBU.pdf?v=13
31. Стратегія розвитку фінтеху в Україні до 2025 року – курс на сталий розвиток інновацій, кешлес та фінансову грамотність. *Національний банк України: офіційний сайт.* URL: https://bank.gov.ua/ua/news/all/strategiya-rozvitku-fintehu-v-ukrayini-do-2025-roku--kurs-na-staliy-rozvitok-innovatsiy-keshles-ta-finansovu-gramotnist
32. Англо-український фінансово-технологічний тлумачний словник. *Українська асоціація фінтех та інноваційних компаній : офіційний сайт*. URL: https://drive.google.com/file/d/1-Qy0ibwyI31GX_CnMEwOWEt2bFEEn-U4/view
33. Український каталог фінтех компаній 2024. *Українська асоціація фінтех та інноваційних компаній : офіційний сайт*. URL: https://fintechua.org/catalog_2024ua
34. Каталог фінтех компаній України 2023. *Українська асоціація фінтех та інноваційних компаній : офіційний сайт*. URL: https://fintechua.org/download
35. Як український фінтех розвивався в 2021 році: дослідження UAFIC. URL: https://fintechinsider.com.ua/yak-ukrayinskyj-finteh-rozvyvavsya-v-2021-roczi-doslidzhennya-uafic/
36. Статистика. *Національний банк України: офіційний сайт*. URL: https://bank.gov.ua/ua/statistic
37. Digital Vision. URL: https://www.fanruan.com/en/glossary/digital-transformation/digital-vision

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# Strategic asset management in the system of enterprise finance

***Abstract.*** Strategic asset management is gaining particular importance for ensuring the financial stability and long-term development of enterprises in the context of increasing complexity of the business environment, limited resources, and rapid technological change. A strategic approach to asset management enables organizations to build sustainable competitive advantages by aligning investment decisions, the technical condition of assets, and the organization's strategic objectives.

**Problem statement.** The lack of a systematic approach to asset management reduces resource efficiency and limits organizational adaptability to external challenges. Current research often presents asset management in a fragmented manner, with insufficient integration into broader corporate strategy.

**Unresolved issues.** Key areas requiring deeper investigation include limited use of digital technologies in asset management, weak interdepartmental communication, financial resource shortages, and the absence of environmental considerations in strategic planning.

**Purpose of the research.** The purpose of the research is to substantiate the conceptual foundations of strategic asset management as a basis for enhancing financial efficiency and generating long-term competitive advantages.

**Research results.** The research identifies the key components of the asset management process, substantiates the theoretical foundations of the strategic approach, and outlines the main challenges and promising directions for its development. Particular emphasis is placed on the role of modern digital tools in building asset management systems, data analytics, and monitoring and controlling the asset life cycle. The main challenges identified include inefficient resource utilization, funding shortages, limited strategic planning, low innovation capacity, and regulatory complexity. The study highlights the importance of data integration in strategic planning and the development of effective interdepartmental communication, especially in light of the complexities of digital monitoring and the need to implement sustainable development practices.

**Conclusions**. Conclusions emphasize the importance of developing long-term asset management strategies that are adaptable to changes in the external environment. Modern strategic asset planning tools should ensure financial resilience, organizational flexibility, and support sustainable development. The research defines the key components of a strategic asset management system, substantiates the interests of various stakeholder groups in the planning and implementation of a strategic asset management plan, and proposes promising directions for further development.

***Keywords:*** *assets, management, instruments, corporate finance, technology, efficiency*
Formulas: –; fig.: 2, tabl.: 3, bibl.: 16.
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**Introduction.** In today's economic conditions, strategic asset management plays an important role in ensuring the financial stability of enterprises. Assets, which are the basis of the financial and economic activity of business entities, determine the level of investment attractiveness and are a key factor of competitiveness.

An important stage in the development of strategic asset management was the introduction of international standards and requirements, in particular the ISO 55000 series (according to which asset management should be based on the integration of technical, financial, and managerial approaches to achieve the maximum long-term effect from their use); the ISO 55001 series, which defines requirements for an asset management system; and the ISO 55002 series, which details practical recommendations for implementing asset management standards, taking into account the need to align enterprise strategic objectives with long-term resource planning [11]. In Ukraine, the harmonization of standards in the field of asset management with international requirements is implemented through DSTU ISO/TS 55010:2019 [8]. This standard promotes the alignment of financial and non-financial functions in the asset management system. The use of unified regulatory standards allows enterprises to form a holistic approach to management, taking into account stakeholder interests, the asset life cycle, financial risks, and external challenges.

The integration of strategic asset management with the corporate strategy of the enterprise is a key condition for ensuring consistency between development goals and the use of resource potential. In the overall strategy, assets are viewed not as separate accounting items but as tools for implementing strategic decisions that contribute to achieving long-term competitive advantages. Developing a strategic asset management plan enhances managerial transparency, strengthens control over the rational use of assets, and enables timely responses to internal and external changes.

Effective asset management influences the performance of financial management, especially in conditions of rapid technological progress. The use of modern analytical tools to optimize asset structure, improve utilization mechanisms, and forecast financial indicators allows enterprises to minimize risks and increase productivity. The use of modern digital tools enables comprehensive improvement of asset management systems. The application of information-analytical platforms, asset lifecycle management systems, IoT technologies, analytical models, and cloud services provides effective instruments for cost optimization, monitoring asset condition, and forecasting their use.

Strategic asset management covers several important areas of financial management, in particular: formation of financial policy, investment planning, asset valuation, and control over their use. An effective strategy should ensure enterprise flexibility, efficient resource use, and account for external factors such as regulatory changes, market fluctuations, and global challenges. Compared to a reactive approach, the key advantages of strategic asset management include improved decision-making, better resource utilization, cost reduction, and minimization of operational risks (Table 1).

*Table 1. Basic Advantages of Enterprise Asset Management Considering the Strategic Component*

| **Criterion** | **Asset Management with Strategic Component** | **Asset Management without Strategic Component** |
|---|---|---|
| 1 | 2 | 3 |
| Approach | Long-term planning considering the asset life cycle. | Reaction to complications after problems or failures occur. |
| Goal | Maximization of efficiency, productivity, and asset longevity. | Restoration of asset functionality after damage without prior planning. |
| Costs | Higher initial costs, compensated by lower total expenses throughout the asset life cycle. | Low initial costs, which over time lead to higher repair and maintenance expenses. |

*Table 1. (continued)*

| 1 | 2 | 3 |
|---|---|---|
| Risk Management | Systematic identification of risks related to asset operation and their minimization. | Increased operational risks and safety threats due to unplanned interruptions in functioning. |
| Decision-Making | Use of analytical tools, asset condition data, and forecasting. | Impulsive, situational decision-making without strategic justification. |
| Investment Planning | Priorities are determined based on lifecycle cost analysis and efficiency data. | Hasty and costly decisions due to lack of tools for analytics, monitoring, and forecasting. |
| Operational Efficiency | Reduced downtime, increased reliability and stability of operations. | Frequent downtime, high repair costs, and emergency maintenance leading to productivity losses. |

*Source: compiled by the author*

Research on the conceptual foundations of enterprise asset management will create prerequisites for the development of strategic management decisions that respond to modern challenges, contribute to the achievement of the financial and operational goals of the enterprise, and form an effective model of resource management.

**Literature Review.** In the scientific works of domestic and foreign scholars, considerable attention has been paid to the issue of asset management in the system of enterprise finance. The conceptual foundations of asset formation and management are defined in the collective monograph edited by I. O. Blank, where enterprise assets are considered as a set of property values used in operational activities to generate profit and achieve financial goals [3, p. 20]. Enterprise assets can also be viewed as a separate type of resource used to achieve the strategic goals of the enterprise in the future and to ensure its financial stability [15].

Among modern studies, it is worth noting those in which the asset management process is examined as an important tool for achieving the strategic goals of the organization. A high-quality and efficient asset management process allows enterprises to optimize asset structure, improve financial performance, and minimize risks. As O. Babiy and V. Koynak [1] emphasize, to ensure effective use of enterprise assets, modern approaches to strategic management must be applied, taking into account the types, components, dynamics, and roles of assets within the overall resource structure. Systemic asset management enables enterprises to identify opportunities to improve efficiency and optimize overall productivity.

In this context, Hvozdei N. highlights that managerial decisions regarding the structure and use of assets determine the subsequent financial stability, competitiveness, and solvency of the enterprise [9]. Furthermore, Burdonos L. and Vynohradnia V. note that one of the key factors ensuring financial stability and the active development of the enterprise is strategic planning and effective use of its resource potential, particularly current and non-current assets [6, p. 37]. Under modern economic conditions, as Budko O., Kuksa A., and Chehuta M. observe, the asset management system is regarded as a tool of strategic enterprise development aimed at increasing market value, preserving material and intangible resources, and strengthening stakeholder trust [5, p. 75].

According to scholars, effective enterprise asset management requires a comprehensive assessment that not only determines the performance of managerial actions but also promptly corrects problematic aspects of financial policy. As Pihul N., Bondarenko Ye., and Kyrychenko A. argue, such an approach ensures enterprise adaptability to changes in the external environment and contributes to increased overall management efficiency [13, p. 339]. Heienko M. and Omelyanenko D. note that the asset management system must be adapted under conditions of risk and uncertainty; in particular, it is crucial to develop an effective financial policy that ensures sustainable development through the rational use of assets [10, p. 23]. Meanwhile, Zayachkivska O. and Semeshchuk S. [16] stress the need for a comprehensive approach to asset management, which not only optimizes asset structure but also contributes to ecological, social, and economic balance in

enterprise activities. Special attention should be paid to developing an individualized asset management strategy, based on the principles of sustainable development and considering the specifics of the enterprise, its ecosystem, and stakeholder expectations.

Among foreign researchers, strategic asset management has been studied as a distinct level of enterprise management: along with tactical and operational levels, it is an essential component of financial management and determines the economic efficiency of the enterprise [7]. Asset management should aim at value optimization, with all managerial decisions accounting for their impact on this indicator throughout the asset lifecycle [2]. Asset management should be explored as a comprehensive system combining a strategic approach, technological solutions, and risk management mechanisms to ensure long-term financial efficiency [12]. Modern business conditions shape a new type of asset management strategy an integrated one, characterized by flexibility and dynamism in making critical fin– ancial decisions [4].

At the same time, further research into strategic asset management remains both relevant and necessary to optimize resource management, improve asset efficiency, and ensure enterprise financial stability.

**Purpose, objectives, and research methods.** The purpose of the article is to substantiate the conceptual foundations of enterprise strategic asset management, which serve as the basis for enhancing financial efficiency and forming additional competitive advantages. To achieve this purpose, the article defines the components of the enterprise asset management process, substantiates the theoretical foundations and elements of strategic asset management, and identifies the main problems and promising directions for enterprise strategic asset management. The methodological and theoretical basis of the study consists of the works of domestic and foreign scholars and analytical information regarding modern trends in enterprise strategic asset management. Methods of empirical analysis, synthesis, and structural-functional analysis were applied.

**Research Results.** Effective asset management begins with a clear understanding of what belongs to this category in economic terms. Based on a generalization of research in the field of enterprise finance, assets include:

- Ownership – official property of the business entity reflected in the balance sheet;
- Property – any property and monetary assets owned by the enterprise; Things – any tangible item with material form and value at the disposal of the enterprise;
- Resources – material and monetary resources used or to be used by the enterprise in business and commercial activities;
- Means – financial resources in the form of cash available for enterprise economic activity.

This list can be expanded and refined depending on various classification features of assets, but it is important to stress that enterprise performance depends not only on the volume of assets it owns but primarily on its ability to manage them effectively to ensure maximum financial results.

In general, the asset management process involves the following elements:

- justification of goals, managerial decisions, and measures related to enterprise assets, along with systematic monitoring of their implementation during a defined period;
- development of methodological approaches to evaluating the efficiency of asset use, aimed at improving managerial performance;
- development of an asset management strategy that analyzes existing mechanisms, evaluates their effectiveness, and determines their applicability under different operating conditions;
- application of modern analytical methods and models in decision-making, with an emphasis on asset management;
- development of a concept for managing highly liquid assets to ensure enterprise flexibility;

- creation of a comprehensive strategic vision of asset management, including long-term development plans and adaptation mechanisms for economic challenges;
- use of internal regulatory tools for management processes aimed at asset optimization.

Thus, asset management is a key process in the financial and economic activity of any enterprise, ensuring sustainable economic development and the achievement of defined goals. Rational formation and use of assets maximize profit and guarantee financial stability. In addition, enterprises strive to increase asset value to strengthen investment attractiveness. Therefore, applying a strategic approach to enterprise asset management is a crucial and timely task, especially under conditions of economic instability and external threats. To implement strategic management, it is necessary to assess the role of assets in achieving enterprise goals on the basis of the strategic plan; it is also essential to determine and justify how enterprise resources can contribute to the realization of its strategic priorities (Table 2).

It is important to emphasize the specifics of forming strategic decisions on managing current and non-current assets. Strategic asset management involves balancing long-term investments in non-current assets with efficient use of current assets. Renewal of fixed assets drives productivity growth, while management of current assets ensures liquidity and operational efficiency [14].

*Table 2 . Theoretical Foundations of Strategic Enterprise Asset Management*

| Strategic Objective | Tasks | Expected Results | Indicators |
|---|---|---|---|
| Non-current assets | | | |
| Ensuring efficient use of non-current assets | Optimization of the structure of non-current assets; planning renewal of fixed assets; increasing the level of technological modernization of the enterprise. | Growth of productivity and profitability; ensuring financial stability; growth of profitability, competitiveness of the enterprise. | Fixed asset renewal ratio; movement indicators of non-current assets; profitability; depreciation. |
| Current assets | | | |
| Ensuring continuity of the production process, liquidity, and risk minimization | Optimization of the structure of current assets; ensuring efficient inventory management; increasing financial liquidity and asset profitability. | Minimization of financial risks and losses; increased turnover of assets; growth of financial results of the enterprise. | Structure of current assets; turnover ratio; liquidity ratios; profitability; duration of operating and financial cycles. |

*Source: compiled by the author*

At the core of Strategic Asset Management (SAM) lies the important task of optimizing the useful life of assets, ensuring maximum investment returns, and building resilience for such assets as infrastructure, facilities, and equipment.

The key objective of managerial decision-making is the optimal alignment of operating costs and investments in non-current assets with the strategic goals of the enterprise.

A distinctive feature of modern strategic asset management is that key decisions are made on the basis of complete asset data– regardless of their volume – through the use of new digital platforms for big data analysis, while taking into account the enterprise's resource potential.

In addition, a comprehensive asset management strategy must consider the impact of external factors and cover the entire decision-making process related to the asset life cycle (acquisition, operation, maintenance, disposal, etc.) (Figure 1).

Thus, enterprise asset lifecycle management forms the core of the entire strategic management system, as it is aimed at the efficient use of resources from acquisition to decommissioning and disposal of assets.

In addition, careful assessment of potential risks, identification of ways to minimize them, determination of key performance indicators of asset utilization, ensuring compliance with legislative or regulatory requirements for the use and maintenance of assets, as well as the use of

technologies and software for tracking asset information and ensuring access to critical data are essential for making strategic management decisions.

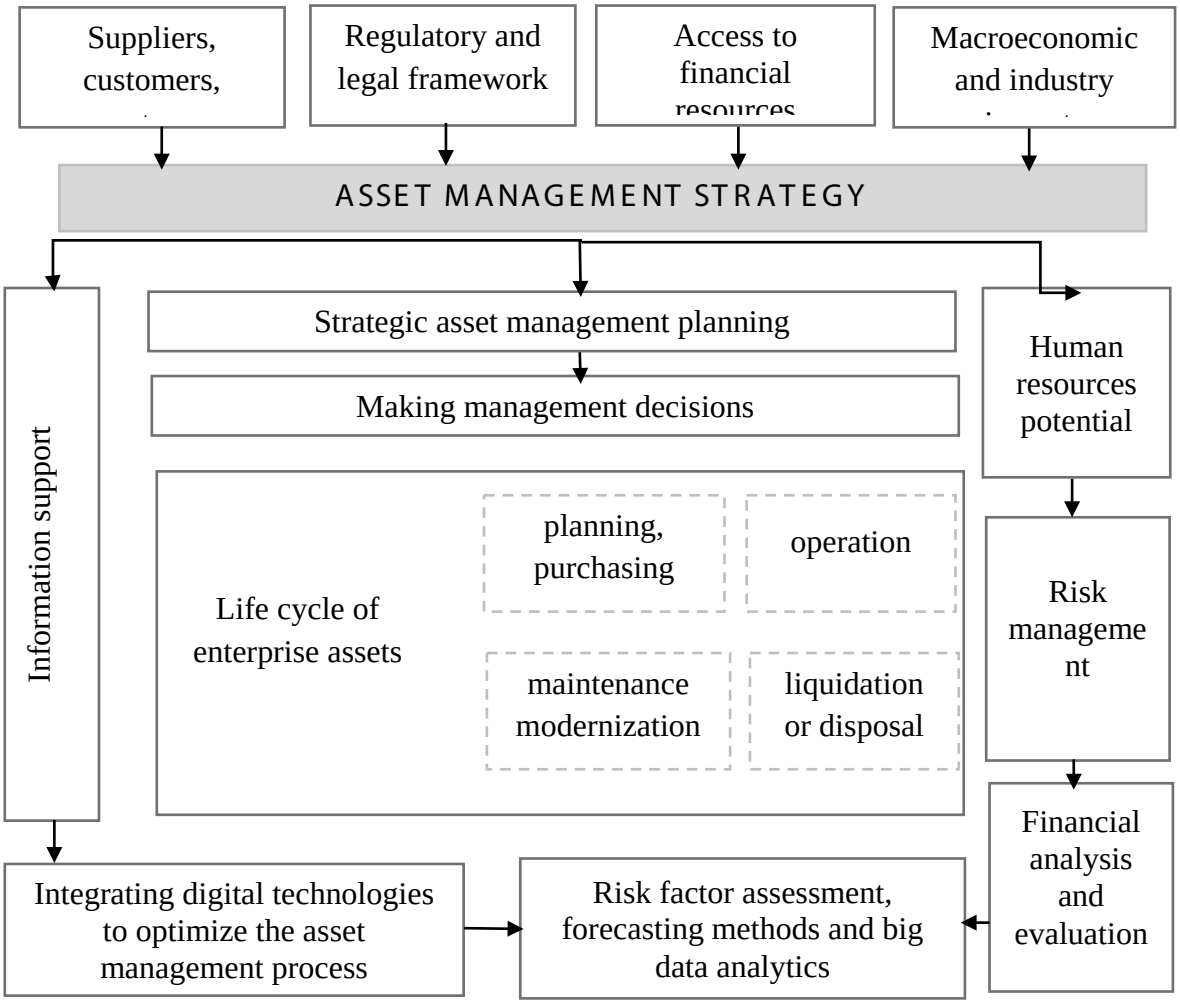


*Figure 1. Strategic Asset Management System*
*Source: compiled by the author*

When developing an asset management strategy, it is important to ensure its integration with the mission, vision, and strategic goals of the enterprise, and to consider the influence of assets on building competitive advantages. Therefore, an important planning tool is the Strategic Asset Management Plan (SAMP). Moreover, it serves as a means of aligning stakeholder interests and expectations with the organization's long-term priorities under resource constraints. Its development and implementation promote greater transparency of managerial decisions and foster effective communication among functional units, investors, clients, and regulatory institutions (Table 3).

Thanks to the clear definition of objectives, decision-making criteria, risk appetite, and expected results, SAMP ensures the integrity of strategic asset management, increases employee engagement, and strengthens trust in the enterprise's strategic development vector.

Modern approaches to strategic asset management are undergoing active transformation due to digital technologies. Digitalization is fundamentally changing the way enterprises approach strategic asset management, opening up new opportunities to improve efficiency, transparency, and adaptability of managerial decisions. Under current conditions, enterprises are increasingly implementing innovative digital tools that not only automate asset accounting and control but also enable intelligent asset management based on real-time data.

*Table 3. Interests of Different Stakeholder Groups in the Process of Planning and Implementing SAMP*

| Group | Interests and Expectations |
|---|---|
| Owners, Investors | Confirmation of investment effectiveness; risk management; transparent justification of actions; alignment with the mission and strategic objectives of the organization. |
| Top Management | Ensuring clarity of strategic goals and decision-making criteria; strengthening coordination of planning between functional areas; increasing the level of risk acceptance and prioritization criteria. |
| Department Heads, Middle Managers | Formation of a shared vision, coordination among departments; overcoming organizational fragmentation; alignment of functional roles with the achievement of strategic objectives. |
| Personnel | Engagement of staff through clear definition of goals, tasks, expected results, and logic of managerial decisions; consideration of practical experience, innovative ideas, and proposals; participation in strategic planning based on practical experience. |
| External Stakeholders (consumers, regulatory institutions) | Formation of confidence in the logic, justification, and transparency of determining strategic priorities; alignment of requirements and expectations; ensuring transparency and accountability of strategic planning; increasing the level of trust and reducing the risk of conflicts. |

*Source: compiled by the author*

The introduction of intelligent asset management systems – such as EAM (Enterprise Asset Management) and CMMS (Computerized Maintenance Management Systems) – as well as Internet of Things (IoT) technologies and big data analytics, allows enterprises to monitor the technical condition of assets in real time, forecast wear and tear, optimize maintenance schedules, and make informed managerial decisions. As a result, enterprises achieve lower operating costs, increased equipment reliability, and develop the necessary level of adaptability to changes in the external environment.

One of the key technologies for optimizing strategic asset management is the Internet of Things (IoT), which provides continuous monitoring of equipment condition through specialized sensors. These devices capture critical parameters such as temperature, vibrations, pressure, and loads, transmitting them to analytical systems. This enables enterprises to promptly detect deviations, predict potential equipment failures, and take timely preventive measures (Figure 2).

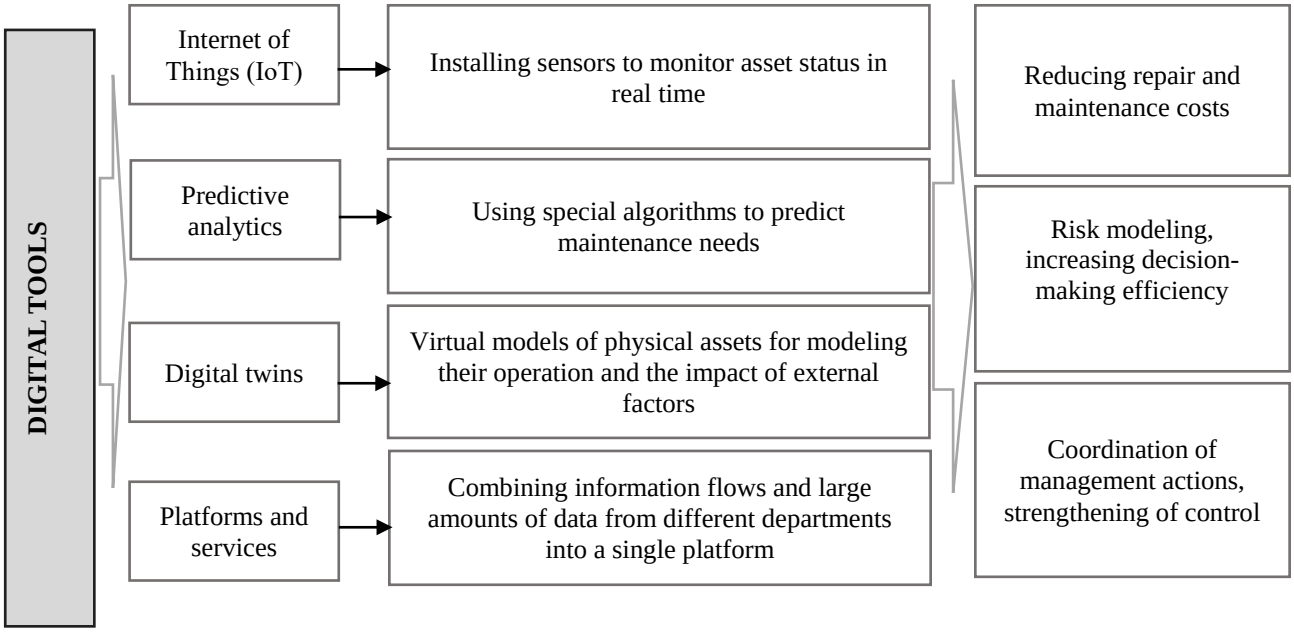


*Figure 2. Modern Digital Tools in Strategic Asset Planning*
*Source: compiled by the author*

Integration of financial analytics and machine learning makes it possible to capture the current condition of assets and model their future state. This enables the optimization of maintenance schedules, reduction of emergency shutdowns, and extension of equipment lifecycle. Special attention should be given to the use of digital twins – virtual models of physical assets that reflect their structure, functioning, and dynamics of change. They allow for simulations, risk assessments, and strategic decision-making based on scenario analysis.

Digital technologies also facilitate data integration across various departments of enterprises – from maintenance to finance and logistics. This enables the creation of a unified information environment for strategic decision-making, improves investment planning accuracy, strengthens risk management, and supports the achievement of organizational goals. This becomes not only the foundation for technological modernization of the asset management system but also a key factor in shaping enterprise competitive advantages in modern economic conditions.

**Discussion.** Strategic asset management is a complex process that involves difficulties and challenges affecting enterprise economic efficiency. Among the already identified problems, the following should be emphasized:

−low efficiency of asset use, caused by limited application of modern methods and asset analysis platforms, and insufficient monitoring of resource utilization;

−shortage of financial resources due to lack of funding, untimely servicing of obligations, and insufficient investment volume, which reduce profitability and increase financial risks;

−absence of strategic planning in asset utilization, which negatively affects the ability to respond to market changes and external challenges;

−insufficient level of innovation in asset management, which reduces enterprise competitiveness and limits its potential;

−regulatory and legal constraints, which complicate effective asset management due to significant changes in legislation or financial/property regulation, potentially slowing the implementation of strategic decisions.

In our view, this list should be supplemented with current challenges arising from the peculiarities of digital solutions at the enterprise and communication structures between departments or partners. Often, difficulties arise in data integration and utilization in asset management due to fragmentation or the absence of effective analytics. In particular, enterprises may have analytical tools to assess asset use, but after data processing, the information is not incorporated into strategy development at managerial levels. This problem often occurs due to insufficient communication between departments (or managers), where critical information may be lost or not recognized as important, which hinders the advantages of an integrated asset management system.

In addition, issues of environmental responsibility in asset management and the inclusion of sustainable development goals in enterprise strategic planning remain highly relevant. Insufficient integration of environmental standards, improper maintenance planning, and lack of monitoring of asset impact on the environment can result in inefficient resource use and hinder strategic initiatives, especially in the long run.

Another important issue for enterprises is the use of outsourcing as an additional strategy for efficient resource utilization, particularly under conditions of rapid technological development. The absence of outsourcing in asset management limits access to modern technologies, can overload and exhaust internal resources, and slows down decision-making in response to market changes. Moreover, underdeveloped data management infrastructure – due to lack of resources for relevant specialists or digital solutions – significantly delays asset analytics and negatively impacts the effectiveness of strategic asset management.

Enterprises striving to remain competitive under modern economic conditions must design asset management strategies that integrate modern technologies and account for the growing role of sustainability. When making strategic decisions, enterprises should form a holistic view of

operational efficiency, environmental responsibility, and future readiness. Among the key prospective directions of strategic asset management, we propose highlighting the following:

−the use of technological tools and solutions for proactive management;

−optimization of physical asset uses through energy-saving technologies and IoT solutions;

−accessibility of asset management tools, digital platforms, and analytical systems at different levels of strategic management;

−implementation of environmentally responsible approaches to asset management;

−application of data analytics to support well-grounded managerial decisions, including via outsourcing of specific tasks;

−strengthening security and risk management in the context of active digitalization of asset management systems.

**Conclusions.** Strategic asset management plays a crucial role in ensuring enterprise financial stability through optimal resource utilization and increased flexibility under conditions of rapid external change. Modern asset management strategies involve effective lifecycle management of assets using specialized systems, tools, and processes. Effective strategic asset management not only optimizes resource use but also enhances enterprise flexibility in a dynamic and unstable external environment.

Unlike an operational approach, strategic management implies systemic planning oriented to the entire lifecycle of assets, accounting for risks, ownership costs, and expected returns on investment. An essential element of the strategic approach is the development of a Strategic Asset Management Plan (SAMP), which ensures alignment between the enterprise's mission, vision, strategic goals, and practical actions in asset management. As part of the overall asset management strategy, it serves as a communication platform between various stakeholder groups – from investors and regulators to managers and staff – fostering transparency, engagement, and effective decision-making.

One of the key factors in effective asset management is the adoption of modern technologies to optimize costs and achieve strategic planning objectives. The implementation of such tools enables real-time asset monitoring, wear forecasting, optimized maintenance, and informed decision-making. Thus, strategic asset management should be understood not merely as a technical or financial function of the enterprise but as an integrated managerial concept that combines long-term planning, digital innovation, and cross-functional interaction. Its implementation is a necessary condition for achieving sustainable development, improving business process efficiency, and creating sustainable competitive advantages in the modern economic environment.

**References**

1. *Babiy, O., & Koynak, V. Modern Problems and Prospects of Enterprise Asset Management. Economy and Society.* 2024. № 59. DOI: https://doi.org/10.32782/2524-0072/2024-59-27 [in Ukranian]
2. Barbieri G., Vega A.S., Gutierrez J., Laserna J. and Mateus L.M. Strategic capital investments in asset management: a value-based approach. *Journal of Quality in Maintenance Engineering.* 2025. Vol. 31; No. 5. PP. 1-22. DOI: https://doi.org/10.1108/JQME-11-2023-0104
3. Blank, I. O. (2011). *Financial Support for Enterprise Development: Monograph*. Kyiv: KNTEU, 343 p [in Ukranian]
4. Brown K., Laue M., Tafur J., Mahmood M.N., Scherrer P., Keast R. An Integrated Approach to Strategic Asset Management. *Infranomics. Topics in Safety, Risk, Reliability and Quality.* 2014. Vol 24. DOI: https://doi.org/10.1007/978-3-319-02493-6_5
5. Budko, O., Kuksa, A., & Chehuta, M. (2024). Asset management system as a tool for company value growth. *Economic Bulletin of the Dnipro State Technical University*, 1(8), 70–76. DOI: https://doi.org/10.31319/2709-2879.2024iss1(8).306467pp70-76 [in Ukranian]
6. Burdonos, L., & Vynohradnia, V. (2023). Enterprise asset management in modern conditions. *Scientific Collection «InterConf»*, (160), 37–43. Retrieved from: https://archive.interconf.center/index.php/conference-proceeding/article/view/3938 [in Ukranian]
7. Chakradhar G., Apku Malika, Anusha, G., Madhavedi, Sudhakar. Comprehensive study of assets management company, focusing on investment strategies, performance, and regulatory. *Turkish Journal of Computer and Mathematics Education.* 2020. DOI: https://doi.org/10.61841/turcomat.v11i3.14489
8. DSTU ISO/TS 55010:2019. *Asset management – Guidelines for the alignment of financial and non-financial functions in asset management* (ISO/TS 55010:2019, IDT). Retrieved from: https://online.budstandart.com/ua/catalog/doc-page.html?id_doc=87906 (accessed: 02 July 2025)

9. Hvozdei, N. (2023). Enterprise asset management. *Scientific Innovations and Advanced Technologies*, 12, 332–341. DOI: https://doi.org/10.52058/2786-5274-2023-12(26)-332-341 [in Ukranian]
10. Heienko, M., & Omelyanenko, D. (2023). Methodological approaches to the analysis of the formation and use of assets under conditions of uncertainty and risk. *Bulletin of Sumy National Agrarian University*, 2(94). С. 19–24. DOI: https://doi.org/10.32782/bsnau.2023.2.4 [in Ukranian]
11. ISO 55000:2024 (en). Asset management – Vocabulary, overview and principles. Retrieved from: https://www.iso.org/obp/ui/en/#iso:std:iso:55000:ed-2:v1:en
12. Issa Diop, Georges Abdul-Nour, Dragan Komljenovic. Overview of Strategic Approach to Asset Management and Decision-Making. *International Journal of Engineering Research & Technology (IJERT). 2021*. Vol. 10, Issue 12. Retrieved from: https://www.ijert.org/overview-of-strategic-approach-to-asset-management-and-decision-making?utm_source=chatgpt.com
13. Pihul, N., Bondarenko, Ye., & Kyrychenko, A. (2021). Methodological principles for assessing the effectiveness of enterprise asset management. *Economy and Society*, (33). DOI: https://doi.org/10.32782/2524-0072/2021-33-20 [in Ukranian]
14. Savchenko, S. M., & Nikitin, V. H. (2021). The essence and principles of strategic management of enterprise performance efficiency. *Efficient Economy*. 2021. № 2. URL: http://www.economy.nayka.com.ua/?op=1&z=8656
15. Turylo, A. M. (2022). Relevance and characteristic features of the category “financial and economic management of enterprises”. *Bulletin of Kryvyi Rih National University*, 55, 88–93. [in Ukranian]
16. Zayachkivska, O., & Semeshchuk, S. (2021). Improving asset management mechanisms as a factor of sustainable enterprise development. *Bulletin of NUVGP*, 2(94), 46–52. [in Ukranian]

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**Стратегічне управління активами в системі фінансів підприємств**

***Анотація.*** **Вступ.** В умовах зростаючої складності бізнес-середовища, обмеженості ресурсів та високої динаміки технологічних змін стратегічне управління активами набуває особливої значущості для забезпечення фінансової стійкості та довгострокового розвитку підприємства. У статті розглядається стратегічне управління активами як стратегічний підхід, що дозволяє підприємствам формувати сталі конкурентні переваги, забезпечуючи узгодженість між інвестиційними рішеннями, технічним станом активів та стратегічними цілями.

**Постановка проблеми.** Відсутність системного підходу до управління активами знижує ефективність використання ресурсів та обмежує адаптивність підприємства до зовнішніх викликів. В сучасних дослідженнях процес управління активами часто висвітлюється фрагментарно, є недостатньо інтегрованим у загальну корпоративну стратегію.

**Невирішені аспекти проблеми.** Серед ключових аспектів, що потребують глибокого дослідження важливими є недостатнє використання цифрових технологій в ході управління активами, слабка комунікація між підрозділами, дефіцит фінансових ресурсів, а також відсутність екологічної складової у стратегічному плануванні.

**Метою дослідження.** Мета дослідження полягає в обґрунтуванні концептуальних засад стратегічного управління активами підприємства як основи для підвищення фінансової ефективності та формування довгострокових конкурентних переваг.

**Виклад основного матеріалу.** У статті визначено складові процесу управління активами, обґрунтовано теоретичні основи стратегічного підходу, виокремлено ключові проблеми та перспективні напрями його розвитку. Підкреслено важливість використання сучасних цифрових інструментів для побудови систем управління активами, аналітики даних, моніторингу та контролю життєвого циклу активів. Визначені основні проблеми управління активами, серед яких ключовими є: неефективне використання ресурсів, дефіцит фінансування, обмежене стратегічне планування, слабка інноваційна активність, складнощі нормативно-правового регулювання. Окрема увага приділена необхідності використання інтеграції даних у стратегічне планування та формуванню оптимального рівня міжпідрозділової комунікації, особливо з огляду на складності цифрового моніторингу та необхідності впровадження практик сталого розвитку на підприємствах.

**Висновки.** Стратегічне управління активами є інтегрованою управлінською концепцією, що поєднує довгострокове планування, цифрові інновації та міжфункціональну взаємодію. Сучасні інструменти стратегічного планування активами мають забезпечувати фінансову стійкість, гнучкість підприємства та сприяти сталому розвитку. Практична цінність отриманих результатів полягає у визначенні переліку компонентів системи стратегічного управління активами, обґрунтуванні інтересів різних груп стейкхолдерів в ході стратегічного планування управління активами.

***Ключові слова:*** *активи, управління, інструменти, фінанси підприємств, технології, ефективність*
Формули: –; рис.: 2; табл.: 3; бібл.: 16.

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**Список літератури**

1. Бабій О., Койнак В. Сучасні проблеми та перспективи управління активами підприємств. *Економіка та суспільство.* 2024. № 59. DOI: https://doi.org/10.32782/2524-0072/2024-59-27

2. Barbieri G., Vega A.S., Gutierrez J., Laserna J. and Mateus L.M. Strategic capital investments in asset management: a value-based approach. *Journal of Quality in Maintenance Engineering.* 2025. Vol. 31; No. 5. PP. 1-22. DOI: https://doi.org/10.1108/JQME-11-2023-0104
3. Бланк І.О. Фінансове забезпечення розвитку підприємств : монографія. К. : КНТЕУ, 2011. 343 с.
4. Brown K., Laue M., Tafur J., Mahmood M.N., Scherrer P., Keast R. An Integrated Approach to Strategic Asset Management. *Infranomics. Topics in Safety, Risk, Reliability and Quality.* 2014. Vol 24. DOI: https://doi.org/10.1007/978-3-319-02493-6_5
5. Будько О., Кукса А., Чехута М. Система управління активами як інструмент зростання вартості компанії. *Економічний вісник Дніпровського державного технічного університету.* 2024. № 1(8) С. 70-76 DOI: https://doi.org/10.31319/2709-2879.2024iss1(8).306467pp70-76
6. Бурдонос Л., Виноградня В. Управління активами підприємства в сучасних умовах. *Scientific Collection «InterConf»*. 2023. Вип. (160). С. 37–43. Retrieved from https://archive.interconf.center/index.php/conference-proceeding/article/view/3938
7. Chakradhar G., Apku Malika, Anusha, G., Madhavedi, Sudhakar. Comprehensive study of assets management company, focusing on investment strategies, performance, and regulatory. *Turkish Journal of Computer and Mathematics Education.* 2020. DOI: https://doi.org/10.61841/turcomat.v11i3.14489
8. ДСТУ ISO/TS 55010:2019 Управління активами. Настанови щодо узгодження фінансових та нефінансових функцій в управлінні активами (ISO/TS 55010:2019, IDT). URL: https://online.budstandart.com/ua/catalog/doc-page.html?id_doc=87906 (дата звернення: 02.07.25)
9. Гвоздєй Н. Управління активами підприємства. *Наукові інновації та передові технології.* 2023. Вип. 12. С. 332-341. DOI: https://doi.org/10.52058/2786-5274-2023-12(26)-332-341
10. Геєнко М., Омеляненко Д. Методичні підходи до аналізу формування та використання активів у рамках невизначеності та ризику. *Bulletin of Sumy National Agrarian University*. 2023. Вип. 2 (94). С. 19–24. DOI: https://doi.org/10.32782/bsnau.2023.2.4
11. ISO 55000:2024 (en). Asset management – Vocabulary, overview and principles. URL: https://www.iso.org/obp/ui/en/#iso:std:iso:55000:ed-2:v1:en
12. Issa Diop, Georges Abdul-Nour, Dragan Komljenovic. Overview of Strategic Approach to Asset Management and Decision-Making. *International Journal of Engineering Research & Technology (IJERT). 2021.* Vol. 10, Issue 12. URL: https://www.ijert.org/overview-of-strategic-approach-to-asset-management-and-decision-making?utm_source=chatgpt.com
13. Пігуль Н., Бондаренко Є., Кириченко А. Методичні засади оцінки ефективності управління активами підприємства. *Економіка та суспільство*. 2021. Вип. 33. DOI: https://doi.org/10.32782/2524-0072/2021-33-20
14. Савченко С.М., Нікітін В.Г. Сутність та принципи стратегічного управління ефективністю діяльності підприємства. *Ефективна економіка*. 2021. № 2. URL: http://www.economy.nayka.com.ua/?op=1&z=8656
15. Турило А. М. Актуальність і характерні особливості категорії «фінансово-економічний менеджмент підприємств». *Вісник Криворізького національного університету.* 2022. Вип. 55. С. 88–93.
16. Заячківська О., Семещук С. Удосконалення механізмів управління активами як чинник сталого розвитку підприємства. *Вісник НУВГП*. 2021. №2 (94). С. 46 – 52.

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# Volatility on stock exchanges and its impact on transformations in the financial services market

***Abstract.*** In modern global economy, stock market volatility has become one of the decisive factors shaping the financial services market. Exchange rate fluctuations not only affect asset valuation, but also investment decisions, risk management mechanisms, and the strategic development of financial institutions.

**Problem statement.** Despite significant research on volatility measurement and forecasting, there is insufficient analysis of how volatility drives structural transformation of the financial services market, especially under conditions of geopolitical instability, technological progress, and financial digitalisation.

**Unresolved aspects of the problem.** The interdisciplinary connection between volatility, financial innovations (cryptocurrencies, Big Data, AI-driven analytics), and transformations of financial services remains underexplored. Knowledge gaps concern the interaction of global spillover risks, geopolitical shocks, and the adaptive capacity of financial institutions.

**Purpose of the article.** The study aims to identify how stock exchange volatility influences transformations in the financial services market and to propose strategies for adaptation under instability and uncertainty.

**Presentation of the main material.** Using an interdisciplinary approach, the article combines theoretical analysis, systemic modelling, and review of empirical studies. It shows that volatility manifests through spillover effects across interconnected markets, amplified by geopolitical risks, and intensified by digital innovations such as algorithmic trading and cryptocurrencies. The author highlights the growing role of machine learning and AI in forecasting volatility, while emphasizing the limitations of algorithmic tools and the importance of combining them with expert financial analysis. Special attention is given to regional disparities, third-party risks, and the need for hybrid analytical platforms integrating local and global expertise.

**Conclusions.** Volatility is both a challenge and a driver of transformation in financial services. It accelerates the introduction of new technologies, changes risk management approaches, and demands new regulatory and analytical frameworks. A hybrid model combining digital tools and human expertise can mitigate risks, improve resilience of financial institutions, and expand access to financial services in underdeveloped markets. The results provide a foundation for adaptive strategies and future research on multi-level models of volatility assessment.

***Keywords:*** *volatility, stock market, risk management, digital technologies, geopolitical risks, machine learning, Big Data, financial services market, analytics, transformations.*

**JEL Classification:** F21; G15; G24.

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**Introduction.** In the current environment of global economic instability and dynamic changes in financial markets, the issue of volatility on stock exchanges has become particularly relevant. Fluctuations in the stock market affect not only the value of assets, but also the functioning of risk management systems, investment decisions and strategic approaches to the development of financial institutions. In particular, during periods of heightened geopolitical tension, economic crises or technological shifts, the level of volatility increases significantly, leading to chain reactions in the financial services market.

Contemporary research mostly focuses on analysing volatility in the context of individual financial instruments or national markets, but there is a lack of interdisciplinary and systematic analysis of its impact on transformational processes in the financial services sector. Given the rapid development of digital technologies, the emergence of new financial instruments (in particular, cryptocurrencies), and changes in consumer behaviour, there is a need for a deeper understanding of the relationship between stock market volatility and structural changes in the financial services market.

Thus, the relevance of this study lies in the need for a comprehensive analysis of the impact of stock market volatility on the transformation of financial services, which will allow us to formulate approaches to adapting financial strategies in conditions of increased risk and uncertainty.

**Literature review.** The issue of volatility on stock exchanges has become globally significant, covering a wide range of research in the fields of finance, economics, investment analysis and political economy. Scientific works of recent decades have shown rush progress in understanding the nature of volatility, the methodology of its measurement, sources and consequences for the financial services market.

The concept of volatility is widely used to assess risk in financial markets. The first approaches to assessing and forecasting volatility were developed within the framework of classical models, in particular the ARCH model proposed by Engle [14]. Engle, and later Black et al. [6], proved that volatility is dynamic and asymmetric, which became the basis for the development of GARCH models and their modifications, which are allowing to make more accurate consideration of the time dependence of market fluctuations.

Modern studies, notably by Christensen et al. [10] and Ding et al. [12], have expanded the range of volatility analysis tools by integrating artificial intelligence, machine learning algorithms, and Big Data to forecast market dynamics.

Increased global instability has also intensified the scientific debate on geopolitical risks as determinants of volatility. The works of Batten et al. [4], Yilmazkuday [26] and Salisu [20] show that geopolitical shocks, such as war or international conflicts, can cause avalanche effects in stock markets, which are then transmitted to other sectors of the financial services market. At the same time, Baruník et al. proved that negative information has a much stronger impact on volatility than positive information and even than the occurrence of a negative event itself [3].

The international dimension of volatility is actively researched in the context of so-called ‘spillover effects’ in the works of Chen et al. [9], which confirm Hong Kong’s intermediary role in transmitting volatility from the United States to China. Similar effects are observed in other regions, indicating the need for comprehensive intermarket analysis.

Christoffersen et al. investigated the relationship between asset returns, volatility forecasting, and market dynamics [11]. The works of Ding et al. point to the growing role of analysts as intermediaries between investors and markets, especially in countries with limited access to information [12], while Twedt and Rees explore the shortcomings of traditional analytics, such as bias, excessive influence of colleagues, and limited local knowledge [21].

Thus, the literature demonstrates the multifaceted nature of volatility issues: from mathematical modelling to socio-economic analysis of its impact. All of these approaches emphasise the need for integrated interdisciplinary solutions to ensure the stability and development of the financial services market in conditions of global turbulence, although this issue has not been clearly reflected in contemporary research, which is a significant gap that needs to be filled.

**Purpose, objectives and research methods.** The purpose of the study is to identify the nature of the impact of volatility on stock exchanges on transformation processes in the financial services market, as well as to formulate approaches to adapting financial strategies in conditions of increased instability.

The objectives of this study are summarising of current scientific approaches to the interpretation and classification of volatility in financial markets and investigation of the sources and factors of volatility in relation to the development of digital financial technologies, as well as, based on the results of the research, identifying trends in the transformation of the financial services market under the influence of volatility on stock exchanges and measures that can mitigate the negative impact of volatility in the long term.

The research used an interdisciplinary approach, including theoretical analysis of scientific literature on economics, finance, risk management and digital technologies; a structural-functional approach for identifying the interrelationships between stock markets and financial services market segments; systemic analysis of global risks, their spillovers and secondary effects; content analysis of empirical studies on the application of machine learning, algorithmic trading and Big Data tools in the financial sector; and expert assessment methods and logical generalisation methods for formulating conclusions and proposals to mitigate the negative impact of volatility.

**Research results.** Research results demonstrate the complexity and ambiguity of the concept of volatility on stock exchanges and in the context of financial markets in general. In general terms, volatility can be defined as the degree of deviation of asset prices from their average values in dynamics, which is a key indicator of risk and market sentiment for investors and other market participants [18]. Its importance is also determined by the fact that it has a decisive influence on risk management procedures, investment and development strategies, as well as overall market dynamics.

Volatility is not a monolithic and unambiguous concept; it takes many different forms, and its impact has multifactorial significance for different financial instruments. The development of FinTech also leads to the emergence of additional factors that cause volatility. In particular, one of them is the emergence of cryptocurrencies and crypto exchanges. This, in turn, has led to the need to modify traditional volatility models and develop innovative methods adapted to the unique characteristics of these markets [15].

The complexity of studying the impact of volatility on key actors of the financial market, as well as of the financial services market, is caused by the fact that this concept is not a homogeneous metric, but rather it encompasses various dimensions, which often provide an opportunity not so much to clearly model the situation or prepare a forecast, but rather to gain a nuanced understanding of market behaviour. This is confirmed by calculations, in particular by the ARCH method, which helps to calculate conditional volatility – the degree of price fluctuations in future periods based on prices in past periods [14]. The situation is further complicated by the fact that the difference between predicted and actual volatility can be significant [6].

It has also been found that volatility is crucial in risk management, portfolio optimisation and the pricing of derivative financial instruments in financial markets. Investors rely on volatility to assess investment risks and adjust their portfolios accordingly, while traders use volatility indicators, such as the VIX (volatility index), to assess market sentiment and adapt their strategies to changing conditions [18].

At the same time, it has been found that during periods of high volatility between the stock markets of related countries, appears a so-called spillover of risks [23], which significantly complicates the processes of volatility forecasting, risk assessment, and profitability of operations, and also has a significant indirect impact on the international financial services market in general. Spillovers, in particular, are not necessarily one-sided and may have a more complex structure. Also, they do not always occur evenly and equally among all connected countries [17]. This phenomenon contributes to increased global uncertainty and instability in the financial system and creates a basis for additional research and changes to existing stock portfolio management

strategies, as well as to the functioning of the financial services market in general. The impact of such factors becomes particularly noticeable in conditions of growing global instability, when it is exacerbated by other factors, in particular geopolitical risk.

Geopolitical risks have a rather complex impact on the stock market and the financial services market in general. This is influenced by the large number of disparate sources of geopolitical risks, as well as the fact that their impact will vary significantly depending on the combination of such risks and the country in question. The heterogeneity of their impact on sectoral indices is proven, in particular, by Cadena-Silva et al. using the example of the United States [8]. The situation is further complicated by the fact that they can have both negative and positive effects at the same time, which potentially offset each other, making it difficult to determine the factor that caused the overall change in stock market volatility. In such conditions, research based solely on complex indices that assess geopolitical actions or threats is ineffective [8], and fluctuations on stock exchanges caused by geopolitical risks have a significant impact on both financial stability and the financial services market in general. This is confirmed by studies by Batten et al. [4] and Yilmazkuday [25], who proved that governments, companies and investors can adapt relatively quickly to new circumstances after serious exogenous shocks, and sometimes such shocks and the resulting fluctuations on the stock exchanges can have a positive effect on the financial market in the future.

The impact of geopolitical risks is complicated by the fact that stock market volatility reacts more sensitively to bad news than to good news [3], which in turn becomes particularly important in conditions of global instability and escalating international conflicts, as well as their related consequences, particularly in the political environment. The fluctuations caused by this have a significant impact on the financial market as a whole, as well as on the services provided. In fact, every type of financial institution has to adapt to the new realities in one way or another. It is becoming increasingly difficult to ensure the stability of previously established processes, including in the financial services market. Such changes also lead to the transformation of the market in line with the new needs and challenges of the modern world.

**Discussion.** Volatility on stock exchanges is not a new phenomenon. Despite numerous studies in this area, there is a need to study its impact on the financial services market, as the stock market is dynamic. The emergence of new financial services and instruments leads to changes in the stock market and, consequently, affects volatility, and vice versa. The financial services market and stock exchanges are not only closely interrelated (Fig. 1), but are also influenced by a significant number of external and internal factors, which only amplifies the impact of each individual factor and makes it more difficult to research.

Given the level of interconnection between them, the modern key problem is that most studies focus on specific issues related to volatility, markets or individual factors and their impact on the financial services market or the financial system of a particular country. Also the most of existing studies focus on examining the risks that are causing volatility in the stock market, ways to assess their impact, and forecasting dynamics. However, given the development of the financial services market and the global instability that is only intensifying, and the globalisation of world financial markets, there is a need to study general trends in the transformation of financial services under the influence of volatility on stock exchanges, as well as to determine which areas of possible transformation could mitigate the negative effects of volatility in the long term perspective.

First and foremost, in this context is the development of technology. This has led to changes in both the approaches to defining and forecasting volatility and the factors that influence volatility itself.

On the one hand, a completely new financial market has emerged – the cryptocurrency market. Even the most stable cryptocurrencies are characterised by high volatility, atypical distribution and limited retrospective data. This has led to new challenges in measuring volatility, but has also opened up new opportunities in this area [15].

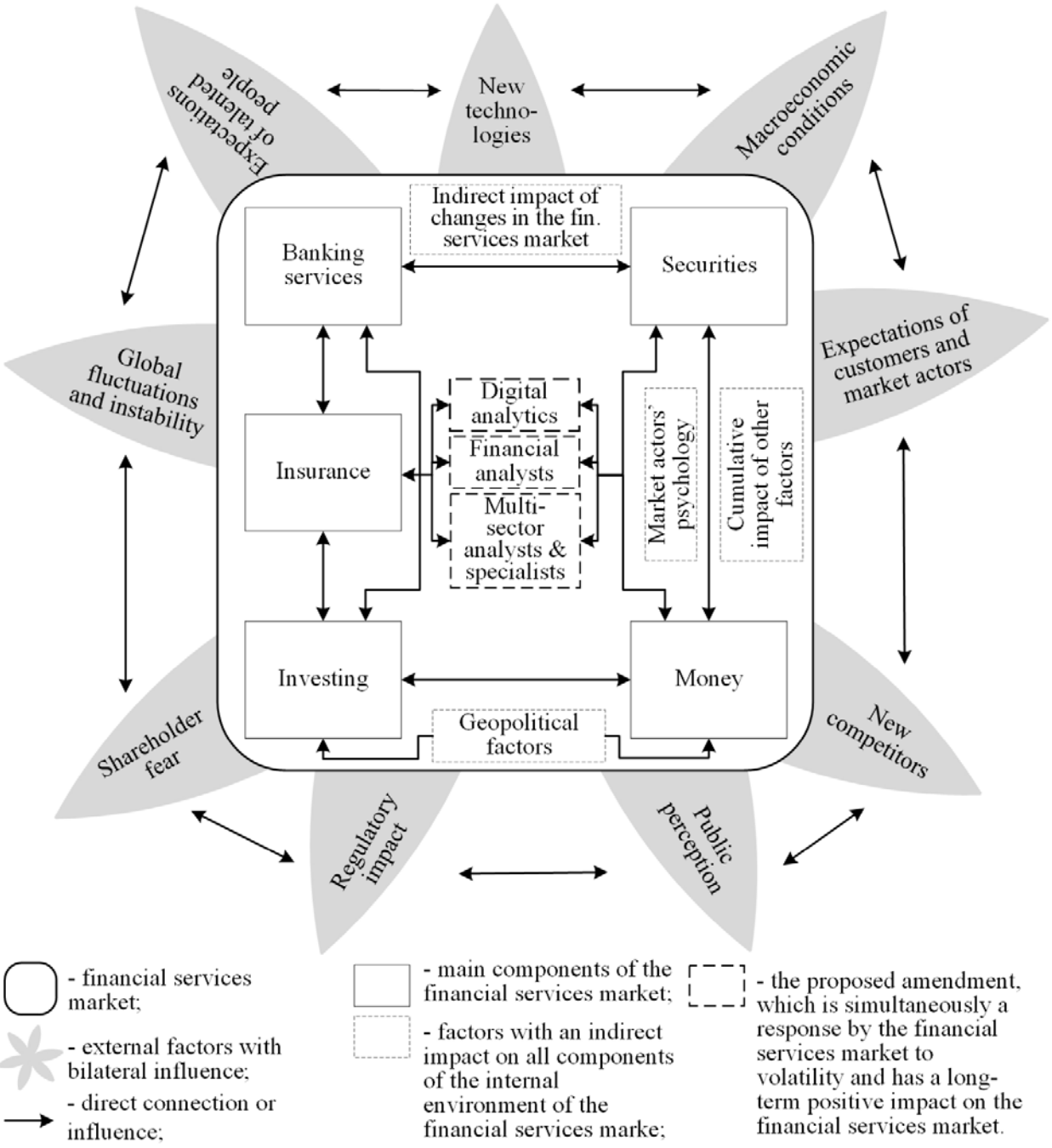


*Figure 1. Interrelationships between the external and internal environment of the financial services market*
*Source: prepared by the author*

On the other hand, experts and scientists have been able to use machine learning methods, artificial intelligence, and Big Data to forecast volatility more accurately and quickly. Such tools allow combining different types of analysis and tracking dynamics in real time, as well as quickly adjusting forecasts.

The positive impact of such tools is noticeable, and the influence of volatility on the development of financial instruments is also clearly evident, as not only has data analytics been incorporated as a basic element into the bulk of financial services, but algorithmic trading has also emerged [19], which in turn, through the butterfly effect, has led to a series of subtle but significant transformations in related financial services. This allows us to hypothesise that the use of machine

learning models will improve the process of forecasting volatility and its consequences, and the integration of appropriate tools into the systems used in the provision of other financial services will allow to optimise and automate processes, mitigate risks and will have a profound positive impact on the risk management strategies of all financial market actors.

To a certain extent, this assumption is correct, as analysis has shown that the use of neural networks, random forests, machine learning algorithms, and support vector methods allows to identify complex patterns in the analysis of large data sets, as well as to adapt them to conditions of dynamic environment [10]. This has resulted in more and more financial services companies starting to use them in their activities or using the services of firms that perform such analysis on a professional basis. However, it has been found that this direction of development cannot help to solve the existing problem and requires additional solutions, because relying solely on the results of algorithmic analysis can lead to associated challenges that could potentially cause even more negative consequences than an incorrect volatility forecast. This is related to one of the main functions of financial analytics – data interpretation, which in many approaches to machine learning is perceived as a 'black box' that does not provide an understanding of the internal workings of models and complicates the understanding of the results they offer, and therefore the reliability of the forecast [10; 12].

Another important consequence of volatility is the complication in adapting financial services to the needs of specific regions. In the case of international markets, the situation is exacerbated. In this case, we are also talking not only about the need to assess the risks, prospects and characteristics of the development or adaptation of specific services not only to the characteristics of a particular region, but also about taking into account the impact of these characteristics and volatility on each of the markets in general on the specifics of providing a particular financial service. In particular, it has been proven that the psychology of actors of each market, as well as the specifics of national legislation, mentality and interrelationships form different patterns of behaviour, as well as responses to challenges, shocks and fluctuations in the stock market [8]. Thus, volatility in interconnected markets, as well as its impact on financial services that are in one way or another related to the stock market or depend on international markets or operations, can be compared to the ripples caused by a stone thrown into water – it brings about changes in one way or another, even if such changes are not global. Although it could be assumed that such an impact is more characteristic of global markets and that local markets will remain virtually unaffected by fluctuations, as they are less dependent on the external environment, this assumption would not be fair. Although local markets are less dependent on volatility in the global market, currency fluctuations, pricing issues, raw material procurement and product sales, insurance against various types of risks, and a number of other factors affecting the stability and financial condition of the enterprise, including its development and activity strategies, remain relevant for them. Thus, all actors of the financial services market must, in one way or another, adapt to fluctuations in the stock market and, at the very least, include them in risk management and take them into account when planning trends for future periods.

Another reason for the increase in regional risk to the development of the financial services market, related to stock market volatility, is the spillover of risks from the market of one country to the market of another. Chen et al. demonstrated this using the example of the impact of volatility in the United States stock market on the Chinese stock market and also highlighted the associated risks [9]. This exacerbates the problem of assessing and forecasting risks for virtually all types of financial services. The spillover of risks caused by volatility is also closely related to the impact of geopolitical risks. Although the latter themselves have a significant impact on the financial services market, especially in times of instability and global shifts, the destruction of part of the existing chains for both production and service provision, they also amplify the destabilising impact of volatility also due to the heterogeneity of responses to market fluctuations and geopolitical changes in different sectors of the economy. This is emphasised, in particular, by the research of

Yilmazkuday [26], while Umar et al. [22], in turn, prove that the impact of geopolitical risk on asset returns depends on the type of market and market conditions, which necessitates a more in-depth analysis of the market and an assessment of the impact of various factors on each individual industry. On the other hand, studies by Bouri et al. [7] and Lee and Lee [17] show that rapid changes in the geopolitical dimension, as well as deepening global instability, particularly in the context of security, complicate the problem of the influence of volatility, as the market begins to react to these changes in different ways, the differences in reactions becoming increasingly noticeable not only depending on the country or region, but also on the specific industry, which exacerbates systemic risk and leads to the need for in-depth analysis and increased attention to emerging risks, as well as their accompanying impact on the transformation of financial instruments.

This assumption correlates with the thesis of Salisu et al. [20] that geopolitical risk threats have a relatively more pronounced impact on stock market returns than geopolitical risk actions as such. In other words, tracking trends and forecasting their possible impact on the financial services market becomes more important than adapting to the consequences of the risk itself. Thus, analytical activity takes on particular importance. The growing role of analysts is indirectly confirmed by Ali et al. [1], as their research shows that various sectors of the United States economy can generate significant positive returns facing with geopolitical threats, which requires further study and analysis.

Another important factor to consider when assessing the impact of stock market volatility on the financial services market is the formation of third-party risk. The point is that most companies are directly or indirectly dependent on stock market fluctuations, and significant changes in the environment or situation of one inevitably affect the other. These can be direct relationships based on the supplier-consumer principle, the client of services, in particular financial services, and the supplier, as well as relationships within industries, when significant changes in the position of one company lead to a redistribution of the market by others. In this case, volatility will have an additional impact on all market participants through a specific company. This impact is usually quite difficult to track and calculate, as it can be cumulative in nature, and the internal environment of a firm can only be analysed to a certain extent. Therefore, such risks and their impact on the financial services market as a whole are generally difficult to research and predict.

Another factor related to third-party risk that has a significant impact on the transformation of the financial services market is the formation of not only direct but also indirect links between markets in different countries. In other words, the influence of one country’s stock market on another is largely mediated by one or more other countries. This can be caused by a number of different factors, such as the formation of production chains, indirect trade, sanctions, direct conflicts between specific countries, trading characteristics, geographical proximity, etc. In such cases, the volatility of one country’s stock market can have a completely different, unpredictable impact on the markets of another country.

Research by Chen et al. [9] clearly demonstrates such effects using the example of the impact of United States stock market volatility on the Chinese stock market via Hong Kong. The researchers prove the importance of the intermediary and analyse its impact on the distortion of the standard forecast regarding the direct impact of United States market volatility on the Chinese market. This study leads to the conclusion that the intermediation of other countries has similar consequences. In other words, assessing the impact of volatility on the financial services market in such conditions requires an even more comprehensive and in-depth analysis.

Thus, having researched the peculiarities of the impact of volatility in the stock market on the financial services market, we conclude that it has a direct and immediate impact on it and necessitates the transformation of financial instruments, management strategies, as well as approaches to conducting activities and providing services.

Based on the above, it can be assumed that a logical solution in such conditions would be to

develop a comprehensive multi-stage methodology for assessing the impact of volatility, taking into account various factors and relationships based on digital technologies, while access to it should be provided to all financial services market actors in the context of their activities, for example, based on specific analysis parameters and necessary relationships, as well as the sector of the economy and field of activity. However, it should be noted that such a solution cannot be supported and provided, both in terms of resources and information, by a single organisation or financial service providers from a specific region, because it would be potentially too costly. In addition, its support would require a significant amount of data and corrective coefficients or parameters in real time. Moreover, such a solution cannot function without the constant intervention of experts who can adjust the algorithms to take into account changes in people's behaviour in different countries around the world.

Potentially, it will be costly and require constant investment, and there will also be issues of compliance and scalability. A failure or the entry of inaccurate data by one of the operators or participants in the core of the system will lead to the formation of a whole series of incorrect reports, and it will be extremely difficult to correct such errors and algorithms. Also, as already mentioned, a problematic issue is the internal processes in machine learning and artificial intelligence models, which do not provide a clear understanding of the algorithm and how exactly the forecast or report is formed [10; 12]. This means that in the case of multifactorial models, which include a large amount of variables and will depend to a large extent not on objective indicators and specific data, but on more abstract concepts and user psychology, cultural characteristics, behavioural patterns, and will also take into account a significant array of indirect connections, significantly complicated by data from various areas of economic activity, – the reliability of the obtained results will be minimal. Even if we assume that separate automated risk analysis and volatility forecasting systems will be created to work with data from specific industries or markets, and an independent superstructure will function, which will operate the results of lower-level systems and supplement their data with additional factors of influence specific to particular countries or markets, the reliability of the data will potentially be even lower. In addition, there is the risk of failures and the risk of third parties in the context of Big Data [24].

Thus, it is clear that volatility on stock exchanges leads to a certain consolidation of needs and challenges in the financial services market, which are faced by virtually all its participants, as well as to the need to transform the financial services market in the direction of deepening and specialising risk management and comprehensive analytical activities. The results of the study also show that although digital tools can help to a certain extent in solving the above-mentioned problems, they cannot become the basis for decision-making and business processes.

Given the complexity of the issue and the results obtained from the study, it can be concluded that the solution to the problem of volatility's impact on the financial services market could be a combination of machine learning and artificial intelligence tools and an increased role for diverse analysts in the stock market with the subsequent dissemination of key information from them to other financial services market participants for building of their own development and transformation strategies based on it. This assumption is supported by research results showing the positive effect of machine learning and artificial intelligence tools on the processing of large data sets and the identification of certain patterns [10]. At the same time, increasing the role and involvement of analysts will reduce errors resulting from automated algorithm-based assessments, supplement basic analysis with empirical research results, as well as other previously unaccounted factors that lie more in the realm of understanding the functioning and connections of a particular market based on psychological and traditional factors, as well as taking into account the behaviourism of representatives of a particular region. Research by Jeong et al. [16] support this assumption, as they have demonstrated the growing role of international analysts as intermediaries in the global financial environment, and in particular that the existence of an international analytical network significantly reduces barriers to investor access to foreign assets, especially in countries

with underdeveloped information infrastructure. These studies also showed a steady natural growth in the number of financial analysts in the international stock market between 1987 and 2020 [16].

This confirms our assumption, and in particular that the market itself is gradually transforming in this direction under the influence of contemporary challenges. The need for truly multifaceted and broad-based expertise is confirmed, in turn, by the research of Twedt and Rees [21], who argue that the activities of financial analysts alone have certain significant shortcomings. These include, in particular, the fact that financial analysts tend to significantly exaggerate both negative and positive scenarios when making forecasts and assessments, use the opinions of other analysts as the basis for their reports, and a number of other reasons, such as language barriers, limited access to local markets and information about them, focusing on data from a specific region in a broad sense without knowledge of its specifics and peculiarities of local behaviourism, and as a result a lack of data and unreliability of judgements despite the significant authority of their conclusions, material costs and time spent on their formation, can lead to significant losses on the part of the customer of the analytical conclusion. This gap in analytics and the problem of incomplete data can be compensated for by local financial services market specialists who can potentially also carry out analytical activities. They have better information about the situation in the local market and can take into account the influence of factors with a higher degree of reliability, including the moods of financial services market actors, which are overlooked by classical financial analysts. They also have direct access to local businesses and companies, including those providing financial services, have in-depth knowledge of local markets, and do not face language barriers, which only increases the reliability of their assessments.

Filling this information gap will also have a positive impact on global investment by increasing the availability of necessary information and enabling more accurate forecasting of the impact of stock market volatility on investments, which also correlates with the research of Baik et al. [2] and Döring et al. [13]. This approach will also reduce the cost of obtaining the necessary information, which will potentially contribute to the revitalisation and to the activation of the stock market and financial services market in regions where they remain underdeveloped. This is because when choosing a company to invest in, an investor, given equal costs of obtaining information about two companies, usually chooses the one that is more familiar or about which more information can be gathered. That is why, when investing globally, they are at a disadvantage compared to local investors in the capital market of the host country, which is why their risk increases, in particular due to the exacerbation of geopolitical risk and market volatility risk [5]. Analytical activities by both intermediaries in the financial market and other actors in the financial services market will help to solve this problem and are also in line with trends that have already begun to form naturally. Thus, we conclude that the consolidation and deepening of analytical activities by specialists in various fields and financial analysts, as well as combining it with specialised digital tools and machine learning algorithms, is not only a logical consequence of the transformation of the financial services market under the influence of volatility on stock exchanges, but will also help in the long term perspective to mitigate its negative impact on all financial services market actors and revive previously depressed markets.

**Conclusions.** The study concluded that volatility on stock exchanges is not only a key indicator of market changes, but also one of the main factors driving the transformation of the modern financial services market. It influences the structure and logic of functioning of financial instruments, stimulates the introduction of new technologies, changes approaches to risk management, and determines the priorities of strategic planning in financial institutions.

The scientific novelty of the study lies in a comprehensive approach to analysing the impact of volatility on the transformation of the financial services market, taking into account digital transformation, geopolitical factors, spillover risks between the markets, as well as in the proposal for the systematic integration of local specialised analytical expertise and digital tools as a basis for overcoming the negative effects of volatility.

The results of the study allow to deepen understanding of the interrelationships between stock markets and financial services market components, and contribute to the formation of a concept for approaches to assessing and adapting the financial services market to the impact of stock market volatility in conditions of global instability. The results obtained during the study can be used to develop effective risk management strategies, optimise financial services in light of unstable market conditions, improve digital financial products and introduce adaptive volatility forecasting models, as well as during planning changes in the directions of financial intermediaries' activities and requirements for their qualifications. This, in turn, will contribute to increasing the resilience of the financial system to external shocks, reducing losses from unexpected fluctuations, improving access to analytical information for all market participants, and increasing the level of financial activity in regions with low levels of financial services market development.

Prospects for further research lie in the development of multi-level models for assessing the impact of volatility, taking into account behavioural factors, local characteristics of financial markets and cultural contexts, as well as in studying the practical effect of creating hybrid analytical platforms with data unification for a wide range of financial services market participants.

**References**

1. Ali, S.R.M., Anik, K.I., Hasan, M.N. & Kamal, M.R. (2023). Geopolitical threats, equity returns, and optimal hedging. *International Review of Financial Analysis*, *90*, 102835. DOI: https://doi.org/10.1016/j.irfa.2023.102835.
2. Baik, B., Kang, J.-K., Kim, J.-M. & Lee, J. (2013). The liability of foreignness in international equity investments: evidence from the US stock market. *Journal of International Business Studies*, *44*, 391-411. DOI: 10.1057/jibs.2013.13.
3. Baruník, J., Kočenda, E. & Vácha, L. (2016). Asymmetric connectedness on the U.S. stock market: Bad and good volatility spillovers. *Journal of Financial Markets*, *27*, 55-78. DOI: https://doi.org/10.1016/j.finmar.2015.09.003.
4. Batten, J.A., Boubaker, S., Kinateder, H., Choudhury, T. & Wagner, N.F. (2023). Volatility impacts on global banks: Insights from the GFC, COVID-19, and the Russia-Ukraine war. *Journal of Economic Behavior and Organization*, *215*, 325–350. DOI: https://doi.org/10.1016/j.jebo.2023.09.016.
5. Bell, R. G., Filatotchev, I. & Rasheed, A. A. (2012). The liability of foreignness in capital markets: sources and remedies. *Journal of International Business Studies*, *43*, 107-122. DOI: https://doi.org/10.1057/jibs.2011.55.
6. Black, F., & Scholes, M. (1973). The pricing of options and corporate liabilities. *Journal of Political Economy*, *81*(3), 637-654. DOI: https://doi.org/10.1086/260062.
7. Bouri, E., Hammoud, R. & Abou Kassm, C. (2023). The effect of oil implied volatility and geopolitical risk on GCC stock sectors under various market conditions. *Energy Economics*, *120*, 106617. DOI: https://doi.org/10.1016/j.eneco.2023.106617.
8. Cadena-Silva, J.P., Lara, J.Á.S. & Fernández, J.M.R. (2025). Stock market volatility and oil shocks: A study of G7 economies. *International Review of Financial Analysis*, *103*, 104218. DOI: https://doi.org/10.1016/j.irfa.2025.104218.
9. Chen, Y.-L., Yang, J.J. & Chang, Y.-T. (2025). Stock market volatility spillovers from U.S. to China: The pivotal role of Hong Kong. *Pacific-Basin Finance Journal*, *90*, 102670, DOI: https://doi.org/10.1016/j.pacfin.2025.102670.
10. Christensen, K., Siggaard, M., & Veliyev, B. (2023). A Machine Learning Approach to Volatility Forecasting. *Journal of Financial Econometrics*, *21*(5), 1680-1727. DOI: https://doi.org/10.1093/jjfinec/nbac020.
11. Christoffersen, P., & Diebold, F. X. (2006). Financial asset returns, direction-of-change forecasting, and volatility dynamics. *Management Science*, *52*(8), 1273-1287. DOI: https://doi.org/10.1287/mnsc.1060.0575.
12. Ding, S., Cui, T. & Zhang, Y. (2022). Futures volatility forecasting based on big data analytics, incorporating an order imbalance effect. *International Review of Financial Analysis*, *83*, 102255. DOI: https://doi.org/10.1016/j.irfa.2022.102255.
13. Döring, S., Drobetz, W., El Ghoul, S., Guedhami, O. & Schröder, H. (2021). Institutional investment horizons and firm valuation around the world. *Journal of International Business Studies, 52*, 212-244. DOI: 10.1057/s41267-020-00351-9\.
14. Engle, R. F. (1982). Autoregressive conditional heteroskedasticity with estimates of the variance of United Kingdom inflation. *Econometrica*, *50*(4), 987-1008. DOI: https://doi.org/10.2307/1912773.
15. Gupta, H. & Chaudhary, R. (2022). An empirical study of volatility in the cryptocurrency market. *Journal of Risk and Financial Management*, *15*(11), 1-15. DOI: https://doi.org/10.3390/jrfm15110513.
16. Jeong, Y.-C., Yu, J. & Ryu, W. (2024). Connecting Cross-Border Market Participants: The Intermediary Role of International Analysts in Global Capital Markets. *Journal of Management Studies*, *61*, 6, 2535-2569. DOI: https://doi.org/10.1111/joms.12988.
17. Lee, C.-C. & Lee, C.-C. (2023). International spillovers of U.S. monetary uncertainty and equity market volatility to China's stock markets. *Journal of Asian Economics*, *84*, 101575. DOI: https://doi.org/10.1016/j.asieco.2022.101575.
18. Rohilla, A. & Tripathi, N. (2022). A study on investors' sentiment and market returns of the Indian stock market. In (M. K. Mohanty, Ed.). *Orissa Journal of Commerce*, *43*(4). DOI: https://doi.org/10.54063/ojc.2022.v43i04.02.
19. Roy, G., Fiaidhi, J. & Mohammed, S. (2022). Multi-Timeframe Algorithmic Trading Bots Using Thick Data Heuristics with Deep Reinforcement Learning. *Artificial Intelligence Evolution*, *3*, *2*, 107–159. DOI: https://doi.org/10.37256/aie.3220221722.
20. Salisu, A.A., Lasisi, L. & Tchankam, J.P. (2022). Historical geopolitical risk and the behaviour of stock returns in advanced economies. *The European Journal of Finance*, *28*(9), 889-906. DOI: https://doi.org/10.1080/1351847X.2021.1968467.

21. Twedt, B. & Rees, L. (2012). Reading between the lines: an empirical examination of qualitative attributes of financial analysts' reports. *Journal of Accounting and Public Policy, 31*, 1-21. DOI: https://doi.org/10.1016/j.jaccpubpol.2011.10.010.
22. Umar, Z., Bossman, A., Choi, S.-Y. & Teplova, T. (2022). Does geopolitical risk matter for global asset returns? Evidence from quantile-on-quantile regression. *Finance Research Letters, 48*, 102991. DOI: https://doi.org/10.1016/j.frl.2022.102991.
23. Wang, B. & Xiao, Y. (2023). Risk spillovers from China's and the US stock markets during high-volatility periods: Evidence from East Asianstock markets. *International Review of Financial Analysis, 86*, 102538. DOI: https://doi.org/10.1016/j.irfa.2023.102538.
24. World Economic Forum. (2024). Global cybersecurity outlook 2024. https://www.weforum.org/publications/global-cybersecurity-outlook-2024/.
25. Yilmazkuday, H. (2023). COVID-19 effects on the S&P 500 index. *Applied Economics Letters, 30*(1), 7–13. DOI: https://doi.org/10.1080/13504851.2021.1971607.
26. Yilmazkuday, H. (2024). Geopolitical risk and stock prices. *European Journal of Political Economy, 83*, 102553. DOI: https://doi.org/10.1016/j.ejpoleco.2024.102553.

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**Волатильність на фондових біржах і її вплив на трансформації ринку фінансових послуг**

***Анотація.*** У сучасній світовій економіці волатильність фондових ринків стала одним із ключових факторів трансформації ринку фінансових послуг. Коливання цін на фондових біржах впливають не лише на оцінку активів, але й на інвестиційні рішення, механізми управління ризиками та стратегічний розвиток фінансових установ.

**Постановка проблеми.** Попри значну кількість досліджень щодо розрахунку та прогнозування волатильності, недостатньо вивчено її вплив на структурні зміни у сфері фінансових послуг, особливо в умовах геополітичної нестабільності, технологічних зрушень та цифровізації фінансів.

**Нерозв'язані аспекти.** Недостатньо дослідженим залишається міждисциплінарний зв'язок між волатильністю, фінансовими інноваціями (криптовалюти, Big Data, аналітика на основі ШІ) та трансформацією фінансових послуг. Прогалини стосуються взаємодії переливів глобальних ризиків, геополітичних шоків та адаптаційних можливостей фінансових установ.

**Мета статті.** Дослідження має на меті визначити як волатильність на фондових біржах впливає на трансформації ринку фінансових послуг та запропонувати стратегії адаптації в умовах нестабільності та невизначеності.

**Основний матеріал.** На основі міждисциплінарного підходу поєднано теоретичний аналіз, системне моделювання та узагальнення емпіричних досліджень. Доведено, що волатильність проявляється через ефекти переливів між взаємопов'язаними ринками, посилюється геополітичними ризиками та цифровими інноваціями (алгоритмічна торгівля, криптовалюти). Відзначено зростання ролі штучного інтелекту та машинного навчання у прогнозуванні волатильності, але підкреслено необхідність їх поєднання з експертною фінансовою аналітикою. Окремо проаналізовано регіональні відмінності, ризики третіх сторін та важливість гібридних аналітичних платформ.

**Висновки.** Волатильність виступає як загрозою, так і рушієм трансформацій ринку фінансових послуг. Вона стимулює впровадження нових технологій, змінює підходи до управління ризиками та вимагає нових регуляторних і аналітичних інструментів. Гібридна модель, що поєднує цифрові технології та експертні знання, здатна зменшити ризики, підвищити стійкість фінансових установ і розширити доступ до фінансових послуг на слаборозвинених ринках. Отримані результати формують основу для адаптивних стратегій і подальших досліджень багаторівневих моделей оцінки волатильності.

***Ключові слова:*** *волатильність, фондові біржі, ризик-менеджмент, цифрові технології, геополітичні ризики, машинне навчання, Big Data, ринок фінансових послуг, аналітика, трансформації.*

**JEL Classification:** F21; G15; G24.

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**Список літератури**

1. Ali S.R.M., Anik K.I., Hasan M.N., Kamal M.R. Geopolitical threats, equity returns, and optimal hedging. *International Review of Financial Analysis*. 2023. №90. 102835. DOI: https://doi.org/10.1016/j.irfa.2023.102835.
2. Baik B., Kang J.-K., Kim J.-M., Lee J. The liability of foreignness in international equity investments: evidence from the US stock market. *Journal of International Business Studies.* 2013. №44. С. 391-411. DOI: 10.1057/jibs.2013.13.
3. Baruník J., Kočenda E., Vácha L. Asymmetric connectedness on the U.S. stock market: Bad and good volatility spillovers. *Journal of Financial Markets*. 2016. №27. С. 55-78. DOI: https://doi.org/10.1016/j.finmar.2015.09.003.
4. Batten J.A., Boubaker S., Kinateder H., Choudhury T., Wagner N.F. Volatility impacts on global banks: Insights from the GFC, COVID-19, and the Russia-Ukraine war. *Journal of Economic Behavior and Organization.* 2023. №215. С. 325–350. DOI: https://doi.org/10.1016/j.jebo.2023.09.016.
5. Bell R. G., Filatotchev I., Rasheed A. A. The liability of foreignness in capital markets: sources and remedies. *Journal of International Business Studies.* 2012. №43. С. 107-122. DOI: https://doi.org/10.1057/jibs.2011.55.
6. Black F., Scholes M. The pricing of options and corporate liabilities. *Journal of Political Economy*. 1973. №81(3). С. 637-654. DOI: https://doi.org/10.1086/260062.
7. Bouri E., Hammoud R., Abou Kassm C. The effect of oil implied volatility and geopolitical risk on GCC stock sectors under various market conditions. *Energy Economics*. 2023. №120. 106617. DOI: https://doi.org/10.1016/j.eneco.2023.106617.
8. Cadena-Silva J.P., Lara J.Á.S., Fernández J.M.R. Stock market volatility and oil shocks: A study of G7 economies.

*International Review of Financial Analysis.* 2025. №103. 104218. DOI: https://doi.org/10.1016/j.irfa.2025.104218.
9. Chen Y.-L., Yang J.J., Chang Y.-T. Stock market volatility spillovers from U.S. to China: The pivotal role of Hong Kong. *Pacific-Basin Finance Journal*. 2025. №90. 102670. DOI: https://doi.org/10.1016/j.pacfin.2025.102670.
10. Christensen K., Siggaard M., Veliyev B. A Machine Learning Approach to Volatility Forecasting. *Journal of Financial Econometrics*. 2023. №21(5). С. 1680-1727. DOI: https://doi.org/10.1093/jjfinec/nbac020.
11. Christoffersen P., Diebold F. X. Financial asset returns, direction-of-change forecasting, and volatility dynamics. *Management Science*. 2006. №52(8). С. 1273-1287. DOI: https://doi.org/10.1287/mnsc.1060.0575.
12. Ding S., Cui T., Zhang Y. Futures volatility forecasting based on big data analytics, incorporating an order imbalance effect. *International Review of Financial Analysis*. 2022. №83. 102255. DOI: https://doi.org/10.1016/j.irfa.2022.102255.
13. Döring S., Drobetz W., El Ghoul S., Guedhami O., Schröder H. Institutional investment horizons and firm valuation around the world. *Journal of International Business Studies.* 2021. №52. С. 212-244. DOI: 10.1057/s41267-020-00351-9.
14. Engle R. F. Autoregressive conditional heteroskedasticity with estimates of the variance of United Kingdom inflation. *Econometrica*. 1982. №50(4). С. 987-1008. DOI: https://doi.org/10.2307/1912773.
15. Gupta H., Chaudhary R. An empirical study of volatility in the cryptocurrency market. *Journal of Risk and Financial Management*. 2022. №15(11). С. 1-15. DOI: https://doi.org/10.3390/jrfm15110513.
16. Jeong Y.-C., Yu J., Ryu W. Connecting Cross-Border Market Participants: The Intermediary Role of International Analysts in Global Capital Markets. *Journal of Management Studies*. 2024. №61(6). С. 2535-2569. DOI: https://doi.org/10.1111/joms.12988.
17. Lee C.-C., Lee C.-C. International spillovers of U.S. monetary uncertainty and equity market volatility to China's stock markets. *Journal of Asian Economics*. 2023. №84. 101575. DOI: https://doi.org/10.1016/j.asieco.2022.101575.
18. Rohilla A., Tripathi N. A study on investors' sentiment and market returns of the Indian stock market. In (M. K. Mohanty, Ed.). *Orissa Journal of Commerce*. 2022. №43(4). 11 с. DOI: https://doi.org/10.54063/ojc.2022.v43i04.02.
19. Roy G., Fiaidhi J., Mohammed S. Multi-Timeframe Algorithmic Trading Bots Using Thick Data Heuristics with Deep Reinforcement Learning. *Artificial Intelligence Evolution.* 2022. №3(2). С. 107–159. DOI: https://doi.org/10.37256/aie.3220221722.
20. Salisu A.A., Lasisi L., Tchankam J.P. Historical geopolitical risk and the behaviour of stock returns in advanced economies. *The European Journal of Finance*. 2022. №28(9). С. 889-906. DOI: https://doi.org/10.1080/1351847X.2021.1968467.
21. Twedt B., Rees L. Reading between the lines: an empirical examination of qualitative attributes of financial analysts' reports. *Journal of Accounting and Public Policy.* 2012. №31. С. 1-21. DOI: https://doi.org/10.1016/j.jaccpubpol.2011.10.010.
22. Umar Z., Bossman A., Choi S.-Y., Teplova T. Does geopolitical risk matter for global asset returns? Evidence from quantile-on-quantile regression. *Finance Research Letters.* 2022. №48. 102991. DOI: https://doi.org/10.1016/j.frl.2022.102991.
23. Wang B., Xiao Y. Risk spillovers from China's and the US stock markets during high-volatility periods: Evidence from East Asianstock markets. *International Review of Financial Analysis*. 2023. №86. 102538. DOI: https://doi.org/10.1016/j.irfa.2023.102538.
24. Global Cybersecurity Outlook 2024. *World Economic Forum*. URL: https://www.weforum.org/publications/global-cybersecurity-outlook-2024/
25. Yilmazkuday H. COVID-19 effects on the S&P 500 index. *Applied Economics Letters*. 2023. №30(1). С. 7–13. DOI: https://doi.org/10.1080/13504851.2021.1971607.
26. Yilmazkuday, H. Geopolitical risk and stock prices. *European Journal of Political Economy*. 2024. №83. 102553. DOI: https://doi.org/10.1016/j.ejpoleco.2024.102553.

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# Investment activities of non-bank financial institutions: current and future development trajectory

***Abstract.*** In light of Ukraine's significant financial needs for recovery, the investment flows from the traditional banking system are insufficient. Non-bank financial institutions (NBFIs) are becoming critically important for mobilizing long-term capital and specialized financing, transforming into essential pillars of the national reconstruction strategy.

**Problem statement.** NBFIs, with their diverse structures, have the potential for specialized financing. Their ability to accumulate long-term capital is crucial for rebuilding the national economy.

**Unresolved aspects of the problem.** It has been established that NBFIs account for 20% of Ukraine's financial assets but face risks from the state of war, low trust, limited access to long-term financing, and regulatory gaps.

**Purpose of the article.** The purpose of this article is to investigate the current and future development trajectory of NBFI investment activities in Ukraine and to formulate strategic recommendations for enhancing their contribution to economic recovery.

**Presentation of the main material.** To achieve this goal, analytical, systemic, and comparative approaches were used to assess current challenges, analyze legislative harmonization with the EU, optimize risks, and implement innovative financial instruments. It has been established that NBFIs account for 20% of Ukraine's financial assets but face risks from the state of war, low trust, limited access to long-term financing, and regulatory gaps. The study revealed that harmonization with EU legislation (MiFID II, Solvency II, IORP II, AMLD), optimization of investment portfolios considering dynamic risks (including ESG factors), and the introduction of innovative financial instruments (crowdfunding, green bonds, tokenization) and FinTech solutions are key determinants of their development.

**Conclusions.** The practical significance of the obtained results lies in the fact that the proposed recommendations will contribute to strengthening Ukraine's financial system, attracting international capital, increasing investor confidence, and ensuring sustainable economic recovery through the expansion of NBFI investment activities. The article substantiates the role of NBFIs as key drivers of Ukraine's post-war recovery and European integration, providing a comprehensive analysis of the interplay between regulatory, risk, and innovative aspects of their investment activities amid unprecedented challenges. Further research should focus on developing a nationwide strategy for the NBFI sector, including product diversification, prioritizing digital transformation, fostering strategic partnerships, investing in human capital, focusing on sustainable sectors, and blended finance mechanisms.

***Keywords****: non-bank financial institutions, investment activity, economic recovery, European integration, risk management, ESG, crowdfunding, FinTech*

**Formulas**: 0; fig.: 1, tabl.: 3, bibl.: 27

**JEL Classification:** G23; G28 E22

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**Introduction**. Given the unprecedented scale of financial needs for the recovery of the national economy – estimated at USD 486 billion [1] – reliance solely on the traditional banking system, which itself faces considerable challenges in the context of a wartime economy, is insufficient. Non-bank financial institutions (NBFIs), with their diverse structures such as insurance companies, pension funds, and credit unions, possess significant potential for specialised financing. Their capacity to accumulate long-term capital (for example, from pension funds) and to serve underbanked segments (for instance, through credit unions) is crucial. This situation elevates the role of NBFIs from being merely "alternative" or auxiliary financial providers to becoming "essential pillars" of the national economic recovery strategy. Their stable development and integration are not merely beneficial, but critically important for unlocking diverse sources of funding and ensuring a comprehensive approach to reconstruction. Therefore, policies and investment strategies should prioritise strengthening the capacity of NBFIs in order to maximise their contribution.

**Literature Review**. In recent years, both regulators and the international and domestic academic communities have paid considerable attention to the development of the non-bank financial institutions (NBFI) sector.

Turning to the work of foreign scholars, particular attention should be given to the study by S. Aramonte and co-authors [2], who demonstrated that the growth of NBFIs is associated with low asset price volatility. Low interest rates fuelled the search for yield, which positioned NBFIs as attractive alternatives to traditional players in the financial market. Specifically, investors reinvested their capital gains and redirected new funds into the sector – mainly into firms investing in corporate and other securities offering promises of high returns.

Globally, the expansion of NBFIs reflects a contraction in banking institutions and comparatively stricter banking regulation. While certain securities market reforms have generally tightened controls more for banks than for NBFIs (for instance, market-making has become less viable), further financial liberalisation and globalisation have enabled investors to conduct transactions more freely and allowed intermediaries to operate more easily both domestically and internationally – thus fuelling the growth of NBFIs. Increased demand for collateral – partly driven by the official desire to move derivatives trading onto organised exchanges, as well as the emergence of safer forms of (interbank) trading – has further stimulated demand for claims issued by NBFIs [3].

A substantial cohort of researchers has focused on identifying the risks faced by NBFIs and improving regulatory frameworks for their operations, including leverage, liquidity, procyclicality, and capital requirements. Notable contributions in this field include those by S. Claessens [4], P. Bednarek and colleagues [5], and S. Aramonte and co-authors [6].

The modern concept of sustainable development has permeated the global financial landscape. Consequently, the research of Eduardo C. Garrido-Merchán and co-authors [7], and B. Lannone and colleagues [8], has centred on green investing and approaches to constructing ESG portfolios within NBFIs.

The Ukrainian academic community has likewise been actively engaged in research on the investment activities of NBFIs. Significant domestic contributions include the works of H. Faraponov [9] and H. Buha [10], who have explored regulatory support and the security-related functions of NBFIs. Research on investment strategy development and ESG portfolio formation within Ukrainian NBFIs includes studies by S. Bessonova [11], Yu. Derevko [12], S. Kropelnytska and colleagues [13], M. Zhyttar [14].

Based on the analysis of the current state of investment activity among NBFIs in Ukraine, several unresolved issues can be identified that hinder the full realisation of their potential and warrant further research: - risks associated with martial law; - low public trust in the NBFI sector; - limited access to long-term financing by domestic NBFIs; - regulatory gaps; - insufficient

adaptation to dynamic risks; - underutilisation of innovative financial instruments and digital transformation.

**Purpose, objectives and research methods**. The purpose of this study is to conduct a comprehensive analysis of the current investment activities of non-bank financial institutions (NBFIs) in Ukraine, to identify the key determinants of their development, and to formulate strategic recommendations for ensuring their future growth trajectory in the context of post-war recovery and European integration.

To achieve this aim, the following objectives must be addressed:

- to analyse the impact of European integration processes on the investment activities of NBFIs in Ukraine, including the harmonisation of legislation and facilitation of access to European financial markets;
- to explore the optimisation of NBFI investment portfolios under dynamic risk conditions, including the development of quantitative models for managing wartime and post-war risks, as well as the integration of ESG criteria;
- to assess the potential of innovative financial instruments (such as crowdfunding platforms, green bonds, and tokenised assets) for attracting investment under conditions of limited access to traditional sources of finance;
- to determine the impact of digital transformation and fintech solutions on the operational models and investment opportunities of NBFIs;
- to formulate strategic policy and regulatory recommendations, as well as investment strategy proposals, aimed at strengthening the role of NBFIs in Ukraine's reconstruction and sustainable development.

To accomplish these goals, an in-depth analysis was carried out on the factors influencing the development of the domestic NBFI sector, with a focus on those areas that affect the investment process. A systems-based approach was applied to consider NBFI investment activity in a comprehensive manner, including its interrelations with the macroeconomic environment and European integration processes. Methods of generalisation and systematisation were used to synthesise the scientific contributions of domestic and foreign researchers, as well as to present information in tabular format. Statistical methods were employed to assess trends in the dynamics of assets and the number of NBFIs and banks. Methods of analysis and synthesis were used to identify problems, determine development determinants, and formulate recommendations.

**Research results**. Non-bank financial institutions (NBFIs) play a significant role in Ukraine's financial system, accounting for approximately 20% of the country's total financial assets. This share highlights both their current importance and their potential for further growth within the broader financial landscape.

However, Ukrainian NBFIs face a range of serious challenges that currently hinder the realisation of their full potential. These include:

**Risks associated with martial law**. Direct consequences such as asset destruction, supply chain disruptions, high inflation, and capital outflows significantly affect operational stability and the investment climate. These factors create an unprecedented level of uncertainty for investment decision-making [13, p. 257; 15].

Low public trust. This long-standing issue within the Ukrainian financial sector has been exacerbated by ongoing instability, limiting the mobilisation of domestic capital [11, p. 62].

Limited access to long-term financing. This poses a critical barrier for NBFIs, preventing them from undertaking large-scale, strategic investments essential for reconstruction.

Regulatory gaps. Inconsistencies or underdeveloped legal and regulatory frameworks impede sector growth and its alignment with international standards [9; 13].

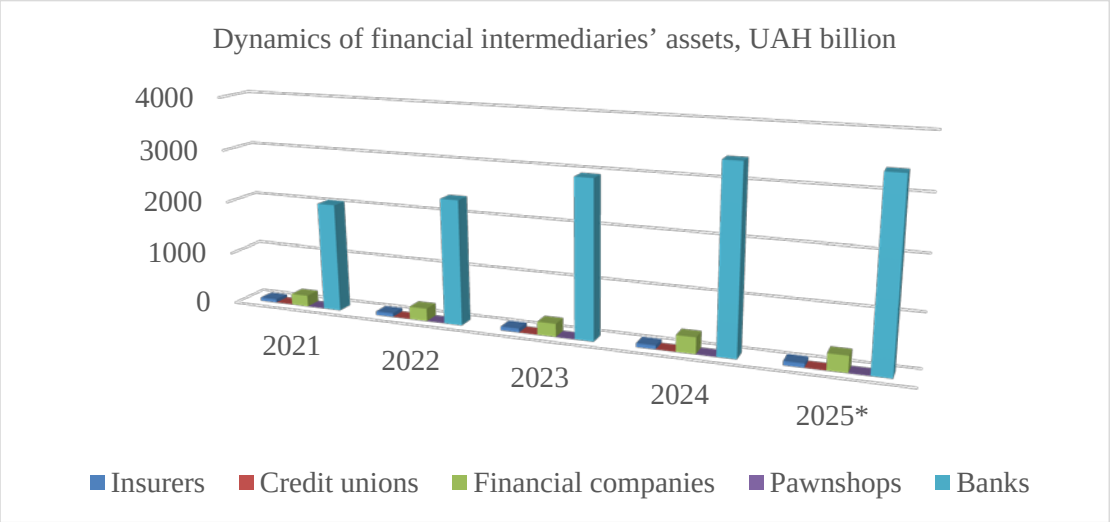
An analysis of NBFIs by asset size and number, as regulated by the National Bank of Ukraine (Figure 1), reveals that banks remain the dominant players in the financial services market, despite their gradual exit from the sector.

It is worth noting that the total volume of NBFI assets in Q1 2025 increased by 4.6% year-on-year. This growth reflects the overall resilience of the sector, despite the ongoing challenges associated with martial law in Ukraine. The share of NBFI assets under the supervision of the National Bank of Ukraine (NBU) in the total financial sector reached 10.3% in Q1 2025. The rising proportion of NBFI assets within the financial sector highlights their growing role and influence, which, in turn, underscores the need for more rigorous regulatory oversight to safeguard financial stability.

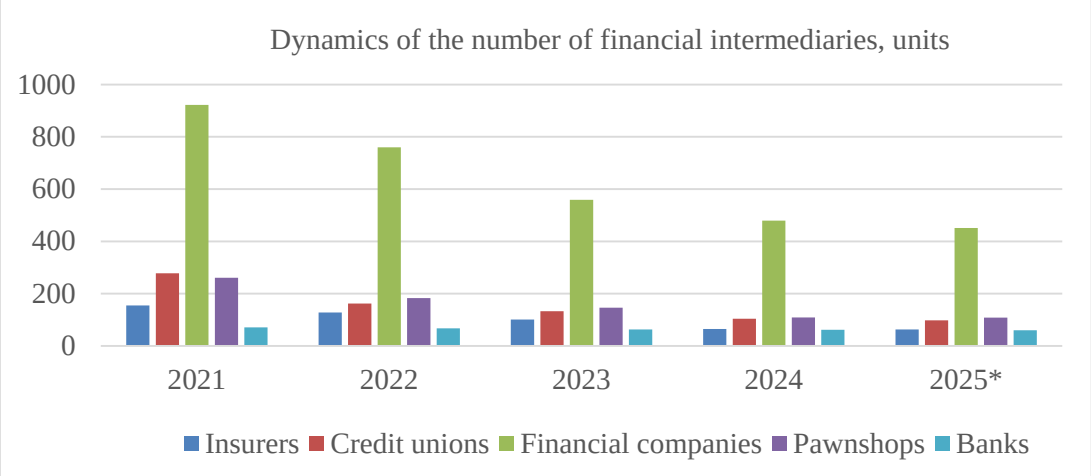
Based on the objectives outlined in this research, the following section considers the key determinants for further improving the investment activity of NBFIs.

Firstly, there is the issue of assessing the impact of European integration on the investment activity of NBFIs. For Ukraine, aligning its financial legislation with key EU directives is imperative as part of the accession process. This harmonisation is a fundamental prerequisite for deeper economic integration. In particular, it involves the adoption of the following EU directives [17; 18]:

- MiFID II (Markets in Financial Instruments Directive). This directive focuses on investor protection, market transparency, and fair-trading practices. Its implementation will require significant improvements in operational transparency and client protection measures for Ukrainian NBFIs [https://surl.li/mqmigi].




**2025 – Q1 2025*




*2025 – Q1 2025

*Figure 1 – Dynamics of assets and number of NFIs and banks for 2021-2025*
*Source: compiled by the author based on [13]*

- Solvency II (Capital Requirements for Insurance Companies). This directive sets out stringent requirements for capital adequacy and risk management for insurers, which make up a substantial part of Ukraine's non-bank financial sector. Its adoption will enhance the financial stability of insurance companies [https://surl.lt/flnqmd].
- IORP II (Institutions for Occupational Retirement Provision). This directive addresses the governance and risk management of pension funds, which is critically important for the long-term stability and growth of Ukraine's pension system [https://surli.cc/umhwgo].

The National Bank of Ukraine is playing a proactive role in implementing reforms, including the adoption of risk-based supervision, the improvement of corporate governance, and the strengthening of consumer protection. These reforms are essential preparatory steps that lay the groundwork for effective EU integration.

It should also be emphasised that legal harmonisation directly facilitates broader access for Ukrainian NBFIs to European financial markets. This includes attracting both direct foreign investment and portfolio investment from EU institutions and investors. Enhanced regulatory predictability and transparency substantially reduce perceived risks for international investors, thereby making Ukrainian NBFIs more attractive compared to those operating in less regulated environments. Such expanded access could directly address the current challenge of limited long-term financing for NBFIs in Ukraine, providing much-needed capital for long-term development and national economic recovery projects.

The adoption of stringent EU standards – such as MiFID II, aimed at investor protection and market transparency, and Solvency II, which sets robust capital requirements in the insurance sector – inevitably compels Ukrainian NBFIs to professionalise their operations, governance structures, and risk management practices. This enforced professionalisation and enhanced transparency directly address the issue of low public trust, by demonstrating adherence to internationally recognised best practices, thereby strengthening confidence among both domestic and international investors.

Moreover, the National Bank of Ukraine's proactive reforms are not isolated measures – they serve as a foundational framework for creating a more reliable domestic regulatory environment. This, in turn, facilitates smoother and more effective EU integration, particularly in terms of attracting and retaining foreign capital. It signals a clear commitment to a stable and predictable financial ecosystem.

Thus, harmonisation with the EU should not be viewed merely as a regulatory burden – it is a strategic instrument for systemic strengthening and a powerful indication of Ukraine's dedication to market integrity and investor protection. This commitment is essential for unlocking the capital required for long-term recovery and development, as it directly reduces perceived governance and transparency risks that often deter foreign investors in emerging markets. Ultimately, it transforms Ukraine's NBFI sector into a more reliable and attractive destination for global capital.

The key characteristics of the harmonisation of national legislation with EU requirements are presented in Table 1.

Secondly, the optimisation of NBFI investment portfolios in an environment of dynamic risks is a pressing issue. There is currently a critical need for advanced quantitative models capable of managing the unique and highly volatile risks facing NBFIs. Traditional risk assessment models often prove inadequate under such extreme uncertainty. These models must integrate specific risks associated with martial law [12; 13; 15; 19], namely:

- *Asset destruction* – direct physical damage to assets and infrastructure, affecting collateral value and the viability of investments.
- *Supply chain disruptions* – impacting business operations and contributing to a rise in non-performing loans (NPLs).
- *High inflation* – eroding purchasing power and the real value of investments and returns.

– *Capital outflows* – reducing liquidity and investment capacity in the domestic market.
– *Rising NPLs* – a direct consequence of economic shocks and bankruptcies among economic actors.

*Table 1. Key stages and gaps in Ukraine's legislative harmonization with EU directives*

| EU Directive / Regulation | Key Provisions / Requirements | Current Status of Ukrainian Legislation | Direct Impact on Ukrainian NBFIs | Opportunities / Challenges |
|---|---|---|---|---|
| MiFID II (Markets in Financial Instruments Directive) | Investor protection, market transparency, fair trading practices | Partially adopted / Draft stage | Higher requirements for operational transparency, client protection, and reporting | Opportunity to enhance investor confidence; challenge of high compliance costs |
| Solvency II (Insurance Capital Requirements) | Capital adequacy and risk management requirements for insurers | Partially adopted / Draft stage | Stricter capital and risk management requirements for insurers | Opportunity for improved financial stability; challenge for smaller market players |
| IORP II (Institutions for Occupational Retirement Provision) | Governance and risk management for pension funds | Under review | Enhanced governance and risk management standards for pension funds | Opportunity for long-term pension system stability; challenge of adaptation |
| AMLD (Anti-Money Laundering Directive) | Prevention of money laundering and terrorist financing | Largely adopted | Strengthened control and reporting over financial operations | Opportunity to boost international trust; challenge of increased operational costs |

*Source: compiled by the author based on [9, p. 204; 17; 18]*

In addition, the post-war period is marked by persistent challenges requiring continuous risk assessment, such as slow economic recovery, potential political instability, and the outflow of human capital. These long-term structural risks call for adaptive and flexible investment strategies. The development of robust stress-testing scenarios that explicitly incorporate geopolitical and macroeconomic variables is essential. This includes scenario analysis for varying durations and intensities of conflict, different recovery trajectories, and their effects on asset classes, liquidity, and solvency [20].

Alongside this, it is important to highlight the growing global importance of environmental, social, and governance (ESG) factors in investment decisions. This shift is driven by investor demand, regulatory pressure, and a growing recognition of the need to generate long-term value. For Ukraine, ESG integration is not merely a global trend or compliance exercise – it is a strategic imperative for attracting international finance for reconstruction. A significant number of international donors, development finance institutions, and impact-oriented investors prioritise ESG alignment and sustainable investing [21; 22].

The adoption of ESG criteria can enhance the resilience of NBFIs, improve their public image, and align them with European values and international best practices. This, in turn, facilitates access to a broader and more patient pool of sustainable and responsible capital. Specific ESG considerations that are especially relevant to Ukraine’s context include investment in green recovery initiatives (e.g., renewable energy, sustainable infrastructure), support for social housing and healthcare projects, and the establishment of transparent and accountable governance structures for all post-war investments.

It should also be emphasised that the scale of Ukraine’s reconstruction requires long-term, impact-oriented investment – capital that is less sensitive to immediate market volatility and more focused on sustainable development. Traditional financial investors may respond negatively to high wartime and post-war risk. However, a significant and growing portion of global capital –

particularly from development finance institutions, sovereign wealth funds, and major asset managers – is increasingly mandated to invest in accordance with strong ESG principles.

By rigorously integrating ESG into their investment frameworks, Ukrainian NBFIs can signal alignment with international development goals, responsible governance, and environmental sustainability. This directly addresses the issue of limited access to long-term finance by attracting a specific, substantial, and expanding pool of capital that prioritises impact alongside financial returns.

Thus, ESG becomes a strategic differentiator and a key enabler in attracting precisely the type of capital – long-term, sustainable, impact-driven – best suited to financing large-scale, complex reconstruction projects. It transforms ESG from a mere compliance obligation into a powerful competitive advantage, positioning Ukrainian NBFIs as responsible, resilient, and attractive partners in global recovery efforts, thereby accelerating national renewal and sustainable development (Table 2).

*Table 2. Quantitative risk factors and mitigation strategies for NFI portfolios (war/post-war scenarios)*

| Risk Category | Specific Risk Factor | Quantitative Impact Indicator | Mitigation Strategies for NBFIs | Relevant ESG Criteria |
|---|---|---|---|---|
| Geopolitical | Asset destruction | Percentage loss of asset value | Geographic/sectoral diversification, insurance mechanisms | Social impact assessment, investment resilience to external shocks |
| Macroeconomic | High inflation | Impact of inflation rate on real returns | Hedging strategies, investment in inflation-protected assets | Governance transparency, economic resilience of projects |
| Microeconomic | Capital outflow | Currency devaluation, reduced liquidity | Attraction of foreign investment, stimulation of domestic savings | Social responsibility, support for the local economy |
| Credit | Increase in NPLs | Non-performing loan (NPL) ratio | Scenario analysis and stress testing, enhanced credit scoring | Corporate governance, responsible lending |
| Operational | Supply chain disruption | Reduced operating profit, project delays | Contingency planning, supplier diversification | Environmental sustainability of supply chains, labour standards |
| Social | Human capital outflow | Shortage of skilled labour | Talent retention programmes, investment in education | Social impact on communities, fair working conditions |
| Political | Political instability | Impact on GDP, regulatory uncertainty | Portfolio diversification, advocacy for a stable regulatory environment | Governance transparency, anti-corruption measures |

*Source: compiled by the author based on [4, p.279; 13, p. 260; 14, p. 35; 19; 22]*

Thirdly, the use of innovative financial instruments and digital transformation is of increasing importance. One such innovative instrument that NBFIs can utilise to attract investment is the potential of crowdfunding platforms.

Crowdfunding platforms play a significant role in mobilising smaller, often decentralised investments – particularly for small and medium-sized enterprises (SMEs) and start-ups. These entities are critical for rebuilding the economy at the grassroots level, generating employment, and

fostering innovation. Crowdfunding can effectively bypass traditional financing barriers, especially for businesses with limited collateral, no established credit history, or those located in regions underserved by conventional banks. This directly addresses the issue of limited access to traditional sources of financing for NBFIs and their prospective investees [23, p. 67; 24, p. 83].

Beyond crowdfunding, there are several other innovative financial instruments relevant to NBFIs for broader capital mobilisation:

- Green bonds – used to finance environmentally sustainable reconstruction projects (e.g. renewable energy, green infrastructure) [21, p. 42; 25].
- Social impact bonds – designed to fund social infrastructure projects (e.g. healthcare, education, housing) with clearly measurable social outcomes.
- Tokenised assets – leveraging blockchain technology to enable fractional ownership and improve liquidity in real estate or infrastructure projects, potentially attracting a wider base of investors, including members of the diaspora [23, p. 68].

Therefore, it can be concluded that NBFIs have the potential to act as intermediaries, facilitators, or even direct participants in these platforms and instruments. By doing so, they can expand their investment capabilities, diversify their portfolios, and extend their market reach.

Regarding digital transformation and the adoption of advanced fintech solutions (such as artificial intelligence, blockchain, and big data analytics), these developments have the potential to fundamentally reshape the operational models of NBFIs. They offer a wide range of benefits, including:

- enhanced efficiency through process optimisation, reduced human error, and faster transaction speeds;
- cost reduction via automation and the use of digital channels, which significantly lower overheads;
- improved data analytics enabling deeper insights into credit risk, fraud detection, and market trends;
- the ability to design highly personalised and flexible financial products and services [26-27].

Clear examples of fintech applications in NBFI investment activities include: - AI-driven credit scoring for micro-enterprises; - blockchain for transparent and immutable record-keeping in insurance claims and pension management; - mobile payment solutions that enhance financial inclusion [23; 27].

In a country undergoing reconstruction, the traditional financial infrastructure – such as physical bank branches, secure data centres, and extensive ATM networks – may be damaged, underdeveloped, or costly to rebuild. Conventional financial models often rely heavily on this physical presence.

In contrast, digitalisation, through mobile-first strategies, cloud computing, and decentralised ledger technologies (e.g. blockchain), allows NBFIs to overcome such physical constraints. By greatly reducing the need for physical infrastructure and automating core processes, fintech significantly lowers the cost of servicing remote or underserved populations. This directly addresses the issue of limited access to traditional sources of finance, by creating new, accessible, and cost-effective channels both for investors (e.g. diaspora communities via crowdfunding) and for recipients (e.g. SMEs in war-affected regions).

Thus, digital transformation is not merely a set of incremental operational improvements for NBFIs – it represents a fundamental shift that can democratise finance across Ukraine. It enables the development of a more resilient, inclusive, and adaptable financial ecosystem, less vulnerable to physical disruption and more capable of mobilising capital from a diverse range of sources, including individuals, the diaspora, and international retail investors. This is crucial for bottom-up reconstruction and for fostering broad-based economic participation [23; 26-27] (Table 3).

*Table 3. Overview of crowdfunding models and innovative financial instruments applicable to Ukrainian NFIs*

| Type of Instrument / Platform | Description / Mechanism | Potential Application for Ukrainian NBFIs | Advantages for Ukraine | Challenges / Risks |
|---|---|---|---|---|
| Equity Crowdfunding | Investment in start-ups / SMEs in exchange for ownership equity | Financing SME recovery and innovative projects | Democratised access to finance, diversified funding sources | Regulatory transparency, investor protection |
| Debt Crowdfunding / P2P Lending | Providing loans to individuals / businesses via online platforms | Providing working capital for businesses, SME financing | Rapid capital mobilisation, reaching underserved segments | Default risks, scalability |
| Social Impact Bonds | Financing social projects with measurable outcomes | Supporting healthcare, education, and social housing projects | Addressing social challenges, attracting catalytic capital | Complexity in measuring impact, need for partnerships |
| Green Bonds | Financing projects with positive environmental impact | Financing renewable energy and sustainable infrastructure projects | Alignment with ESG goals, attracting "green" capital | Need for project verification, market liquidity |
| Real Estate Tokenisation | Representing property shares through digital tokens | Facilitating property development, attracting investment from the diaspora | Enhanced liquidity, broader investor base | Regulatory uncertainty, cybersecurity risks |
| Supply Chain Finance Platforms | Providing financing to suppliers based on accounts receivable | Supporting business continuity, reducing risks for SMEs | Improved cash flows, reduced buyer risk | Operational risks, reliance on technology |

*Source: compiled by the author based on [7-8; 12, p. 50;21-25]*

**Discussion**. Based on the research conducted, it can be concluded that current trends in the investment activity of Ukrainian non-bank financial institutions (NBFIs) are shaped by the resolution of several key challenges: the alignment of domestic legislation with EU regulatory requirements; the identification and selection of models for optimising NBFI investment portfolios under dynamic risk conditions; and the adoption of best practices in implementing digital financial instruments within NBFI operations.

The comprehensive analysis – covering the influence of European integration, risk management, and innovative financial tools – provides a foundation for formulating the following strategic recommendations for various stakeholders.

Drawing on the studies of S. Claessens [4], P. Bednarek and colleagues [5], S. Aramonte et al. [6], H. Faraponov [9], H. Buha [10], O. Zamkovyi and T. Kotenko [27], the following policy and regulatory recommendations are proposed:

- prioritising the full adoption and robust implementation of key EU financial directives (MiFID II, Solvency II, IORP II, AMLD) to enhance transparency, strengthen investor confidence, and facilitate seamless integration with EU financial markets;
- investing in the supervisory capabilities of the National Bank of Ukraine (NBU), particularly in risk-based supervision, oversight of corporate governance, and regulation of digital finance in the NBFI sector;
- establishing a supportive yet prudential regulatory *sandbox* and clear legal frameworks for emerging financial instruments (such as crowdfunding and tokenised assets), to encourage innovation while safeguarding investor protection and market integrity.

At present, one of the most prominent directions in NBFI investment activity is green investing. The scholarly contributions of Eduardo C. Garrido-Merchán and colleagues [7], B. Lannone et al. [8], D. Diakovskyi [21], and N. Prykaziuk [22] provide well-substantiated approaches to the formation of ESG-aligned investment portfolios within the NBFI sector.

**Summarising the academic evidence**, it is considered appropriate, in the Ukrainian context, to introduce targeted incentives (such as tax benefits or priority access to state reconstruction funds) for NBFIs that rigorously implement and report according to ESG criteria. This would align national practice with international sustainable finance trends and attract catalytic capital. Integrating ESG principles into all recovery-related investments should aim to preserve the prioritisation of projects that promote sustainable development, social equity, and resilient infrastructure.

In this context, attention should be given to the economic-mathematical model developed by M. Zhytar [14, p. 39], which facilitates the integration of ESG factors into company business models. This model enables the evaluation of ESG portfolio performance and could serve as a foundation for developing an NBFI's investment strategy [14, p. 39].

An analysis of the experiences of Central and Eastern European (CEE) countries – such as Poland, the Czech Republic, and Romania – which underwent similar post-Soviet transformations and EU accession processes, provides highly relevant historical precedents.

There are direct and actionable parallels between the CEE experience and the current situation in Ukraine, offering valuable lessons that can be transformed into forward-looking strategies. Of particular importance is the phased and well-regulated liberalisation of the market, which ensures robust regulatory oversight and prevents the recurrence of asset quality issues and governance gaps observed in some CEE countries.

Ukrainian NBFIs must proactively diversify their offerings and aggressively pursue digital transformation, learning from the successful technological integration strategies of their CEE counterparts. Additionally, policy should advocate for a level playing field between NBFIs and banks, encouraging healthy competition while ensuring financial stability and consumer protection. This includes the development of tailored regulatory frameworks that support the growth of NBFIs without compromising prudential standards.

At present, active discussions are ongoing regarding the future development trends of the NBFI sector, particularly in relation to risk management systems. In this context, the proposals of S. Kropelnytska and colleagues [13], as well as L. Borysova [15], are especially pertinent. They emphasise the need to design and integrate sophisticated quantitative risk models that incorporate geopolitical, macroeconomic, and social risks – risks that are specific to wartime and post-war scenarios. Such models enable dynamic investment portfolio optimisation and enhance the overall resilience of NBFIs.

The main directions for the further transformation of NBFI investment activity can be outlined as follows:

- Vector One – Encouraging product diversification. Promote the development of a broader range of NBFI products and services tailored to Ukraine's post-war needs, such as specialised microfinance for SMEs, long-term pension products, and innovative insurance solutions for reconstruction-related risks.
- Vector Two – Prioritising digital transformation. Encourage significant investment in fintech solutions and digital infrastructure to boost operational efficiency, reduce costs, improve risk management, and expand access to financial services for underserved populations.
- Vector Three – Promoting strategic partnerships. Support collaboration between traditional NBFIs, agile fintech firms, and international development organisations to leverage expertise, technology, and capital for large-scale investment projects.

– Vector Four – Investing in human capital. Develop targeted training and education programmes within the NBFI sector, focused on advanced risk management, digital finance, ESG integration, and international financial standards.
– Vector Five – Focusing on resilient and high-growth sectors. Direct NBFI investments towards sectors with inherent resilience and high growth potential in the Ukrainian context, such as renewable energy, information technology, agri-food processing, and critical infrastructure.
– Vector Six – Exploring blended finance mechanisms. Encourage and engage in blended finance structures that combine public, private, and philanthropic capital to de-risk investments and mobilise larger pools of funding for critical reconstruction projects.

The outlined challenges in the development of investment activity among domestic NBFIs form a foundation for further research and the shaping of a comprehensive national strategy for the future of the NBFI sector in Ukraine.

**Conclusions**. Ukrainian non-bank financial institutions (NBFIs) are not merely participants but key driving forces behind the country's post-war recovery and successful European integration. Their potential for growth, innovation, and positive social impact is immense – provided the sector proactively embraces strategic reforms, technological advancement, and international best practices.

Through alignment with European legislation, the adoption of advanced risk management techniques, the integration of ESG criteria, the use of innovative financial instruments, and the full digitalisation of their operations, NBFIs can significantly enhance their contribution to capital mobilisation and financial stability.

The experience of Central and Eastern European countries offers a valuable roadmap, highlighting the importance of measured liberalisation, product diversification, and technological leadership. If these lessons are internalised and the recommendations implemented, Ukraine's NBFI sector can become an integral part of the country's sustainable and prosperous economic future, delivering essential financing for reconstruction and long-term development.

**References**

1. Center for Economic Strategy (2025). What awaits the economy in 2025 and beyond? *Macroforecasts from economists and the authorities*. Retrieved from: https://ces.org.ua/macroforecasts-2025-2026/.[in Ukrainian].
2. Sirio, Aramonte, Andreas, Schrimpf, Hyun, Song Shin (2021). Non-bank Financial Intermediaries and Financial Stability. *BIS Working Papers*, 972, 50. Retrieved from: https://www.bis.org/publ/work972.pdf.
3. Claudio. Borio, Marc, Farag, Nikola, Tarashev (2020). Post-crisis international financial regulatory reforms: a primer. *BIS Working Papers*, 859, 69. Retrieved from: https://www.bis.org/publ/work859.pdf.
4. Claessens, S. (2024). Nonbank financial intermediation: Stock take of research, policy, and data. *Annual Review of Financial Economics*, 16, 273-294. https://doi.org/10.1146/annurev-financial-082123-105416.
5. Peter, Bednarek, Olga, Briukhova, Steven, Ongena, & Natalja, von Westernhagen (2023). Effects of bank capital requirements on lending by banks and non-bank financial institutions. *Discussion Paper. Deutsche Bundesbank*, 26, 61. Retrieved from: https://www.econstor.eu/bitstream/10419/279547/1/1867597780.pdf.
6. Sirio, Aramonte, Hyun, Song Shin (2023). Non-bank financial intermediaries and financial stability. *Research Handbook of Financial Markets*. Edited by Refet Gürkaynak and Jonathan Wright, 7, 147-170. Retrieved from: https://doi.org/10.4337/9781800375321.
7. Eduardo, C. Garrido-Merch´an, Gabriel, Gonz´alez Piris, & Maria, Coronado Vaca (2023). Bayesian Optimization of ESG Financial Investments. *Portfolio Management (q-fin.PM).* Retrieved from: https://arxiv.org/pdf/2303.01485.
8. Lannone, B., Duttilo, P., Gattone, S. A. (2025). Evaluating the resilience of ESG investments in European markets during turmoil periods. *Statistical Finance (q-fin.ST).* Retrieved from: https://arxiv.org/pdf/2501.03269.
9. Faraponov, G. (2024). The essence and components of state policy in the market of non-bank financial institutions. *Sustainable development of the economy*, 2 (49), 200-206. https://doi.org/10.32782/2308-1988/2024-49-31. [in Ukrainian].
10. Buga, G. S. (2022). Ensuring security in the sphere of activities of non-bank financial institutions in Ukraine: administrative and legal principles: monograph. Odesa: Publishing house "Helvetica" [in Ukrainian].
11. Bessonova, S.I. (2024). Modern aspects of the non-banking financial sector. Scientific works of DonNTU. Series: "Economic", 1 (29), 61-68. DOI: http://doi.org/10.31474/1680-0044-2024-1(29)-61-68. [in Ukrainian].
12. Derevko, Yu. (2024). Peculiarities of financial instruments of non-banking institutions in Ukraine. *Ukrainian Economic Journal*, 5, 49–53. https://doi.org/10.32782/2786-8273/2024-5-9 [in Ukrainian].
13. Kropelnytska, S.O., Krykhovetska, Z.M., Matskiv, V.V., & Plets, I.I. (2024). Problematic aspects of risk management of investment and infrastructure projects for the restoration of Ukraine. *Current problems of economic development of the region*, 19, 1, 254-263. https://doi.org/10.15330/apred.1.19.254-263. [in Ukrainian]

14. Zhytar, M. (2025). Global trends and challenges of implementing ESG standards in companies' financial strategies: integration, adaptation and effectiveness assessment. *Financial and credit systems: development prospects*, 1 (16), 43-55. https://doi.org/10.26565/2786-4995-2025-1-03. [in Ukrainian]
15. Borisova, L. E., Volkova, M. S. (2024). Banking risk management under martial law in Ukraine. *Economy and Society*, 67. https://doi.org/10.32782/2524-0072/2024-67-113. [in Ukrainian]
16. National Bank of Ukraine (2025). *Non-bank financial sector overview*. Retrieved from: https://surl.li/ffymix. [in Ukrainian]
17. Dorohan, O. (2024). Legal European integration: how Ukrainian legislation adapts to European legislation.BRDO.2024. Retrieved from: https://surl.li/pnzizh. [in Ukrainian]
18. National Bank of Ukraine (2025). As part of the screening, the National Bank presented to the European Commission an assessment of the approximation of national legislation to EU legal acts in the field of financial services. Retrieved from: https://surl.li/mxrozi. [in Ukrainian]
19. Ralph de Haas (2023). The Future of the Financial Sector in Postwar Ukraine. *Economic Truth*. Retrieved from: https://epravda.com.ua/columns/2023/01/05/695722/ [in Ukrainian]
20. National Institute for Strategic Studies (2025). *Review of instruments to support financial stability under martial law in Ukraine* (December 2024 – January 2025). Retrieved from: https://surli.cc/gaucns. [in Ukrainian]
21. Dyakovskyi, D. A. (2024). ESG-investing in the reconstruction of the Ukrainian economy: prospects, advantages and weaknesses. *Scientific notes NaUKMA Economic Sciences*, 9 (1), 40-45. https://doi.org/10.18523/2519-4739.2024.9.1.40-45. [in Ukrainian]
22. Prykazyuk, N.V. (2024). Implementation of ESG principles by non-banking financial institutions: trends and prospects. *Economy and Society*, 64. https://doi.org/10.32782/2524-0072/2024-61-39. [in Ukrainian]
23. Kondrat, O. B., Krykunenko, K. V. (2024) Analysis of innovative financial instruments in modern Ukrainian scientific literature. *Ukrainian Journal of Applied Economics and Technology*, 9, 2, 65-70. https://doi.org/10.36887/2415-8453-2024-2-11. [in Ukrainian]
24. Kyrylyuk, O. V., Yakusheva, N. V., Dzyubenko, L. M., Semenchuk, A. O., Lobanov, O. I. (2025). Participatory models of startup financing in Ukraine. *Finance of Ukraine*, 2, 79-102. https://doi.org/10.33763/finukr2025.02.079. [in Ukrainian]
25. Chaoyu, Zhang (2025). Green bonds and environmental violations in financially constrained environments. *International Review of Economics & Finance*, 103, https://doi.org/10.1016/j.iref.2025.104314.
26. Digital transformation of industrial management in the context of challenges, opportunities and changes: monograph / edited by Dr. Philosophical Sciences, Prof. V. G. Voronkova, Doctor of Economics; Prof. N. G. Metelenko. Lviv Torun: Liha-Press, 2024. [in Ukrainian]
27. Zamkovyi, O. I., Kotenko, T. M. (2022). Fintech transformations and their impact on the sustainability of the development of financial markets and institutions in Ukraine in the ecosystem of corporate culture. *Economy and Society*, 38. https://doi.org/10.32782/2524-0072/2022-38-17 [in Ukrainian]

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**Інвестиційна діяльність небанківських фінансових установ: сучасна та майбутня траєкторія розвитку**

***Анотація.*** В умовах значних фінансових потреб для відновлення України інвестиційні потоки традиційної банківська система є недостатніми. Небанківські фінансові установи (НФУ) стають критично важливими для мобілізації довгострокового капіталу та спеціалізованого фінансування, перетворюючись на необхідні стовпи національної стратегії відбудови.

**Постановка проблеми.** НФУ, з їхніми різноманітними структурами, мають потенціал для спеціалізованого фінансування. Їхня здатність акумулювати довгостроковий капітал є вирішальною для відбудови національної економіки.

**Нерозв'язані аспекти.** НФУ становлять 20% фінансових активів України, але стикаються з ризиками воєнного стану, низькою довірою, обмеженим доступом до довгострокового фінансування та регуляторними прогалинами.

**Мета статті.** Метою даної статті є дослідження сучасної та майбутньої траєкторії розвитку інвестиційної діяльності НФУ в Україні та сформулювати стратегічні рекомендації для посилення їхнього внеску у відновлення економіки.

**Основний матеріал.** Для досягнення поставленої цілі використано аналітичний, системний та порівняльний підходи для оцінки поточних викликів, аналізу гармонізації законодавства з ЄС, оптимізації ризиків та впровадження інноваційних фінансових інструментів. У ході дослідження виявлено, що гармонізація з ЄС (MiFID II, Solvency II, IORP II, AMLD), оптимізація інвестиційних портфелів з урахуванням динамічних ризиків (включаючи ESG-фактори) та впровадження інноваційних фінансових інструментів (краудфандинг, зелені облігації, токенізація) та фінтех-рішень є ключовими детермінантами їхнього розвитку.

**Висновки.** Практична значимість отриманих результатів полягає у тому, що запропоновані рекомендації сприятимуть зміцненню фінансової системи України, залученню міжнародного капіталу, підвищенню довіри інвесторів та забезпеченню сталого економічного відновлення через розширення інвестиційної діяльності НФУ. Обґрунтовано роль НФУ як ключових рушійних сил післявоєнного відновлення та європейської інтеграції України, надано комплексний аналіз взаємозв'язку регуляторних, ризикових та інноваційних аспектів їхньої інвестиційної діяльності в умовах безпрецедентних викликів. Подальші дослідження мають бути зосереджені на розробці загальнонаціональної стратегії розвитку сектору НФУ, включаючи диверсифікацію продуктів, пріоритет цифровій трансформації, сприяння стратегічним партнерствам, інвестиції в людський капітал, орієнтацію на стійкі сектори та механізми змішаного фінансування.

***Ключові слова:*** *небанківські фінансові установи, інвестиційна діяльність, відновлення економіки, європейська інтеграція, управління ризиками, ESG, краудфандинг, фінтех.*

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**Список літератури**

1. Центр економічної стратегії. Що чекає на економіку у 2025 році і далі? Макропрогнози від економістів та влади. Липень, 2025. URL: https://ces.org.ua/macroforecasts-2025-2026/.
2. Sirio Aramonte, Andreas Schrimpf, Hyun Song Shin. Non-bank Financial Intermediaries and Financial Stability. *BIS Working Papers*. 2021. № 972. 50 p. URL: https://www.bis.org/publ/work972.pdf.
3. Claudio Borio, Marc Farag, Nikola Tarashev. Post-crisis international financial regulatory reforms: a primer. *BIS Working Papers*. 2020. № 859. 69 p. URL: https://www.bis.org/publ/work859.pdf.
4. Claessens, S. Nonbank financial intermediation: Stock take of research, policy, and data. *Annual Review of Financial Economics*. 2024. Vol. 16. P. 273-294. DOI: https://doi.org/10.1146/annurev-financial-082123-105416.
5. Peter Bednarek Olga Briukhova, Steven Ongena, Natalja von Westernhagen Effects of bank capital requirements on lending by banks and non-bank financial institutions. *Discussion Paper. Deutsche Bundesbank*. 2023. № 26. 61 p. URL: https://www.econstor.eu/bitstream/10419/279547/1/1867597780.pdf.
6. Sirio Aramonte, Hyun Song Shin. Non-bank financial intermediaries and financial stability. Research Handbook of Financial Markets. Edited by Refet Gürkaynak and Jonathan Wright. 2023. Chapter 7. P. 147-170. DOI: https://doi.org/10.4337/9781800375321.
7. Eduardo C. Garrido-Merch´an, Gabriel Gonz´alez Piris, Maria Coronado Vaca Bayesian Optimization of ESG Financial Investments. Portfolio Management (q-fin.PM). [Submitted on 10 Feb 2023]. URL: https://arxiv.org/pdf/2303.01485.

8. Lannone, B., Duttilo, P., Gattone, S. A. Evaluating the resilience of ESG investments in European markets during turmoil periods. Statistical Finance (q-fin.ST). Submitted on 4 Jan 2025. URL: https://arxiv.org/pdf/2501.03269.
9. Фарапонов, Г. Сутність та складові політики держави на ринку небанківських фінансових установ. *Сталий розвиток економіки*. 2024. № 2 (49). С. 200-206. DOI: https://doi.org/10.32782/2308-1988/2024-49-31.
10. Буга Г. С. Забезпечення безпеки у сфері діяльності небанківських фінансових установ в Україні: адміністративно-правові засади : монографія . Одеса : Видавничий дім «Гельветика», 2022. 404 с.
11. Бессонова С.І. Сучасні аспекти діяльності небанківського фінансового сектору. *Наукові праці ДонНТУ, 2024. Серія: «Економічна».* 2024. № 1 (29). С. 61-68. DOI: http://doi.org/10.31474/1680-0044-2024-1(29)-61-68.
12. Деревко, Ю. Особливості фінансових інструментів небанківських установ в Україні. *Український економічний часопис*. 2024. 5, 49-53. DOI: https://doi.org/10.32782/2786-8273/2024-5-9.
13. Кропельницька С.О., Криховецька З.М., Мацьків В.В., Плець І.І. Проблемні аспекти управління ризиками інвестиційних та інфраструктурних проєктів відновлення України. *Актуальні проблеми розвитку економіки регіону*. 2024. Вип 19. Т. 1. С. 254-263. DOI: https://doi.org/10.15330/apred.1.19.254-263.
14. Житар М. Глобальні тренди та виклики впровадження ESG-стандартів у фінансові стратегії компаній: інтеграція, адаптація та оцінка ефективності. *Фінансово-кредитні системи: перспективи розвитку*. 2025. №1 (16). С. 43-55. DOI: https://doi.org/10.26565/2786-4995-2025-1-03.
15. Борисова Л. Є., Волкова М. С. Управління банківськими ризиками в умовах воєнного стану в Україні. *Економіка та суспільство*. 2024. Вип. 67. DOI: https://doi.org/10.32782/2524-0072/2024-67-113.
16. Національний банк України. Огляд небанківського фінансового сектору. травень 2025 року. URL: https://surl.li/ffymix.
17. Дорогань О. Правова євроінтеграція: як українське законодавство адаптується до європейського. BRDO.2024. URL: https://surl.li/pnzizh.
18. НБУ. Національний банк у межах скринінгу представив Європейській комісії оцінку наближення національного законодавства до актів права ЄС в сфері фінансових послуг. 2025. URL: https://surl.li/mxrozi.
19. Ральф де Хаас. Майбутнє фінансового сектору в післявоєнній Україні. *Економічна правда*. 2023. URL: https://epravda.com.ua/columns/2023/01/05/695722/
20. Національний інститут стратегічних досліджень. Огляд інструментів підтримки фінансової стійкості в умовах воєнного стану в Україні (грудень 2024 р. – січень 2025 р.). URL: https://surli.cc/gaucns.
21. Дяковський Д. А. ESG-інвестування у відбудову економіки України: перспективи, переваги і слабкі сторони. *Наукові записки НаУКМА Економічні науки*. 2024. № 9 (1). С. 40-45. DOI: https://doi.org/10.18523/2519-4739.2024.9.1.40-45.
22. Приказюк Н.В. Впровадження принципів ESG небанківськими фінансовими інститутами:тенденції та перспективи. *Економіка та суспільство*. 2024. Вип. 64. DOI: https://doi.org/10.32782/2524-0072/2024-61-39.
23. Кондрат О. Б., Крикуненко К. В. Аналіз інноваційних фінансових інструментів у сучасній українській науковій літературі. *Український журнал прикладної економіки та техніки*. 2024. Т. 9. № 2. С. 65-70. DOI: https://doi.org/10.36887/2415-8453-2024-2-11.
24. Кирилюк О. В., Якушева Н. В., Дзюбенко Л. М., Семенчук А. О., Лобанов О. І. Партисипативні моделі фінансування стартапів в Україні. *Фінанси України*, 2025. № 2. С. 79-102. DOI: https://doi.org/10.33763/finukr2025.02.079.
25. Chaoyu Zhang Green bonds and environmental violations in financially constrained environments. *International Review of Economics & Finance*. 2025. Vol. 103. 104314. DOI: https://doi.org/10.1016/j.iref.2025.104314.
26. Цифрова трансформація промислового менеджменту у контексті викликів, можливостей та змін : монографія / за ред. д. філософ. н., проф. В. Г. Воронкової, д.е.н.; проф. Н. Г. Метеленко. Львів Торунь : Liha-Pres, 2024. 592 с.
27. Замковий О. І., Котенко Т. М. Fintech трансформації та їх вплив на сталість розвитку фінансових ринків та інститутів в Україні в екосистемі корпоративної культури. *Економіка та суспільство*. 2022. Вип. 38. DOI: https://doi.org/10.32782/2524-0072/2022-38-17
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# Leveraging artificial intelligence for business performance improvement

**Abstract.** The object of research is Artificial Intelligence (AI) as a strategic tool for the transformation of modern business processes. The key characteristics of AI in a business context include its ability to process large datasets, automate operations, optimize resources, and create a personalized customer experience, which collectively impacts a company's performance.

**Problem statement.** In the context of accelerated digitalization, businesses face the fundamental problem of transitioning from a general understanding of AI's potential to its practical integration to achieve measurable financial results. It is necessary to clearly identify and systematize the specific mechanisms through which AI technologies directly affect profitability.

**Unresolved aspects of the problem.** Despite a significant number of studies on specific aspects of AI application, there is a lack of a comprehensive analysis that would systematize its impact. Additionally, insufficient attention has been paid to developing a practical roadmap for AI integration.

**The purpose of the article.** The purpose of the article is to systematize the key mechanisms of Artificial Intelligence's influence on business performance and to develop a structured approach for its strategic implementation to maximize profitability.

**Presentation of the main material.** The study employs a systematic analysis method to structure AI's impact on business through the "dual-engine" model. Tools such as intelligent automation, predictive maintenance, dynamic pricing, and hyper-personalization are examined. Case studies of leading Ukrainian companies have been analyzed.

**Conclusions.** It is established that AI acts as a profitability catalyst, synergistically affecting both the reduction of operational costs and the acceleration of revenue growth. It is substantiated that successful integration requires a clear strategy, a phased approach and cultural adaptation. The absence of an AI strategy in the modern business environment is a conscious choice in favor of losing a competitive advantage.

***Keywords:*** *process optimization, dynamic pricing, personalization, operational efficiency, automation, management.*

Formulas: 0; fig.: 2, tabl.: 2, bibl.: 16.

**JEL Classification. O33, M15, L23, D24.**

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**Introduction.** In the context of the Fourth Industrial Revolution, artificial intelligence (AI) has evolved from a theoretical concept into a fundamental tool that is actively transforming the global business environment. Its key value lies in the ability of systems to analyze vast arrays of data, automate complex processes, and optimize decision-making, making AI not just a technological innovation but a strategic asset that defines the competitiveness of enterprises. The relevance of the research is amplified by the fact that companies integrating neural networks and machine learning technologies demonstrate higher productivity and strengthen their market positions, as confirmed by the experience of both global and leading Ukrainian companies.

Consequently, the problem statement in corporate management has shifted from the question of "whether to implement AI?" to the more pragmatic: "how and in which specific business processes to integrate AI technologies to achieve maximum economic effect?". This necessitates a transition from a general acknowledgment of AI's potential to a systematization of the specific mechanisms through which it impacts the financial performance of an enterprise.

This article focuses on the analysis of these very mechanisms, examining how the technological capabilities of AI are transformed into measurable profitability. The research is based on the concept that artificial intelligence serves as a powerful tool for conserving key resources—time and money—which directly influences the improvement of business performance and provides a foundation for its sustainable development.

**Literature review.** The scientific discourse on the impact of artificial intelligence (AI) on business performance has gained significant intensity in recent years, focusing on the measurable outcomes of its implementation. Contemporary research systematizes the impact of AI along two key vectors, which correlates with the "dual-engine" concept that forms the basis of this article: enhancing operational excellence and stimulating revenue growth.

The first vector is the enhancement of operational excellence through cost reduction. In this area, considerable attention is given to the optimization of logistics and production processes. A systematic review conducted by Asad et al. (2023) confirms that the application of AI in logistics and transportation significantly increases efficiency. This trend is also reflected in Ukrainian scientific thought, where works by authors such as Trushkina (2021) analyze digital transformations in supply chain management based on AI. A particularly significant contribution of AI is in the field of predictive maintenance. As a detailed review of machine learning methods by Carvalho et al. (2021) shows, modern algorithms can predict equipment failures with high accuracy, allowing companies to minimize unplanned downtime and associated financial losses.

The second vector is the creation of customer value and revenue growth. Research in this field concentrates on the transformation of marketing and pricing. In his review of dynamic pricing, den Boer (2023) demonstrates a shift from theoretical models to data-driven approaches where AI enables real-time price adaptation. In marketing, Dwivedi et al. (2021) identify personalization as a key trend enabled by AI. The work of Gupta et al. (2021) complements this view by proposing a taxonomy for AI applications in marketing. Ukrainian scholars are also actively researching this issue; for instance, Prychepa and Kobets (2022) analyze AI as a tool for enhancing the effectiveness of marketing activities.

At the same time, the successful integration of AI extends beyond mere technological implementation. The research by Mikalef and Gupta (2021) introduces the concept of "AI capability," arguing that to achieve a positive impact on business performance, a company must develop not only its technological infrastructure but also its managerial practices and personnel skills. This idea resonates with the work of Ukrainian researchers, such as Krakovetska (2021), who studies the transformation of business processes under conditions of widespread digitalization.

Thus, contemporary scientific literature provides substantial evidence of AI's impact on both levers of profitability. However, despite the in-depth analysis of individual tools, the problem of the synergistic effect of their integrated application remains insufficiently explored. There is a lack of studies that model how enhancing operational stability (through predictive maintenance) creates a

foundation for more effective revenue growth strategies (through dynamic pricing) within a single, integrated system. This study aims to address this gap by analyzing AI as a holistic tool that simultaneously optimizes costs and generates revenue.

**Purpose, objectives and methods of the study.** The purpose of the article is to systematize the key mechanisms of artificial intelligence's influence on business performance and to develop a structured approach to its strategic implementation for maximizing profitability.

To achieve this purpose, the following objectives were set: to examine the theoretical foundations of AI's impact on business processes and to substantiate the conceptual model as a basis for analyzing its effect on profitability; to analyze the mechanisms of AI's influence on reducing operational costs, particularly through intelligent automation, logistics optimization, and predictive maintenance; to investigate AI tools aimed at revenue growth, specifically through the implementation of dynamic pricing and hyper-personalization of the customer experience; to systematize the practical experience of AI implementation by leading Ukrainian companies to identify the most effective strategies and industry-specific features; to develop a practical roadmap for integrating AI into business processes, encompassing both technological and organizational aspects.

The methodological basis of the research comprises the works of domestic and foreign scholars dedicated to the problems of digital transformation and the application of artificial intelligence in economics and management. To solve the set objectives, a complex of general scientific and special research methods was used, including: systemic analysis and synthesis – to structure the impact of AI on business through the "dual-engine" model; comparative analysis – to compare different AI tools and their effectiveness; the case study method – when studying the experience of Ukrainian companies; generalization and the abstract-logical method – for formulating conclusions and developing practical recommendations. The information base consisted of scientific publications, analytical reports from leading consulting agencies, and open company data.

**Research results.** There are two fundamental levers through which any business can increase its profitability: enhancing operational excellence (through cost reduction and process optimization) and creating customer value (through revenue growth and improved customer experience). This "dual-engine" concept will serve as the organizational principle for the subsequent analysis.

The unique strength of artificial intelligence lies in its ability to simultaneously and synergistically influence both of these levers. AI does not merely automate tasks to reduce costs; it also provides tools for deep personalization and enhanced customer interaction, which stimulates revenue growth. This comprehensive impact creates a cumulative effect that significantly enhances the company's financial performance (Fig. 1).

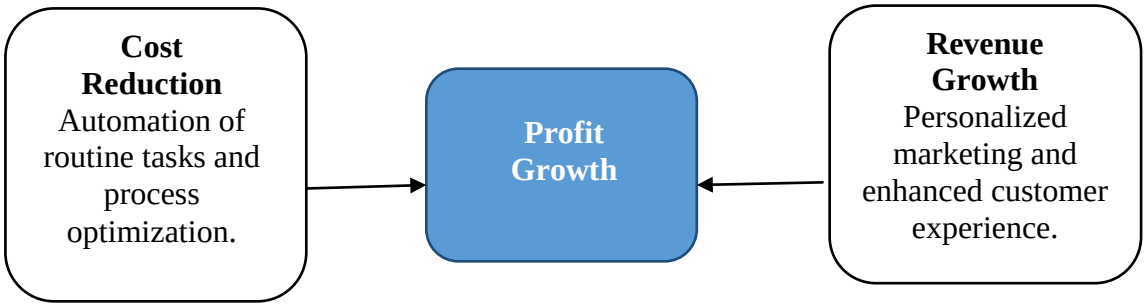


*Fig. 1. Two Key Pathways to Profitability through AI*
*Source: prepared by the authors.*

One of the most tangible and rapid ways AI impacts profitability is through the automation of routine, repetitive, and time-consuming tasks (Pavlovskyi et al., 2023). This enables companies to reallocate human capital toward more complex, creative, and strategic functions of higher value.

In finance and accounting, AI systems automate data entry, invoice processing, fraud detection, and financial statement analysis. For instance, modern tools can analyze a balance sheet and provide specific recommendations for liability management, inventory optimization, and cash flow management. Algorithms are also capable of identifying unusual operations or duplicate transactions, minimizing the risk of errors and financial losses that are easily overlooked during manual review.

In HR and administration, AI is utilized for resume screening, which allows for the rapid assessment of a candidate's relevance and can even recommend alternative vacancies to them. Other tools assist in automatically scheduling tasks, creating internal guidelines, and preparing reports.

The primary advantage of automation lies not merely in the direct cost savings from reduced labor hours. It creates an opportunity for the strategic reorientation of human intellect. When employees are relieved of monotonous work, they can focus on innovation, improving customer relations, and developing new business strategies. These are activities that yield a significantly higher return on investment than data entry. Thus, the initial cost saving represents a linear benefit, whereas the enhanced innovative potential of the redeployed workforce is a secondary, exponential advantage.

Artificial intelligence is transforming logistics. It optimizes the entire supply chain—from the procurement of raw materials to inventory management and "last-mile" delivery.

AI algorithms analyze real-time data on traffic, weather conditions, and delivery schedules to calculate the most efficient routes. This leads to significant reductions in fuel costs and delivery time.

Based on historical sales data, seasonality, and market trends, AI predicts future demand. This helps to avoid excess inventory (which ties up capital) and stockouts (which result in lost sales).

AI-powered robotics automates order picking, packing, and sorting processes, which reduces labor costs and error rates (Horiach & Horiach, 2023).

Digital assistants can automate routine communication, such as order confirmations and delivery status updates, which reduces delays and enhances interaction efficiency.

In capital-intensive industries like manufacturing, energy, and transportation, unplanned equipment downtime leads to colossal financial losses. Predictive maintenance is a strategy whereby AI analyzes equipment data to forecast potential failures before they occur.

Internet of Things (IoT) sensors collect real-time data (temperature, vibration, pressure) from industrial machinery. Machine learning models analyze this data, detect anomalies, and predict the probability of equipment failure. Consequently, maintenance is performed not on a fixed schedule but only when it is genuinely necessary, which optimizes resource utilization.

According to a McKinsey study, this approach can reduce equipment downtime by 30-50% and extend its service life by 20-40%. This not only prevents direct financial losses from production stoppages but also allows for the most effective utilization of expensive assets.

The stability of operational processes, achieved through predictive maintenance, is critically important for realizing the other benefits of AI. As previously noted, the automation of routine tasks frees up employees for strategic work. However, an unplanned equipment failure constitutes a crisis that demands immediate attention, diverting these same strategic employees from their high-value work to "firefighting".

By creating a stable and predictable operational environment, predictive maintenance acts as a foundational layer that ensures the human capital freed by automation can genuinely remain focused on innovation and strategy. This protects and enhances the secondary, exponential advantages of automation.

As a result, the company not only avoids the costs associated with downtime but also achieves the maximum return on its investments in talent and technology. This operational reliability transforms the potential benefits of AI into tangible, measurable financial outcomes, ensuring sustainable growth rather than short-term savings.

Artificial intelligence enables businesses to transcend broad market segments and treat each customer as an individual. This radically enhances engagement, loyalty, and conversion rates.

AI analyzes a customer's browsing history, previous purchases, real-time behavior, and other data to provide personalized recommendations for products, content, and marketing messages. It can even reconfigure a website in real-time for each unique visitor, creating millions of site versions tailored to specific needs.

This strategy has proven to be extraordinarily effective in increasing revenue. A striking example is Nike, which combined predictive analytics, a virtual shoe try-on feature in its mobile application, and intelligent chatbots. This resulted in direct sales growth from $2.9 billion to $12.4 billion. This case demonstrates the immense financial power of an integrated and personalized customer experience.

AI-based dynamic pricing enables companies to adjust prices in real-time based on demand, supply, competitor pricing, and even external factors such as weather or time of day. This transforms pricing from a static 'cost-plus' model into a flexible, data-driven strategy that maximizes the profit from each transaction (Illiashenko & Shypulina, 2023).

This approach is extensively employed in the airline, hospitality, and ride-sharing industries (e.g., Uber), but it is also being increasingly applied in e-commerce. The retail giant Amazon, for instance, changes the prices of its products approximately 2.5 million times a day to optimize profitability.

Dynamic pricing and personalization create a self-reinforcing revenue cycle. When the personalization system identifies a customer with a high intent to purchase a specific product, the dynamic pricing system can test the price elasticity for that customer, potentially offering a slightly higher price than for a regular visitor, thereby maximizing the margin. The customer's response to this price (a purchase or a decline) becomes a new data point that refines both the pricing model and the personalization model. This creates a continuous optimization loop where each transaction makes the entire system more intelligent and profitable.

By accumulating data from each interaction, a business gains a deep, granular understanding of the market, which enables not only the optimization of prices for individual customers but also the forecasting of demand for entire segments. This capacity for self-improvement transforms the conventional sales process into a strategic asset that continuously generates new insights and, over time, builds a formidable competitive advantage that is virtually impossible to replicate.

AI transforms customer support from a reactive cost center into a proactive revenue engine.

Intelligent chatbots provide 24/7 support, handling up to 40% of standard inquiries and reducing operator costs by 25-30%. They do not merely answer questions but can also provide personalized recommendations, assist with order placement, and send abandoned cart reminders, which directly increases sales.

By analyzing user behavior, AI suggests relevant products based on the "customers who bought this also showed interest in..." principle, which stimulates up-selling and cross-selling.

By providing instant, personalized, and useful interactions, AI strengthens customer loyalty and satisfaction, which is the foundation for a high Customer Lifetime Value.

AI can be integrated into specific functional departments of a company for maximum impact (Table 1). For example, it provides marketers and sales departments with tools for unprecedented efficiency and personalization.

Generative AI is utilized for writing blog texts, product descriptions, social media posts, press releases, and even for developing comprehensive PR strategies. This allows for the creation of large volumes of content in a matter of minutes, significantly saving time and resources.

*Table 1. Application of AI and its Impact on Profitability*

| ***Business Function*** | **AI Application / Technology** | **Primary Impact on Cost Reduction** | **Primary Impact on Revenue Growth** |
|---|---|---|---|
| *Marketing* | AI-powered content generation | Reduces content production costs and time | Increases publication speed and audience engagement |
| *Sales* | AI in CRM and lead scoring | Optimizes sales team's time on the most promising leads | Increases conversion rates and average order value |
| *Customer Service* | Intelligent chatbots | Reduces cost per interaction by 25-30% | Increases upselling opportunities and reduces abandoned carts |
| *Operations/Logistics* | Route and inventory optimization | Reduces fuel and warehousing costs | Prevents lost sales due to stockouts |
| *Manufacturing* | Predictive maintenance | Reduces costs from unplanned downtime by 30-50% | Increases production capacity and reliability |
| *Finance* | Dynamic pricing | — | Maximizes profit margin on each transaction |
| | AI-powered fraud detection | Minimizes losses from fraudulent transactions | Enhances customer trust and operational security |

*Source: prepared by the authors.*

Specialized AI tools assist in keyword research, content optimization for search engines, and the analysis of advertising campaign effectiveness to rationally allocate the budget and maximize the return on investment (ROI).

AI analyzes data from CRM systems and user behavior to identify the most promising potential clients (leads) and to precisely segment the audience for conducting highly targeted marketing campaigns.

Customer service is undergoing a transformation. Intelligent chatbots and virtual assistants have become a standard in quality customer service. They have evolved from simple bots that answer frequently asked questions into sophisticated systems capable of understanding conversational context, analyzing customer intent, and providing personalized solutions. A crucial function of chatbots is the collection of data regarding customer inquiries and problems. This information serves as a valuable resource for marketers and product developers, enabling a better understanding of market needs.

In the financial sector, AI provides a new level of analytics and security. AI is utilized for the in-depth analysis of financial data, forecasting market trends, identifying opportunities for growth, and potential risks. This enables management to make more informed and timely decisions.

AI algorithms analyze transactional patterns in real-time, instantly detecting suspicious activity. This is critically important for banks, financial institutions, and e-commerce platforms to prevent financial losses.

AI is also transforming processes within HR departments, making them more efficient and data-driven. As the experience of Ukrainian IT companies demonstrates, AI models can effectively analyze resumes, screen out irrelevant candidates, and identify the best applicants for a position. Some systems are even capable of predicting an employee's future success within the company.

AI tools analyze workflows and team interaction patterns, providing recommendations for optimizing work processes. This contributes to increased employee satisfaction and productivity.

Ukrainian companies are actively embracing global trends and implementing artificial intelligence technologies, which in some cases radically changes their business processes. The analysis shows that the leaders in implementation are companies that have already experienced real business benefits, particularly in time and resource savings. A clear division is observed: large enterprises, such as DTEK, Metinvest, and Fozzy Group, are investing in their own R&D centers to

develop custom solutions, whereas small and medium-sized businesses more often use off-the-shelf AI tools for specific tasks, such as content generation.

Successful implementation requires a clear strategy and the definition of specific KPIs that AI will help to achieve. The presence of an innovation manager, who can translate technical ideas into business cases, plays a crucial role. In small companies, this function is often performed by the CEO.

Without such a strategic approach, companies risk falling into the "technology for technology's sake" trap, spending significant resources on tools that do not solve real business problems. It is this leader who is responsible for ensuring that every AI initiative begins with the question "What problem are we solving?" or "What opportunity are we creating?", rather than "What new AI model can we use?". This guarantees that investments in innovation are directly linked to financial results and competitive advantages.

Local examples demonstrate that Ukrainian businesses utilize AI not for abstract experimentation, but for addressing specific, pressing operational challenges (Table 2).

Fozzy Group is one of the pioneers in the use of AI in Ukrainian retail. Their R&D division, TemaBit, has developed a range of innovative solutions, including a system for analyzing "Silpo" customer feedback on social media and a product recognition system in restaurants. Their self-service checkout system operates more than 10 times faster than a traditional cashier-operated checkout.

Auchan utilizes iBeacon technology to send personalized promotional offers to customers while they are in the store, which enhances marketing relevance.

VARUS and Epicenter actively apply generative AI (ChatGPT, Midjourney) to automate content creation—from product descriptions to advertising banners and images for complex categories, such as fresh meat.

*Table 2. AI Implementation in Leading Ukrainian Companies*

| ***Company*** | **Industry** | **Business Challenge** | **Implemented AI Solution** | **Stated Result / Advantage** |
|---|---|---|---|---|
| *DTEK* | Energy Sector | Inefficient power line inspection and management of repair crews | AI-powered analysis of drone imagery; optimization of crew routes | Economic effect > UAH 170 million; 10-15% reduction in outages |
| *Metinvest* | Heavy Industry | Manual, error-prone quality control of steel products | Computer vision system for real-time defect detection | Breakthrough in automated quality control; improved material utilization |
| *Fozzy Group* | Retail | Slow service at checkouts; understanding customer sentiment | AI-based self-service checkouts; analysis of social media feedback | Checkout process >10 times faster; improved customer understanding |
| *Astarta-Kyiv* | Agro-sector | Complexity in crop rotation planning and logistics | Proprietary AI assistant (AgriChain) for planning, logistics, and crop assessment | Increased operational efficiency and data-driven decision-making |

*Source: systematized by the authors.*

Astarta-Kyiv, through its proprietary IT company AgriChain, has developed an AI assistant that aids in crop rotation planning, harvest logistics, and crop condition assessment. This exemplifies a deep integration of AI into core production processes.

Kernel and MHP: They are developing predictive models for yield forecasting and utilize AI assistants to optimize poultry and grain cultivation. MHP has invested over $400,000 in the development of its own patented system, "Smart TA."

Metinvest has implemented an advanced computer vision-based solution for real-time quality control of semi-finished products (slabs). The system automatically detects defects on the

production line and provides the operator with recommendations for proper material trimming, which represents a breakthrough for quality control in metallurgy.

DTEK uses AI for a broad spectrum of tasks: from optimizing the routes of mobile repair crews to analyzing data from drones that inspect power lines for damage detection and prediction. These initiatives have a documented economic effect of over UAH 170 million and have enabled a 10-15% reduction in outages in pilot areas.

Ciklum and SigmaSoftware integrate AI into both core software development processes (code generation) and support functions like HR, where AI models are used for resume screening.

These Ukrainian cases reveal an important pattern: the most successful and significant AI implementations pertain not to general-purpose tools, but to the development of highly specialized solutions for key, industry-specific operational problems. DTEK does not simply use a chatbot; the company applies AI to analyze imagery from drones inspecting power lines. Metinvest uses computer vision to detect defects on steel slabs moving at high speed. Astarta uses AI for the complex, specific task of crop rotation planning. This demonstrates that the highest ROI is achieved when AI is applied to the unique, high-risk, and data-rich operational challenges of a specific business. This is a crucial lesson for other companies: seek out the most complex operational problem, as it is likely the most fertile ground for a transformative AI project.

AI implementation is not a one-time project but a strategic initiative that requires a phased approach (Fig. 2).

Phase 1. Start with Education. The first step is a deep understanding of the technology's capabilities and limitations. Numerous educational resources are available on platforms like Udemy, Coursera, and from leading technology companies. It is necessary to identify high-potential business cases. Instead of looking for a place to "fit in" AI, one must understand in which business areas it can provide a real competitive advantage. From the outset, it is essential to define clear and measurable KPIs that the company aims to achieve.

Phase 2. Data and Infrastructure Preparation. The effectiveness of any AI system is directly dependent on the quality and volume of the data it is trained on. Companies must consolidate their data from various sources (CRM, analytics, social media) into a single, accessible format. It is crucial to ensure that the corporate IT infrastructure is ready for the increased computational loads required by AI solutions.


*Fig. 1 Practical Roadmap for AI Integration*
*Source: prepared by the authors.*

Phase 3. Pilot Project and Scaling. Launch a pilot project in a controlled environment. This will allow for concept validation, demonstrate its value to stakeholders, and identify potential issues at an early stage. Following the successful completion of the pilot project, develop a clear plan for the gradual deployment of the solution across the entire organization.

Phase 4. Change Management and Culture. AI implementation is, above all, a change management initiative. Therefore, train and upskill employees so they can work effectively with AI systems rather than compete against them. Company leadership must actively support the initiative, demonstrate its importance, and foster a culture of data-driven decision-making.

**Discussion.** For a responsible and successful implementation of AI, it is necessary to understand and consider the associated risks.

AI systems require vast amounts of data for training, which creates significant confidentiality risks. The business bears full responsibility for data breaches and the unlawful use of customer personal data and commercial information. To protect this data, it is critically important to use closed, secure platforms, especially when working with external AI models, to maintain control over the information and prevent unauthorized access, even by the AI developers themselves. AI models trained on historical data containing hidden biases (e.g., gender or racial) can replicate and even amplify existing discrimination. This can lead to unfair decisions in sensitive areas such as hiring, lending, or even assessing the risk of criminal recidivism. To avoid serious reputational and legal risks, it is necessary to conduct thorough testing and double-checking of the results generated by AI, especially considering the phenomenon of "hallucinations", where models fabricate facts.

The use of third-party intellectual property objects (patents, trademarks, copyrights) to train AI models without proper authorization creates critical legal risks. This can lead to lawsuits, fines, and injunctions against the use of AI-created products. Prominent examples include the high-profile lawsuits by The New York Times against OpenAI and Getty Images against Stability AI, which accuse the developers of illegally using their materials.

The integration of AI requires significant initial investments in technology, infrastructure, and the hiring of qualified specialists. In addition to financial barriers, there is a risk of over-reliance on AI, which can lead to "human laziness" and the atrophy of critical thinking and problem-solving skills among employees.

Generative and multimodal AI have emerged as new trends. Generative AI technology is already transforming the creative industries, content creation, marketing, and even financial forecasting, where models can analyze market data to predict trends. This is also creating demand for new professions, such as "prompt engineers", who specialize in effective interaction with these models. Multimodal models represent the next step in the evolution of AI. Such models are capable of simultaneously understanding and processing information from various sources — text, images, and audio. This will lead to the creation of more intuitive and contextually aware AI systems that can interact with the world in a manner more akin to human interaction.

The concept of AI is evolving from a "tool" to an "agent" or "digital worker". These are autonomous systems capable of independently executing complex, multi-step tasks within business processes. Such AI agents can revolutionize workflow automation, moving beyond simple, repetitive operations.

As the influence of AI grows, so does the global movement towards its regulation. Initiatives such as the "White Paper" from the Ministry of Digital Transformation of Ukraine and international declarations indicate the intent of governments to establish frameworks for the safe and ethical use of the technology. Businesses must closely monitor these changes to ensure compliance with future norms and standards.

**Conclusions**. The analysis indicates that artificial intelligence is a powerful catalyst for profitability, operating through a dual mechanism: a substantial reduction in operational costs and a significant acceleration of revenue growth. AI is not a technological panacea, but a strategic capability that requires meticulous planning, significant investment, and, most importantly, cultural adaptation within the organization.

The experience of leading Ukrainian companies, such as DTEK, Metinvest, and Astarta, provides a key lesson: the highest return on investment in AI is achieved not by implementing

universal solutions, but through the development of highly specialized systems to address fundamental, industry-specific operational problems.

Business leaders must transition from a reactive to a proactive approach in shaping their AI strategy. Waiting for the technology to become mainstream is tantamount to forfeiting a competitive advantage.

The recommended path to begin is as follows: identify a critical, data-rich business problem that has a significant impact on profitability; form a cross-functional team that includes both technical specialists and experts in the relevant business domain; and launch a focused pilot project to demonstrate value and secure support for subsequent scaling.

In the contemporary business landscape, the absence of an artificial intelligence strategy is no longer a neutral choice. It is a deliberate decision to fall behind competitors.

**References**

1. Asad, M., Tuffaha, M., & Al-Hussein, M. (2023). A review of artificial intelligence applications in the logistics and transportation industry. *Cleaner Logistics and Supply Chain*, 7, 100101. DOI: https://doi.org/10.1016/j.clscn.2023.100101
2. Baryannis, G., Validi, S., Dani, S., & Antoniou, G. (2019). Supply chain risk management and artificial intelligence: state of the art and future research directions. *International Journal of Production Research*, 57(7), 2179-2202. Retrieved from: http://dx.doi.org/10.1080/00207543.2018.1530476
3. Carvalho, T. P., Soares, F. A., Vita, R., Francisco, R. D. P., Basto, J. P., & Alcalá, S. G. (2021). A systematic literature review of machine learning methods applied to predictive maintenance. *Computers & Industrial Engineering*, 158, 107680. Retrieved from: http://dx.doi.org/10.1016/j.cie.2019.106024
4. Cohen, M. C., Perakis, G., & Pindyck, R. S. (2017). Dynamic pricing in a non-stationary environment. *Management Science*, 63(3), 647-660. DOI: https://doi.org/10.1287/mnsc.2015.2341
5. Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review*, 96(1), 108-116.
6. den Boer, A. V. (2023). A review of dynamic pricing: From theory to data-driven applications. *European Journal of Operational Research*, 307(2), 487-505. Retirieved from: https://doi.org/10.1016/j.ejor.2022.09.022
7. Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., ... & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, 59, 102168. DOI: https://doi.org/10.1016/j.ijinfomgt.2020.102168
8. Gupta, S., Meissonier, R., Drave, V. A., & Roubaud, D. (2021). The future of artificial intelligence in marketing: A taxonomy and research agenda. *Journal of Business Research*, 128, 77-90. DOI: https://doi.org/10.1016/j.jbusres.2021.01.034
9. Horiach, H., & Horiach, V. (2023). Transformation of supply chains and logistics with the help of artificial intelligence to increase efficiency and profitability. *Herald of Khmelnytskyi National University. Economic sciences*, 6, 137-143. [in Ukrainian].
10. Illiashenko, S. M., & Shypulina, Yu. S. (2023). Marketing dynamic pricing as a progressive trend of the digital society. *Problems of systemic approach in economy*, 1(90), 49-55. DOI: https://doi.org/10.32752/2520-2200-2023-1-90-49-55 [in Ukrainian].
11. Krakovetska, L. M. (2021). Transformation of business processes of enterprises in the conditions of digitalization. *Economics and management of the national economy*, 41, 68-73. [in Ukrainian].
12. Kumar, V., Rajan, B., Singh, N. D., & Singh, D. L. (2019). Getting to “smarter” marketing: How AI is changing the game. *Journal of the Academy of Marketing Science*, 47(6), 1125-1131.
13. Mikalef, P., & Gupta, M. (2021). Artificial intelligence capability: Conceptualization, measurement, and impact on firm performance. *Information & Management*, 58(3), 103434. DOI: https://doi.org/10.1016/j.im.2021.103434
14. Pavlovskyi, M. V., Hatska, L. P., & Zavadska, O. M. (2023). Digital transformation of business in the conditions of modern changes. *Economy and society*, 50. DOI: https://doi.org/10.32782/2524-0072/2023-50-31 [in Ukrainian].
15. Prychepa, Y. Y., & Kobets, V. M. (2022). Artificial intelligence as a tool for increasing the efficiency of the enterprise's marketing activities. *Herald of Khmelnytskyi National University. Economic sciences*, 2, 194-199. [in Ukrainian].
16. Trushkina, N. V. (2021). Digital transformations in logistics and supply chain management based on artificial intelligence. *Economic Herald of the Donbas*, 1(63), 114-125. Retrieved from: https://www.google.com/search?q=https://doi.org/10.12958/1817-3772-2021-1(63)-114-125 [in Ukrainian].

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**Поліпшення результативності бізнесу шляхом застосування штучного інтелекту**

***Анотація.*** Об'єктом дослідження є штучний інтелект (ШІ) як стратегічний інструмент трансформації сучасних бізнес-процесів. Ключовими характеристиками ШІ в контексті бізнесу є його здатність до обробки великих масивів даних, автоматизації операцій, оптимізації ресурсів та створення персоналізованого клієнтського досвіду, що в сукупності впливає на результативність діяльності компанії.

**Постановка проблеми.** В умовах прискореної цифровізації перед бізнесом постає фундаментальна проблема переходу від загального розуміння потенціалу ШІ до його практичної інтеграції для досягнення вимірюваних фінансових результатів. Необхідно чітко ідентифікувати та систематизувати конкретні механізми, за допомогою яких технології ШІ безпосередньо впливають на прибутковість.

**Нерозв'язані аспекти.** Попри значну кількість досліджень, присвячених окремим аспектам застосування ШІ, бракує комплексного аналізу, який би систематизував його вплив. Також недостатньо уваги приділено розробці практичної дорожньої карти для інтеграції ШІ.

**Мета статті.** Метою статті є систематизація ключових механізмів впливу штучного інтелекту на результативність бізнесу та розробка структурованого підходу до його стратегічного впровадження для максимізації прибутковості.

**Основний матеріал.** У дослідженні використано метод системного аналізу для структурування впливу ШІ на бізнес через модель «подвійного двигуна». Розглянуто такі інструменти, як інтелектуальна автоматизація, предиктивне обслуговування, динамічне ціноутворення та гіперперсоналізація. Проаналізовано кейси провідних українських компаній.

**Висновки**. Встановлено, що ШІ діє як каталізатор прибутковості, синергетично впливаючи на зниження операційних витрат та прискорення зростання доходів. Обґрунтовано, що успішна інтеграція вимагає чіткої стратегії, поетапного підходу та культурної адаптації. Відсутність стратегії щодо ШІ в сучасному бізнес-середовищі є свідомим вибором на користь втрати конкурентної переваги.

***Ключові слова****: оптимізація процесів, динамічне ціноутворення, персоналізація, операційна ефективність, автоматизація, менеджмент.*

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**Список літератури**

1. Asad M., Tuffaha M., Al-Hussein M. A review of artificial intelligence applications in the logistics and transportation industry. *Cleaner Logistics and Supply Chain*. 2023. Vol. 7. 100101. DOI: https://doi.org/10.1016/j.clscn.2023.100101.
2. Baryannis, G., Validi, S., Dani, S., & Antoniou, G. (2019). Supply chain risk management and artificial intelligence: state of the art and future research directions. *International Journal of Production Research*, 57(7), 2179-2202. Retrieved from: http://dx.doi.org/10.1080/00207543.2018.1530476.
3. Carvalho, T. P., Soares, F. A., Vita, R., Francisco, R. D. P., Basto, J. P., & Alcalá, S. G. (2021). A systematic literature review of machine learning methods applied to predictive maintenance. *Computers & Industrial Engineering*, 158, 107680. Retrieved from: http://dx.doi.org/10.1016/j.cie.2019.106024.
4. Cohen M. C., Perakis G., Pindyck R. S. Dynamic pricing in a non-stationary environment. *Management Science*. 2017. Vol. 63, No. 3. P. 647–660. DOI: https://doi.org/10.1287/mnsc.2015.2341.
5. Davenport T. H., Ronanki R. Artificial intelligence for the real world. *Harvard Business Review*. 2018. Vol. 96, No. 1. P. 108–116.
6. den Boer, A. V. (2023). A review of dynamic pricing: From theory to data-driven applications. *European Journal of Operational Research*, 307(2), 487-505. Retirieved from: https://doi.org/10.1016/j.ejor.2022.09.022.
7. Dwivedi Y. K., Ismagilova E., Hughes D. L., Carlson J., Filieri R., Jacobson J., Wang Y. Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*. 2021. Vol. 59. 102168. DOI: https://doi.org/10.1016/j.ijinfomgt.2020.102168.

8. Gupta S., Meissonier R., Drave V. A., Roubaud D. The future of artificial intelligence in marketing: A taxonomy and research agenda. *Journal of Business Research*. 2021. Vol. 128. P. 77–90. DOI: https://doi.org/10.1016/j.jbusres.2021.01.034.
9. Horiach H., Horiach V. Transformation of supply chains and logistics with the help of artificial intelligence to increase efficiency and profitability. *Herald of Khmelnytskyi National University. Economic sciences*. 2023. No. 6. P. 137–143. [in Ukrainian].
10. Illiashenko S. M., Shypulina Yu. S. Marketing dynamic pricing as a progressive trend of the digital society. *Problems of systemic approach in economy*. 2023. Vol. 1(90). P. 49–55. DOI: https://doi.org/10.32752/2520-2200-2023-1-90-49-55. [in Ukrainian].
11. Krakovetska L. M. Transformation of business processes of enterprises in the conditions of digitalization. *Economics and management of the national economy*. 2021. Vol. 41. P. 68–73. [in Ukrainian].
12. Kumar V., Rajan B., Singh N. D., Singh D. L. Getting to “smarter” marketing: How AI is changing the game. *Journal of the Academy of Marketing Science*. 2019. Vol. 47, No. 6. P. 1125–1131.
13. Mikalef P., Gupta M. Artificial intelligence capability: Conceptualization, measurement, and impact on firm performance. *Information & Management*. 2021. Vol. 58, No. 3. 103434. DOI: https://doi.org/10.1016/j.im.2021.103434.
14. Pavlovskyi M. V., Hatska L. P., Zavadska O. M. Digital transformation of business in the conditions of modern changes. *Economy and society*. 2023. Vol. 50. DOI: https://doi.org/10.32782/2524-0072/2023-50-31. [in Ukrainian].
15. Prychepa Y. Y., Kobets V. M. Artificial intelligence as a tool for increasing the efficiency of the enterprise's marketing activities. *Herald of Khmelnytskyi National University. Economic sciences*. 2022. No. 2. P. 194–199. [in Ukrainian].
16. Trushkina N. V. Digital transformations in logistics and supply chain management based on artificial intelligence. *Economic Herald of the Donbas*. 2021. Vol. 1(63). P. 114–125. DOI: https://doi.org/10.12958/1817-3772-2021-1(63)-114-125. [in Ukrainian].

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# Theoretical and practical principles of accounting and analytical support for investment project management

***Abstract.*** A modern enterprise carries out various business operations, in particular those related to investing in projects. Therefore, an important condition for effective management decision-making is the formation and work on accounting and analytical support for these processes.

**Problem statement.** In modern literature, various scientific concepts are used, such as accounting and analytical information, information and accounting system, accounting and analytical system, information and accounting support, accounting and analytical support, etc., which quite often have much in common and do not contain distinctive characteristics. This also fully applies to the accounting and analytical support of the management of investment projects of an enterprise in the theoretical and practical plane.

**Unresolved aspects of the problem.** The sequence of use and the connection between the above scientific categories, accounting and analytical support of the process of making managerial decisions has not been established.

**The purpose of the article** is to analyze and derive patterns regarding the theoretical and practical principles of accounting and analytical support of the management of investment projects of an enterprise.

**Presentation of the main material.** Based on the results of the research, a scheme of accounting and analytical support of the process of making managerial decisions with the allocation of input and output information flows and the division of accounting into financial and managerial. The author's interpretation of the scientific category of accounting and analytical support for investment project management is presented. A list of information and communication technologies and their characteristics are given to increase the efficiency and efficiency of the accounting and analytical support of investment project management. The levels of artificial intelligence support in investment project management are given, with the distinction of levels of automation, assistance and addition.

**Conclusions.** The presented study made it possible for the first time to substantiate and provide a definition of accounting and analytical support for investment project management, which fully reflects the current state of this issue. The presented scheme of accounting and analytical support for the process of making managerial decisions in combination with information and communication technologies (artificial intelligence, machine learning, big data, cloud technologies) will ensure the prompt and effective implementation of accounting and analytical work, increase the practical orientation of the received initial data for the formation and implementation of the strategic and tactical goals of the enterprise regarding investment project management.

***Keywords:*** *accounting and analytical support, management, management accounting, investment project, investment project management.*

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**Introduction.** Enterprise management is based on effective documentary support. In addition to conducting operational activities, the enterprise also finances capital investments, shares in other enterprises, purchases and sells securities, invests in bonds, etc. For these purposes, it is necessary to carry out appropriate work on accounting and analytical support for investment project management. Achieving the outlined areas requires the purchase and adjustment of software, training or retraining of specialists (accountants and/or analysts), concluding contracts with provider companies for further maintenance, purchasing the necessary computer software, etc. Thus, the study of the theoretical foundations and practical aspects of accounting and analytical support for investment project management is timely and relevant.

**Literature Review.** The issues of accounting and analytical support (AAS) of investment activity management (AAMS) are studied by Ukrainian scientists. Among the scientific works, the achievements of Kovalchuk S. (2019) should be highlighted, who paid attention to the AAMS of investment projects. Investigating the content of the above definition, the author identified its components - accounting and analysis, which serve as the basis for accumulating data for making management decisions. Iershova N. Y. and Lynnyk O. I. (2021), in turn, investigated information and accounting support for the purposes of investment analysis of an enterprise. The basis of their work also states about management accounting, which can be differentiated into several components - accounting and analysis. The first provides for the collection, accumulation and processing of information, the second - analytical procedures. From the above, it follows that there are no significant differences between the authors' approaches, which is not entirely true. A similar opinion is held by Nitsenko V.S. (2012). In our opinion, AAS is the next stage of work, i.e. analysis for the purposes of enterprise management, and information and accounting support is the first stage, i.e. a system for registering, accumulating and processing information.

Some scientists see the solution to this issue through a conceptual update of the accounting policy of the enterprise (Derechyn et al., 2007; Dmytrenko, 2024). According to the authors, changes in the legislative sphere should also be reflected in the accounting policy of the enterprise. We support the vision of scientists, however, enterprises do not always respond promptly and promptly to changes in regulatory policy, therefore these issues are not always reflected in the accounting policy.

Larikova T. (2025) identified shortcomings in the AAMS of budget funds administrators, and therefore of enterprises that perform contract execution, according to concluded agreements. The author pointed out the imperfection of the existing system of information support and data analysis and management, the systematicity of financial and non-financial indicators, the low level of use of innovative technologies and solutions in AAMS. Continuing the research, Larikova T. (2025), Polishchuk I. R., Vyhivska I. M. and Makarovych V. K. (2022) conclude that it is appropriate to verify and confirm financial and non-financial indicators calculated according to the financial statements published on the official website of the enterprise, which will significantly strengthen AAMS in all processes, including the investment component. Iershova N. (2024), supplementing the opinions of previous authors, points to the need to combine budgeting in the context of planning operational and investment processes with accounting support and AAMS of the enterprise.

Other researchers (Ivata, Pohorielova & Burlan (2023); Shubina et al. (2025); Kriukova & Nitsenko (2016)) point to the need to consider issues related to investment activities, namely: the business processes of the enterprise, fixed assets and the efficiency of their management, and land resources, which can be considered as an effective direction of investment. We agree with these views, since all of the above components can affect the scale of activity, the continuity of the operating cycle, increase the quality of work and services performed, their productivity and efficiency, etc. Thus, the above processes require appropriate AAMS.

The specified directions of AAMS of investment processes at the enterprise, according to Mykytyuk P. and Mykytyuk Yu. (2023), should be provided by economic and mathematical modeling. Using the "Flow" technology, the authors propose to ensure the phased implementation

of project work, according to the approved schedule and cost control. The output information flows create a system of data necessary for AAMS of investment projects.

Therefore, AAMS of investment activities require further development, especially in conditions of instability, crisis and challenges facing enterprises. Therefore, it is these gaps that the authors will try to address in the course of this scientific study.

**Purpose, objectives and methods of the study.** The purpose of the work is to analyze and derive patterns regarding the theoretical and practical foundations of AAMS by investment projects of the enterprise.

Based on the purpose of the study, the following tasks were set: to analyze modern approaches to the interpretation of the scientific concept of AAS and to give the author's understanding of the scientific definition of AAMS of investment project; to build and describe the AAS scheme of the process of making management decisions at the enterprise; to analyze modern approaches to information and communication technologies and establish a connection with AAMS of investment project.

During the study, the authors used the following methodological tools: general scientific methods of cognition (induction and deduction, analysis and synthesis) to determine the directions of development of the researched issue in time; a systematic approach for a general vision of the development of the theoretical foundations of AAMS by investment activities of the enterprise; theoretical generalization for formulating conclusions from the conducted research; classification for dividing the main objects of research according to established criteria or features.

**Results.** The process of making managerial decisions requires clarification of the essence of the terminology used. In scientific works, various definitions are used, such as accounting and analytical information (AAI), information and accounting system (IASm), accounting and analytical system (AASm), information and accounting support (IAS), AAS, etc. Let us consider the above scientific categories in more detail.

Thus, under AAI Podolianchuk O.A. (n.d.) understands a set of financial accounting data that provide the necessary information (about all aspects of economic activity) for the process of making managerial decisions.

Machuha R.I. (2007) reveals the content of IASM as a set of technical and organizational measures for the accumulation, systematization, grouping, processing and transmission of accounting data on financial and economic processes at the enterprise.

Yuzva R.P. (2008) understands AASM as a set of different types of data and information combined into a single system that ensures the adoption of managerial decisions.

Chornenka O. and Boiarchuk S. (2024) concluded that IAS is a system that provides the accumulation, systematization, analysis and transmission of information on the financial and economic processes of the enterprise.

Pelekh U. (2022) substantiated and presented the following understanding of AAS - a system that provides accumulation, processing and analysis of information and data, which ensures the adoption of management decisions.

Summarizing the above, we have formed a process of accounting and analytical support for making management decisions (Fig. 1).

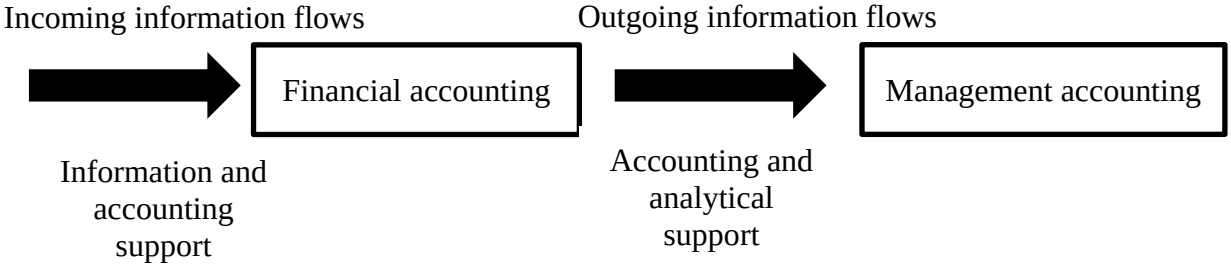


*Fig. 1. Accounting and analytical support for the process of making management decisions*
*Source: author's development.*

This approach is universal and can be used for any direction of work or research, that is, for AAMS of investment projects.

AAS contains a set of information and data on the external and internal environment of the enterprise and is necessary in the process of assessing and analyzing economic phenomena and processes for management purposes (Hnylyts'ka, 2011).

That is why Ryzhikova N., Birchenko N. and Bogomolov O. (2024) indicate that AASM should provide timely monitoring of financial and economic indicators, risk assessment and development of effective management decisions. Despite this, the authors continue, there is a gap in the integration of modern information technologies and data analysis methods adapted to the operating conditions of enterprises, which affects the level of their efficiency. This is fully inherent in the processes of AAMS of investment projects of enterprises at the current stage of management.

Iershova N. Y. and Lynnyk O. I. (2021) presented a general view and description of AAMS of investment projects over time in a simplified form. In their opinion, the basis of the constructed model should include the types of information needed to make management decisions regarding the investment component, information users (internal and external stakeholders), informational goal-setting (quantitative assessment of data for management purposes), possible barriers (lack of funds, advantages and disadvantages, opportunism, etc.).

Continuing this thesis, Kovalchuk S. (2019) proposes to divide the AAMS research of investment projects into the appropriate stages: pre-investment, investment and final stage. Using the specified stratification of the stages of work, the author comes to the conclusion that achieving the goals of an investment project requires appropriate tools for managing it.

Thus, AAMS of investment projects is a system of accumulation, processing and analysis of information and data coming from external and internal sources, designed to achieve strategic and tactical goals for the implementation of an investment project and its management.

Investment project management should be based on achievements and innovative developments in the field of information and communication technologies. The most common include: artificial intelligence, machine learning, big data, cloud technologies. The specified list is not exhaustive and may change over time and depending on the needs of specialists and managers.

Since artificial intelligence has recently become a key driver of development, its use in investment process management has also changed the approach to work. According to Derkach M. (2023), artificial intelligence provides processing of significant data sets and helps investors develop strategies for behavior in the market. Although this technology is not new, the use of machine learning and neural networks significantly enhances the quality of analysis and developed strategies. According to him, artificial intelligence provides more accurate data that can affect management decisions, and which a person sometimes does not pay attention to, as a result, it can significantly change the amount of investment resources.

The importance of this phenomenon for project management is evidenced by a survey conducted by PMI (2023), which has a practical focus. According to the survey results, 1/5 of respondents constantly use artificial intelligence for decision-making processes and optimization of business operations, and 4/5 of senior management expect an increase in the impact of artificial intelligence on project management strategies.

Another study by Capterra (Taylor, 2023) indicated that 77% of respondents are optimistic about the use of artificial intelligence in their work and only 8% indicated that they do not plan to implement it in their activities. Among those surveyed, 93% expect a return on investment within the next 12 months.

In general, for specialists and managers who use artificial intelligence in their practical work, there are benefits available in optimizing investment project management, including the issue of strategy formation and implementation of set goals, which is achieved through improving the efficiency and quality of management decisions. Vasylenko V.M. and Vakaliuk T.A. (2024) showed that artificial intelligence significantly changes the process of processing incoming

information and making management decisions. The authors proposed various versions of supporting the investment project management process, namely: automation (performing routine tasks with artificial intelligence, which ensures improved consistency and increased efficiency of the tasks performed), assistance (using already processed and prepared data, artificial intelligence evaluates and provides recommendations for making the best management decision) and supplementation (helps managers solve difficult problems and make strategic decisions based on them) (Fig. 2). The proposed approach ensures the maximization of the achievement of the outlined goals and objectives, adaptation to the changing conditions of the investment project implementation, and will enable the most successful combination between automation processes and human labor and time costs.

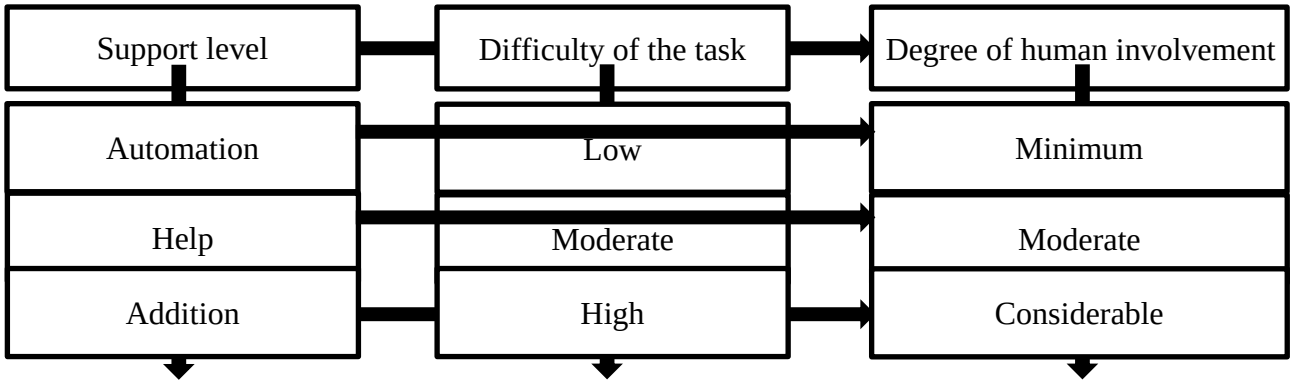


*Fig. 2. Levels of artificial intelligence support in investment project management*
*Source: constructed using Vasylenko V.M. and Vakaliuk T.A. (2024).*

An integrated technology for artificial intelligence is machine learning. Machine learning enables artificial intelligence to learn using ready-made data templates, as well as to gain new knowledge and experience in the process of work, which allows it to adapt more quickly to the list of tasks it performs. Along with the positive aspects, there are obstacles to the use of artificial intelligence. Thus, according to the results of a Stanford study (Taranenko, Safonov and Duka, 2023), respondents noted security problems with the use of artificial intelligence - 50%, a lack of important open financial data for training artificial intelligence models - 44%. Among other reasons that hinder the development, respondents named the lack of evidence of the value of artificial intelligence - 37%, they cannot navigate in choosing a technology or product - 33% and they see obstacles to the implementation of artificial intelligence - 42%. In general, the investment deal market in 2022 had a growth trend – according to CB Insights – to almost $46 billion. Another study, by PitchBook, the market size grew to $78 billion, by Stanford University – to almost $92 billion (Taranenko, Safonov and Duka, 2023). Despite the lack of a single view of the market size, the fact of the implementation of these technologies in business processes and the further growth of investments in this industry is undeniable.

Big data, in turn, provides the formation, analysis and storage of various types of large volumes of information and data obtained from various sources (open data on the Internet, social networks, data from previous analytical studies, etc.), which ensures the effective management of investment projects. This technology is closely related to cloud technology, where all this data is stored, artificial intelligence and machine learning, which provide processing and analysis of information and data, form patterns of behavioral models, etc. (Makedon and Kovnir, 2024).

An important place in the AAMS of investment project system belongs to cloud technologies. This type of technology allows you to save money, provide access to the investment project at any time and place, flexibility in working with projects, generate and provide access to interim and completed reports, analyze and monitor financial indicators of the investment project, etc. In this regard, Bataev S. V. and Melnyk O. S. (2024) provide a list of challenges associated with the use of

cloud technologies for legal entities. The legal and regulatory obstacles include problems with data retention in the region or country of the company's location - 50%, compliance with local rules and laws - 55%, processing of personal data - 65%, the threat of gaining access to data by third parties - 70%, data confidentiality - 75%, data security - 80%.

**Discussion.** The conducted research showed that many scientists do not distinguish the content of the following scientific concepts: AAI, IASM, AASM, IAS and AAS. Their content often remains identical or similar and it is difficult to understand how they differ from each other. Therefore, we propose to use an approach based on the distinction and complementarity of concepts. According to our vision, IAS is the preliminary stage at which the accumulation, processing (grouping and systematization) and transfer of information to the next level, i.e. to the AAS stage, takes place. In turn, AAS receives information about economic processes and phenomena, analyzes it and, on this basis, develops and presents forecast strategies that will serve as a basis for making management decisions.

The above facts made it possible to summarize the conducted research and obtain Figure 3.

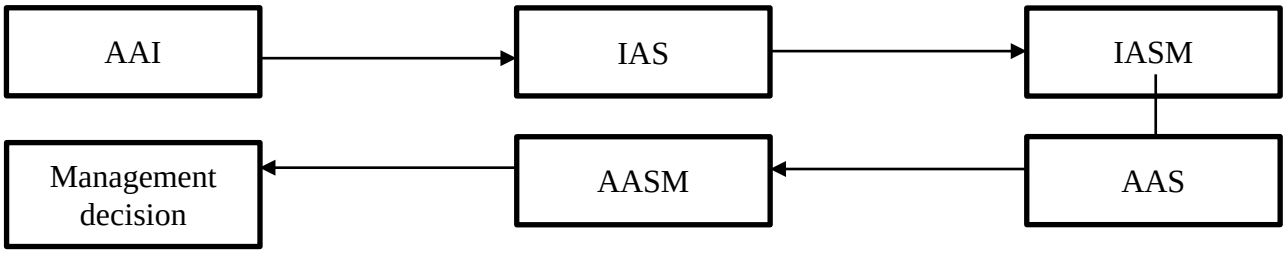


*Fig. 3. AAMS of investment project scheme*
*Source: author's development.*

In connection with the above, Kovalchuk S. (2019) highlights several components related to AAS: accounting and analytical. She further argues that it is inappropriate to include control or audit in AAS, since these management functions are also based on AAS, but are intended to fulfill other goals. In this vein, studying the AAS of the budgeting process, Iershova N. (2024) points out the multifaceted nature of this scientific category and includes the following elements of the system: accounting, control, analysis and planning. In her opinion, such an approach will provide sufficient IAS of the budgeting process. In our opinion, the vision of Kovalchuk S. (2019), which we fully support and also consider that control functions are not included in AAMS of an investment project, is more substantiated.

The formation of an effective AAMS system of an investment project should be based not only on the financial indicators of the project, but also on indicators of non-financial reporting, states Larikova T. (2025). The optimal combination of indicators and relationships between them for a sound management decision is noted by Polishchuk I. R., Vyhivska I. M. and Makarovych V. K. (2022). Indeed, the issue of forming and presenting non-financial reporting comes to the fore, especially in the context of implementing sustainable development goals.

Information and communication technologies play an important role in the growing needs of AAS. Without the use of modern innovative technical solutions, rapid processing of ever-growing volumes of information and data sets is time-consuming and inefficient. Therefore, scientists and specialists have developed and disseminated many different novelties, among which it is possible to highlight the ever-growing role of artificial intelligence, machine learning, big data sets, cloud technologies, etc. Taranenko I., Safonov D., and Duka V. (2023) emphasize the exceptional role of these technologies in helping business, since, for example, artificial intelligence allows you to increase the productivity of information processing, work according to established templates using machine learning, reduce the level of errors, and improve efficiency. They provide supporting forecast data, according to which in the 12 most developed economies the level of economic

productivity will grow by more than a third by 2035 and will allow you to increase the volume of the economy by $ 14 trillion. dollars.

Sysoieva I. et al. (2024) gives an example of implementing an ERP system that provides comprehensive automated information processing for all divisions of the company. This integrated tool allows you to reduce the time spent on processing accounting tasks, generate financial reporting documents on request, and adapt to a changing market environment. ERP systems really not only provide a reduction in the cost of time, energy, human and material resources. In connection with artificial intelligence, this tool will not only increase the productivity and efficiency of processes, but also ensure the prompt receipt of timely, complete and unbiased information in a processed form for making management decisions regarding investment projects. This thesis is also confirmed by the research of Datsun V. V. (2016), which notes that AAS automation improves the results of the analysis of any investment project, determines the performance indicators and the required coefficients for the characteristics of investment projects, establishes the influence of exogenous and endogenous factors on the financial results of the enterprise and the project in particular. This, first of all, provides an opportunity to choose the most effective option for implementing an investment project from among the developed strategies.

**Conclusions**. The current state of AAMS of investment projects is at an inadequate level. Military operations, insufficient financial support for investment and innovation activities in the country, changing the location of the company abroad and other factors have led to a low level of effective dissemination of AAMS of investment projects.

Despite the prevalence in the economic literature of a large number of various scientific definitions, such as: AAI, IASM, AASM, IAS and AAS, scientists do not always pay due attention to the delimitation of their content and use. Analysis of scientific interpretations, for example, IASM and AASM, sometimes coincide and it is not clear what their difference is. Similarly with IAS and AAS. Therefore, it is important to determine what AAMS of investment projects are. In the author's understanding, it is a system of accumulation, processing and analysis of information and data coming from external and internal sources, designed to achieve strategic and tactical goals for the implementation of an investment project and its management.

Since the modern development of AAMS of investment projects is unthinkable without information and communication technologies, further development is seen in maximizing the automation of most accounting processes using artificial intelligence, machine learning, big data, cloud technologies. The above facts have shown an increase in the efficiency and effectiveness of AAS, the calculation of the necessary coefficients and indicators using external and internal information and data, the formation of a set of strategies and the selection of the best of the alternatives, etc. The indicated areas of work according to the research of scientists for the business processes of enterprises will provide savings in money, time, human resources, reduce the risk of errors, and increase the effectiveness of economic activity. In further research, the authors will address a range of issues related to the economic justification of the implementation of AAMS of investment projects.

**References**

1. Iershova, N. (2024). Accounting and analytical support of budgeting with the purpose of achieving its flexibility and performing a control function in the process of financial forecasting. *Financial and Credit Systems: Prospects for Development*, 4(15), 43-52. DOI: https://doi.org/10.26565/2786-4995-2024-4-04
2. Bataev S. V., Melnyk O. S. (2024). Analysis of the principles of work, advantages and challenges in the use of cloud technologies in today's conditions. *Scientific notes of the V. I. Vernadsky TNU. Series: Technical Sciences*, 35(74/3), 31–36. DOI: https://doi.org/10.32782/2663-5941/2024.3.1/06 [in Ukranian]
3. Chornenka, O., Boiarchuk, S. (2024). Strategic approach to information accounting support of financial-economic security in the context of circular economy. *Economy and Society*, 61. DOI: https://doi.org/10.32782/2524-0072/2024-61-79
4. Datsun, V. V. (2016). Information technology in the management of investment projects. *Herald of Khmelnytskyi National University. Economic* sciences, 5(2), 30-32.
5. Derechyn, V.V., Nitsenko, V.S., Sukhii, Ya.V., Chumachenko, O.V. (2007). Formation of accounting policy at the enterprise. Proceedings of the Fifth International Scientific and Practical Conference “Market Transformation of the Agro-Industrial Complex Economy”. Kharkiv: KhNTUSH., pp. 194-196.

6. Derkach, M. (2023).How Artificial Intelligence Is Applied in the Investment Sphere — Analytics. *PaySpace Magazine*. Retrieved from: https://psm7.com/uk/technology/iskusstvennyj-intellekt-kak-instrument-dlya-investicij-kak-eto-rabotaet-i-kakie-funkcii-vypolnyaet.html [in Ukranian]
7. Dmytrenko, A.V. (2024). Accounting policy as a key tool for achieving financial success and sustainability of a business entity. *Economics and Region*, 4 (95), 178–188. DOI: https://doi.org/10.26906/EiR.2024.4(95).3624 [in Ukranian]
8. Hnylyts'ka, L.V. (2011). Cloud-analytical information as the primary official in ensuring economic security of subjects of government. *Bulletin of the Volodymyr Dahl East Ukrainian National University*, 3 (157), 57-65.
9. Iershova, N. Y., Lynnyk, O. I. (2021). Information and accounting support for investment analysis of business for management decision making in industry 4.0. *Bulletin of the National Technical University "KhPI" (economic sciences)*, 1, 25-31. DOI: https://doi.org/10.20998/2519-4461.2021.1.25 [in Ukranian]
10. Ivata, V., Pohorielova, O., Burlan, S. (2023). Accounting and analytical support of business processes in conditions of economic instability: key aspects. *Economy and Society*, 50. DOI: https://doi.org/10.32782/2524-0072/2023-50-46 [in Ukranian]
11. Kovalchuk, S. (2019). Accounting and analytical support of management of investment projects of the enterprise. *Management and Entrepreneurship: Trends of Development*, 1(07), 8-17. DOI: https://doi.org/10.26661/2522-1566/2019-1/07-01
12. Kriukova, I.O., Nitsenko, V.S. (2016). Accounting and analytical support for effective management of land resources of agrarian business structures. *Market economy: modern management theory and practice*, 15(3(34)), 7-23.
13. Larikova, T. (2025). Formation of the accounting and analytical support system for managing the activities of budget funds managers under conditions of sustainable development. *Finance of Ukraine*, 5, 84-97. DOI: https://doi.org/10.33763/finukr2025.05.084 [in Ukranian]
14. Machuha, R.I. (2007). Informational accounting systems: functions, aim and objectives. *The Journal of Zhytomyr State Technological University. Series: Economics*, 42(4), 117-125.
15. Makedon, V., Kovnir, O. (2024). Digital transformation of the investment project management process of the enterprise. *State and regions. Series: Economics and Business*, 3(133), 76-82. DOI: https://doi.org/10.32782/1814-1161/2024-3-11 [in Ukranian]
16. Mykytyuk, P., Mykytyuk, Yu. (2023). Management of the Effectiveness of Investment Planning Using Economic and Mathematical Modeling. *Herald of Economics*, 1, 166-181. DOI: https://doi.org/10.35774/visnyk2023.01.166
17. Nitsenko, V.S. (2012). Management accounting in the management system of an agricultural holding. *Management of a Modern Enterprise: Proceedings of the 7th International Scientific and Practical Conference.* (Kyiv, 22-23 bereznia 2012 r.). K.: NUKhT, pp. 240-241.
18. Pelekh, U. (2022). Accounting and analytical support of realization of strategic goals of the enterprise activity in the conditions of digital economy. *Economy and Society*, 39. DOI: https://doi.org/10.32782/2524-0072/2022-39-36 [in Ukranian]
19. PMI: Project Management Institute (2023). Shaping the future of project management with AI. Retrieved from: https://www.pmi.org/learning/thought-leadership/ai-impact/shaping-the-future-of-project-management-with-ai
20. Podolianchuk, O.A. (n.d.). The Essence of Accounting and Analytical Information and Its Role in the Internal Control System of an Agricultural Enterprise. Retrieved from: http://repository.vsau.org/getfile.php/2161.pdf [in Ukranian]
21. Polishchuk, I. R., Vyhivska, I. M., Makarovych, V. K. (2022). Accounting and analytical support for managing the reliability of financial reporting indicators. *Problems of Theory and Methodology of Accounting, Control and Analysis*, 1, 17-22. DOI: http://dx.doi.org/10.26642/pbo-2022-1(51)-17-22 [in Ukranian]
22. Ryzhikova, N., Birchenko, N., Bogomolov, O. (2024). The role of accounting and analytical systems in ensuring investment security in the agricultural sector of Ukraine. *Economy and Society*, 68. DOI: https://doi.org/10.32782/2524-0072/2024-68-121 [in Ukranian]
23. Shubina, S., Piskunov, R., Nitsenko, V., Miroshnyk, O., Pelykh, D. (2025). Accounting and analytical support of the efficiency of fixed assets use in managing the efficiency of business processes of the enterprise. *Financial and Credit Systems: Prospects for Development*, 1(16), 88-100. DOI: https://doi.org/10.26565/2786-4995-2025-1-07
24. Sysoieva, I., Holovai, N., Tsikhanovska, O., Sulko, Ye., Zaika, Ye. (2024). Modern accounting and control tools as drivers of efficiency in innovation and investment activities of enterprises. *Modeling the development of the economic systems*, 4, 258–263. DOI: https://doi.org/10.31891/mdes/2024-14-34
25. Taranenko, I., Safonov, D., Duka, V. (2023). Artificial intelligence and machine learning: what is happening in the market and what are the prospects for the industry. *Speka*. Retrieved from: https://speka.media/stucnii-intelekt-i-masinne-navcannya-shho-vidbuvajetsya-na-rinku-i-yaki-perspektivi-galuzi-9qz4g9 [in Ukranian]
26. Taylor, P. (2023). The state of AI in PM: leading project manager unpacks brand new capterra data. *Capterra*. Retrieved from: https://www.capterra.com/resources/data-on-ai-in-project-management/
27. Vasylenko V.M., Vakaliuk T.A. (2024). Artificial intelligence in project management: analysis of modern research and development prospects. *Scientific notes of Taurida National V.I. Vernadsky University". Series: Technical Sciences*, 35(74/4), 60-67. DOI: https://doi.org/10.32782/2663-5941/2024.4/10 [in Ukranian]
28. Yuzva, R.P. (2008). *The Accounting and Analytical System – Information Support for Enterprise Management. Accounting and Finance*, 11-12 (32–33), 90–94.

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## Теоретичні та практичні засади обліково-аналітичного забезпечення управління інвестиційними проєктами

***Анотація.*** Сучасне підприємство проводить різноманітні господарські операції, зокрема пов'язані з інвестуванням в проєкти. Тому важливою умовою ефективного забезпечення прийняття управлінських рішень є формування та робота з обліково-аналітичного забезпечення даними процесами.

**Постановка проблеми.** В сучасній літературі використовуються різні наукові поняття, такі як обліково-аналітична інформація, інформаційно-облікова система, обліково-аналітична система, інформаційно-облікове забезпечення, обліково-аналітичне забезпечення тощо, які досить часто мають багато спільного й не містять відмінних характеристик. Також це в повній мірі стосується й обліково-аналітичного забезпечення управління інвестиційними проектами підприємства в теоретичній та практичній площині.

**Нерозв'язані аспекти.** Не встановлено послідовність використання та зв'язок між вище приведеними науковими категоріями, обліково-аналітичного забезпечення процесу прийняття управлінських рішень.

**Мета статті** полягає в аналізі та виведення закономірностей щодо теоретичних та практичних засад обліково-аналітичного забезпечення управління інвестиційними проектами підприємства.

**Основний матеріал.** За результатами досліджень сформовано схему обліково-аналітичного забезпечення процесу прийняття управлінських рішень з виділенням вхідних та вихідних інформаційних потоків та поділом бухгалтерського обліку на фінансовий та управлінський. Подано авторське трактування наукової категорії обліково-аналітичного забезпечення управління інвестиційними проєктами. Приведено перелік інформаційно-комунікаційних технологій та їх характеристику для підвищення ефективності та оперативності ОАЗ управління інвестиційними проєктами. Подано рівні підтримки штучного інтелекту в управлінні інвестиційним проєктом з виокремленням рівнів автоматизації, допомоги та доповнення.

**Висновки**. Представлене дослідження дало змогу вперше обґрунтувати та навести визначення обліково-аналітичного забезпечення управління інвестиційними проєктами, яке повністю відображає сучасний стан даного питання. Наведена схема обліково-аналітичне забезпечення процесу прийняття управлінських рішень у поєднанні з інформаційно-комунікаційними технологіями (штучний інтелект, машинне навчання, великі масиви даних, хмарні технології) забезпечить оперативне та ефективне проведення обліково-аналітичних робіт, підвищить практичну спрямованість отриманих вихідних даних для формування та реалізації стратегічних та тактичних цілей підприємства щодо управління інвестиційним проєктом.

***Ключові слова****: обліково-аналітичне забезпечення, управління, управлінський облік, інвестиційний проєкт, управління інвестиційним проєктом*

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**Список літератури**

1. Батаєв С. В., Мельник О. С. Аналіз принципів роботи, переваг та викликів у використанні хмарних технологій в умовах сьогодення. *Вчені записки ТНУ імені В. І. Вернадського. Серія: Технічні науки*. 2024. Том 35 (74). No 3. С. 31–36. https://doi.org/10.32782/2663-5941/2024.3.1/06
2. Василенко В.М., Вакалюк Т.А. Штучний інтелект в управлінні проєктами: аналіз сучасних досліджень та перспектив розвитку. *Вчені записки ТНУ імені В.І. Вернадського. Серія: Технічні науки.* 2024. Том 35 (74). No 4. С. 60-67. https://doi.org/10.32782/2663-5941/2024.4/10
3. Гнилицька Л.В. Обліково-аналітична інформація як визначальний чинник забезпечення економічної безпеки суб'єктів господарювання. *Вісник Східноукраїнського національного університету імені Володимира Даля.* 2011. No3 (157). С. 57-65.
4. Дацун В. В. Інформаційні технології в управлінні інвестиційними проектами. *Вісник Хмельницького національного університету*. 2016. No 5. Т. 2. С. 30-32.

5. Деречин В.В., Ніценко В.С., Сухій Я.В., Чумаченько О.В. Формування облікової політики на підприємстві. *Матеріали П'ятої міжнародної науково-практичної конференції «Ринкова трансформація економіки АПК».* Харків: ХНТУСГ, 2007. С. 194-196.
6. Деркач М. Як штучний інтелект застосовується в інвестиційній сфері - аналітика. *PaySpace Magazine*. 2023. https://psm7.com/uk/technology/iskusstvennyj-intellekt-kak-instrument-dlya-investicij-kak-eto-rabotaet-i-kakie-funkcii-vypolnyaet.html
7. Єршова Н. Облікове та аналітичне забезпечення бюджетування з метою досягнення його гнучкості та виконання контрольної функції в процесі фінансового прогнозування. *Фінансово-кредитні системи: перспективи розвитку.* 2024. № 4(15). С. 43-52. https://doi.org/10.26565/2786-4995-2024-4-04
8. Івата В., Погорєлова О., Бурлан С. Облікове-аналітичне забезпечення бізнес-процесів в умовах економічної нестабільності: ключові аспекти. *Економіка та суспільство*. 2023. №50. https://doi.org/10.32782/2524-0072/2023-50-46
9. Ковальчук С. П. Обліково-аналітичне забезпечення управління інвестиційними проектами підприємства. *Менеджмент та підприємництво: тренди розвитку*. 2019. № 1(07). С. 8-17. https://doi.org/10.26661/2522-1566/2019-1/07-01
10. Крюкова І.О., Ніценко В.С. Обліково-аналітична підтримка ефективного управління земельними ресурсами аграрних бізнес-структур. *Ринкова економіка: сучасна теорія і практика управління*. 2016. Том 15. Вип. 3 (34). С. 7-23.
11. Ларікова Т. В. Формування системи обліково-аналітичного забезпечення управління діяльністю розпорядників бюджетних коштів в умовах сталого розвитку. *Фінанси України*. 2025. № 5. С. 84-97. https://doi.org/10.33763/finukr2025.05.084
12. Македон В.В., Ковнір О.О. Цифрова трансформація процесу управління інвестиційними проектами підприємства. *Держава та регіони. Серія: Економіка та підприємництво.* 2024. №3 (133). С. 76-82. https://doi.org/10.32782/1814-1161/2024-3-11
13. Мачуга Р.І. Інформаційні бухгалтерські системи: функції, мета і завдання. *Вісник Житомирського державного технологічного університету. Серія: Економічні науки.* 2007. 42(4). С. 117-125.
14. Микитюк П., Микитюк Ю. Управління ефективністю інвестиційного проєктування із використанням економіко-математичного моделювання. *Вісник економіки.* 2023. Вип. 1. С. 166–181. https://doi.org/10.35774/visnyk2023.01.166
15. Ніценко В.С. Управлінський облік в системі менеджменту агрохолдингу. *Управління сучасним підприємством: Матеріали VII Міжнарод. наук.-практ. конф.* (Київ, 22-23 березня 2012 р.). К.: НУХТ, 2012. С. 240-241.
16. Пелех У. Обліково-аналітичне забезпечення реалізації стратегічних цілей діяльності підприємства в умовах цифрової економіки. *Економіка та суспільство*. 2022. № 39. https://doi.org/10.32782/2524-0072/2022-39-36
17. Подолянчук О.А. Сутність обліково-аналітичної інформації та її роль в системі внутрішнього контролю сільськогосподарського підприємства. http://repository.vsau.org/getfile.php/2161.pdf
18. Рижикова Н., Бірченко Н., Богомолов О. (2024). Роль обліково-аналітичних систем у забезпеченні інвестиційної безпеки в аграрному секторі України. *Економіка та суспільство*, 68. https://doi.org/10.32782/2524-0072/2024-68-121
19. Сисоєва І., Головай Н., Ціхановська О., Сулько Є., Заїка Є. Сучасні інструменти бухгалтерського обліку та контролю як драйвери ефективності інноваційно-інвестиційної діяльності підприємств. *Modeling the development of the economic systems.* 2024. № 4. С. 258–263. https://doi.org/10.31891/mdes/2024-14-34
20. Тараненко І., Сафонов Д., Дука В. Штучний інтелект і машинне навчання: що відбувається на ринку і які перспективи галузі. 2023. *Speka*. https://speka.media/stucnii-intelekt-i-masinne-navcannya-shho-vidbuvajetsya-na-rinku-i-yaki-perspektivi-galuzi-9qz4g9
21. Чорненька О., Боярчук С. Стратегічний підхід до інформаційно-облікового забезпечення фінансово-економічної безпеки в умовах циркулярної економіки. *Економіка та суспільство*. 2024. №61. https://doi.org/10.32782/2524-0072/2024-61-79
22. Юзва Р. П. Обліково-аналітична система – інформаційне забезпечення управління підприємством. *Облік і фінанси АПК.* 2008. No 11-12 (32–33). С. 90–94.
23. Dmytrenko A.V. Accounting policy as a key tool for achieving financial success and sustainability of a business entity. *Економіка і регіон*. 2024. № 4 (95). С. 178–188. https://doi.org/10.26906/EiR.2024.4(95).3624
24. Iershova N. Y., Lynnyk O. I. Information and accounting support for investment analysis of business for management decision making in industry 4.0. *Bulletin of the National Technical University "KhPI" (economic sciences).* 2021. No 1. pp. 25-31. https://doi.org/10.20998/2519-4461.2021.1.25
25. PMI: Project Management Institute. Shaping the future of project management with AI. 2023. URL: https://www.pmi.org/learning/thought-leadership/ai-impact/shaping-the-future-of-project-management-with-ai
26. Polishchuk I. R., Vyhivska I. M., Makarovych V. K. Accounting and analytical support for managing the reliability of financial reporting indicators. *Проблеми теорії та методології бухгалтерського обліку, контролю і аналізу*. 2022. Вип. 1. С. 17-22. http://dx.doi.org/10.26642/pbo-2022-1(51)-17-22
27. Shubina S., Piskunov R., Nitsenko V., Miroshnyk O., Pelykh D. Accounting and analytical support of the efficiency of fixed assets use in managing the efficiency of business processes of the enterprise. *Financial and Credit Systems: Prospects for Development*. 2025. № 1(16). pp. 88-100. https://doi.org/10.26565/2786-4995-2025-1-07
28. Taylor P. The state of AI in PM: leading project manager unpacks brand new capterra data. *Capterra*. 2023. URL: https://www.capterra.com/resources/data-on-ai-in-project-management/

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# Економіко-математичні методи та моделі фінансового розвитку

# Economic and mathematical methods and models of financial development

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## Modelling financial results based on "green" budgeting principles

***Abstract.*** Contemporary challenges arising from the global environmental crisis, the transition to a low-carbon economy, economic instability and digital transformation necessitate a rethinking of approaches to financial planning in enterprises.

**Problem statement.** Modelling the financial results of enterprises based on the principles of "green" budgeting makes it possible to combine economic goals with environmental and social objectives. Such an approach meets the requirements of ESG standards and the challenges of European integration processes.

**Unresolved aspects of the problem.** Scholarly research focuses on various directions in the development of budgeting: improving enterprise budgeting systems, applying HR- and gender-oriented approaches, integrating instruments of controlling, strategic management, investment project evaluation, crisis management and ensuring financial security.

**Purpose of the article** is to substantiate and develop a model for forecasting an enterprise's financial results, integrated with the principles of "green" budgeting, which ensures a balanced combination of financial goals and environmental standards, promotes resource optimisation, and enhances business competitiveness.

**Presentation of the main material**. The object of the study is the system of strategic financial planning of the enterprise, considered from the perspective of integrating environmentally oriented investments, energy efficiency projects, and the implementation of renewable energy sources into financial strategies.

**Conclusions**. The proposed model provides for the allocation of financial resources with consideration for investments in energy-efficient technologies, decarbonisation projects, the implementation of renewable energy sources, and waste management systems. This contributes to reducing operating costs, optimising resource use, and strengthening the enterprise's environmental reputation. The assessment of financial and economic indicators, taking into account ESG principles, confirmed that "green" budgeting not only improves key financial metrics (profitability, liquidity, asset turnover) but also enhances non-financial indicators related to environmental and social responsibility.

The practical value of the work lies in providing recommendations for integrating "green" budgeting into the strategic management system, which can be used by enterprises across various sectors to improve financial stability, environmental performance, and social responsibility.

The results obtained can serve as a basis for developing sector-specific methodological guidelines and adapting international ESG standards to the realities of the Ukrainian economy.

***Keywords**: modelling, financial results, "green" budgeting, sustainable development, ESG principles, strategic financial planning.*

**JEL Classification**: M 15, M 20, G 30, O 32

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**Introduction**. The current realities of Ukraine's economic development, shaped by military actions, economic instability, and global sustainable development challenges, have significantly complicated the task of ensuring stability and predictability in enterprises' financial outcomes. Traditional methods of financial planning and budgeting no longer guarantee the achievement of planned indicators, as the business environment now requires the integration of environmental, social, and governance (ESG) aspects into operations.

Under martial law and economic turbulence, Ukrainian enterprises face issues such as shrinking sales markets, disruptions to production and logistics chains, fluctuations in resource prices, and rising environmental and social risks. At the same time, the active implementation of "green" budgeting principles creates new opportunities for shaping a positive corporate image, optimising resource use, and enhancing investment attractiveness.

Modelling financial results based on "green" budgeting allows environmental and social priorities to be integrated into an enterprise's financial strategy, ensuring a comprehensive approach to managing profit and expenditure. This approach not only improves the efficiency of financial resource utilisation but also strengthens competitive positions in both domestic and international markets – a factor of particular importance in the context of Ukraine's post-crisis economic recovery.

**Literature review**. The issue of modelling enterprises' financial results based on the principles of "green" budgeting is actively researched by both Ukrainian and international scholars, as it combines the challenges of effective financial planning, resource management, and the implementation of sustainable development strategies.

Among Ukrainian researchers, significant contributions to the development of theoretical and applied aspects of budgeting have been made by Bailova O. O. [1], Blyzniuk K. O. [2], Bondarchuk O. M., Astafieva K. O., Nikulnikova H. V., Astafiev O. Yu. [3], Vyhovska N. H., Polchanov A. Yu., Dovhaliuk V. V. [4], Hrynchyshyn Ya. M., Pylat M. V. [5], Huzar B. S.,

Ptashnyk S. A., Ulianych Yu. V. [6], Dmytriieva M. M. [7], Zhyber T. V., Tymchenko O. M. [9], Zhovnovach R. I., Kovalov D. H., Burlaka V. V. [10], Iierusalymov V. I. [11], Karpushenko M. Yu., Karpushenko O. O. [12], Kozarezenko L. V. [13], Maiorova T. V., Zhyber T. V. [14], Melikhova T. O., Ptitsyna L. A., Trykoz I. V. [15], Osypenko S. M., Zhelnovach O. O., Pysarevskyi S. V. [16], Rudyk N. V. [17], Sviderska I. M., Yurkevych O. M. [18], Trusova N. V., Chkan I. O. [19].

The works of these authors cover a wide range of budgeting issues – from improving enterprise budgeting systems and introducing HR- and gender-oriented budgeting to integrating the principles of "green" budgeting [13] into companies' financial strategies. Much attention is given to combining budget planning with controlling tools [6], strategic management [5], investment project evaluation [4], crisis management [10], and ensuring financial security [19].

An important research direction concerns the impact of "green" budgeting approaches on resource optimisation and the achievement of sustainable development goals. In particular, Kozarezenko L. V. [13] identifies key determinants for implementing "green" budgeting principles, while Maiorova T. V. and Zhyber T. V. [14] analyse prospects for budgeting expenditure in the education sector in the context of ESG benchmarks.

Among international authors whose works address financial results modelling and the improvement of budgeting processes, notable contributions have been made by Bagatska K. [20], Bagatska K., Blakyta H., Melnychuk O., Pashkuda T., Mishchenko A. [21], Fomina O. [22], Fomina O., Semenova S., Moshkovska O., Lositska T. [23], Harafonova O. I. [24], Herasymovych I. A. [25], Kuznetsova I., Karpenko Y. [26], Shevtsiv L. [27], Simakov K., Chernyshova S. [28].

Their research covers balanced budgeting [22; 23], strategic approaches to budgeting [24; 27], the application of budgeting under conditions of innovative transformation [26], and the improvement of management accounting systems based on strategic budgeting [28].

The analysis of academic sources indicates that combining the principles of "green" budgeting with modern approaches to modelling financial results enables enterprises to increase the efficiency of financial resource utilisation, achieve environmental objectives, and strengthen their competitive positions. At the same time, there remains a need for further development of methodological tools that take into account the specifics of Ukrainian enterprises and integrate best international practices in sustainable development, financial management, and digital transformation.

**Purpose, objectives and research methods**. The aim of the study is to substantiate and develop a model for forecasting an enterprise's financial results, integrated with the principles of "green" budgeting, which ensures a balanced combination of financial goals and environmental standards, promotes resource optimisation, and enhances business competitiveness.

The object of the study is the system of strategic financial planning of the enterprise, considered from the perspective of integrating environmentally oriented investments, energy efficiency projects, and the implementation of renewable energy sources into financial strategies.

To achieve the stated aim, the following objectives are addressed:

- to reveal the essence and significance of "green" budgeting as a tool for enhancing an enterprise's financial and environmental performance;
- to examine the impact of environmental and social factors on the financial results of the enterprise;
- to assess the enterprise's financial and economic performance indicators, taking into account ESG principles;
- to develop a model for forecasting the financial results of the enterprise that integrates the principles of "green" budgeting into the strategic planning system.

The study employs a set of scientific research methods, namely: analysis and synthesis – to determine the essence and significance of "green" budgeting; comparative analysis – to identify the impact of environmental and social factors on financial results; financial analysis – to evaluate key performance indicators of LLC "KhSMEP" and identify reserves for improving efficiency;

modelling – to construct a forecasting model of financial results, taking into account ESG principles and "green" budgeting.

**Research Results**. "Green" budgeting is a modern approach to financial planning that integrates economic and environmental priorities into the enterprise's resource allocation process. It involves incorporating the principles of sustainable development and ESG factors into budget formation, enabling financial goals to be achieved without causing harm to the environment.

In practical terms, this approach includes directing investments towards energy-efficient technologies, implementing renewable energy sources, reducing greenhouse gas emissions, optimising resource use, and developing environmentally safe production processes. "Green" budgeting also contributes to enhancing the transparency of financial reporting and improving corporate reputation.

Its significance lies in ensuring a balance between increasing profitability and minimising negative environmental impacts, reducing operating costs through resource savings, and improving competitiveness and the enterprise's long-term financial sustainability. Thus, "green" budgeting serves as a strategic management tool that simultaneously strengthens the financial and environmental performance of the enterprise.

At the present stage, the implementation of "green" budgeting is particularly relevant within the framework of strategic financial planning, which encompasses three interrelated levels:

- long-term (3–5 years) – preparing forecasts of financial statements, cash flows, and the balance sheet;
- current (1 year) – planning income and expenditure by activity type and preparing the balance sheet plan;
- operational (ten-day period, month, quarter) – developing a payment calendar and a cash plan.

Thus, "green" budgeting is integrated across all horizons of financial planning, forming a holistic strategic management system capable of ensuring financial stability, environmental safety, and social responsibility of the enterprise (Table 1).

*Table 1. Types of strategic planning of enterprise financial results within the "green" budgeting system*

| Subsystems of financial results Planning | Types of plans developed | Planning period |
|---|---|---|
| Long-term (strategic) | Forecast profit and loss statement including environmental investments; forecast cash flow incorporating costs/savings from energy-efficient technologies; forecast balance sheet integrating "green" assets | 3-5 years |
| Current | Operating income and expenditure plan taking into account the costs of environmentally friendly materials and energy; investment income and expenditure plan for renewable energy sources and decarbonisation projects; cash inflow and outflow plan with a focus on resource efficiency; balance sheet plan with ESG indicators | 1 year |
| Operational | Payment calendar considering "green" procurement; cash plan with monitoring of environmentally oriented expenditures and resource savings | Ten-day period, month, quarter |

*Source: compiled by the author based on the materials of LLC "Kharkiv Specialised Installation and Maintenance Enterprise", taking into account the principles of green budgeting.*

The calculation and analysis method within the "green" budgeting system involves the use of a base index that reflects changes in a financial indicator during the planning period, taking into account environmental and social factors. The forecast value is then determined by integrating data on environmental project costs, resource efficiency, and energy savings. This method is based on expert assessments and allows for the consideration of ESG factors even in the absence of clear technical and economic standards, using an analysis of the dynamics and interrelationships between financial and environmental indicators.

Modelling financial indicators during the planning stage in the context of 'green' budgeting enables the identification of quantitative relationships between financial results and factors of environmental and social efficiency. This approach improves the accuracy of forecasts and allows for the assessment of the impact of investments in renewable energy sources, decarbonisation measures, and waste management projects on the profitability, liquidity, and stability of the enterprise.

Budget planning under the "green" approach includes the preparation of forecast financial statements based on detailed assumptions regarding assets, liabilities, income, and expenditure, including the allocation of resources into traditional and environmentally targeted categories [2].

An important role is played by supplementary budgets, which integrate operating and investment budgets while accounting for the costs of "green" procurement, energy-efficient technologies, and environmental innovations (Fig. 1).

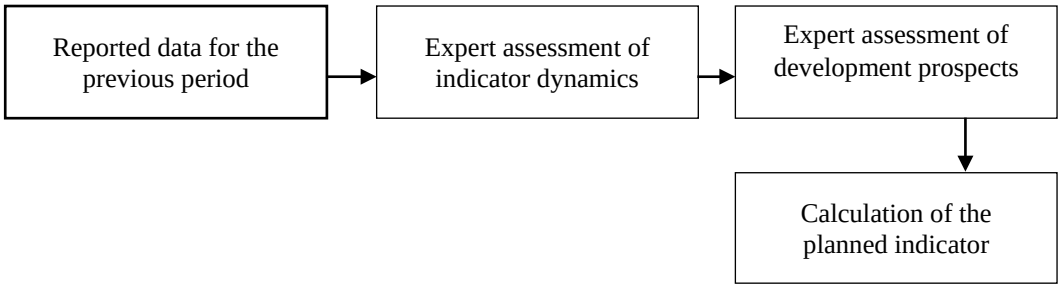


*Fig. 1. Diagram of the calculation and analysis method of planning in the "green" budgeting system*
*Source: compiled by the author based on the materials of LLC "Kharkiv Specialised Installation and Maintenance Enterprise", taking into account the principles of green budgeting*

The main outcomes of this process are:

- recording, analysing, and planning the enterprise's and its units' financial and environmental flows, including the carbon footprint and the use of natural resources;
- maintaining records of income, expenditure, profit, and loss, with a separate allocation for "green" budget items;
- ensuring the enterprise's financial stability, solvency, and environmental responsibility;
- planning tax payments, environmental charges, and benefits;
- defining the terms and opportunities for loan repayment, including "green" financial instruments;
- analysing the dynamics of the enterprise's cash flows and environmental investments, both overall and within individual units [3].

The assessment of financial and environmental plans is carried out through responsibility centres [5], where each unit has its share in the overall "green" budget (Fig. 2).

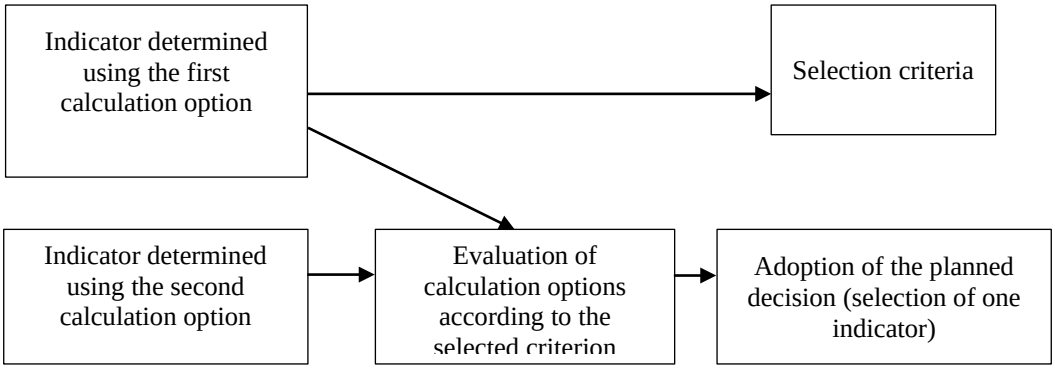


*Fig. 2. Application of the method of optimising planned decisions in the "green" budgeting system*
*Source: compiled by the author based on the materials of LLC "Kharkiv Specialised Installation and Maintenance Enterprise", taking into account the principles of green budgeting*

The calculation of debt repayment is based on data from the "green" procurement plan, multiplied by the price adjusted for the environmental factor (for example, energy efficiency or product certification), which determines the cost of goods. Previous period liabilities are also taken into account, in particular accounts payable for goods, works, and services as of 31 December 2024, which amounted to UAH 4,588.8 thousand.

The presence of significant debt may slow down the receipt of profits from the sale of transformers at the enterprise and reduce the capacity to invest in environmental projects and technologies. This underlines the need for careful expenditure planning, particularly in relation to resource-efficient solutions, and for their continuous comparison with revenues, including "green" income and savings from environmental initiatives (Fig. 3 and Fig. 4).

Fig. 3 presents the budgeting process at the enterprise, developed on the basis of data from LLC "Kharkiv Specialised Installation and Maintenance Enterprise" with the integration of environmental parameters into financial planning. It reflects the stages and main processes of "green" budget planning, which include:

- developing a budget that incorporates environmental goals and indicators;
- approving the plan with a priority on financing sustainable solutions;
- monitoring budget execution with oversight of both financial and environmental performance indicators.

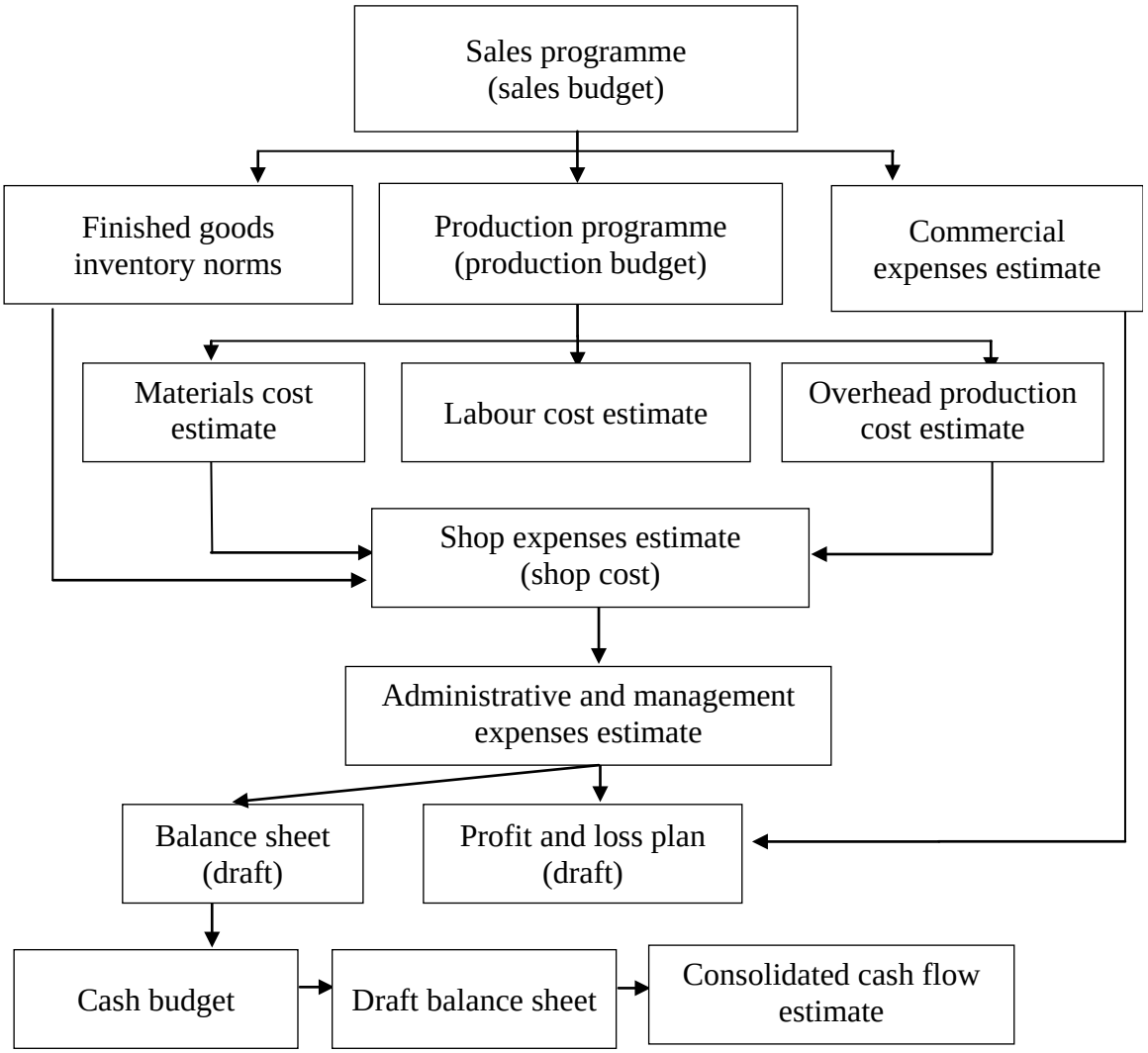


*Fig. 3. "Green" budgeting scheme at the enterprise*
*Source: compiled by the author based on the materials of LLC "Kharkiv Specialised Installation and Maintenance Enterprise", taking into account the principles of green budgeting*

Key elements (Fig. 3) cover the formation of planned financial and environmental indicators, forecasting income and expenditure with the allocation of "green" budget items, identifying key areas for environmentally oriented investment, and establishing mechanisms to control the achievement of planned financial and environmental objectives.

The "green" budgeting system supports the effective management of the enterprise's financial and natural resources, enabling the anticipation of possible deviations in expenditure and income, assessing their impact on environmental outcomes, and ensuring timely budget adjustments. In addition, the diagram illustrates the role of governing bodies in allocating funds for environmental initiatives and the responsibility of departments for their implementation and monitoring.

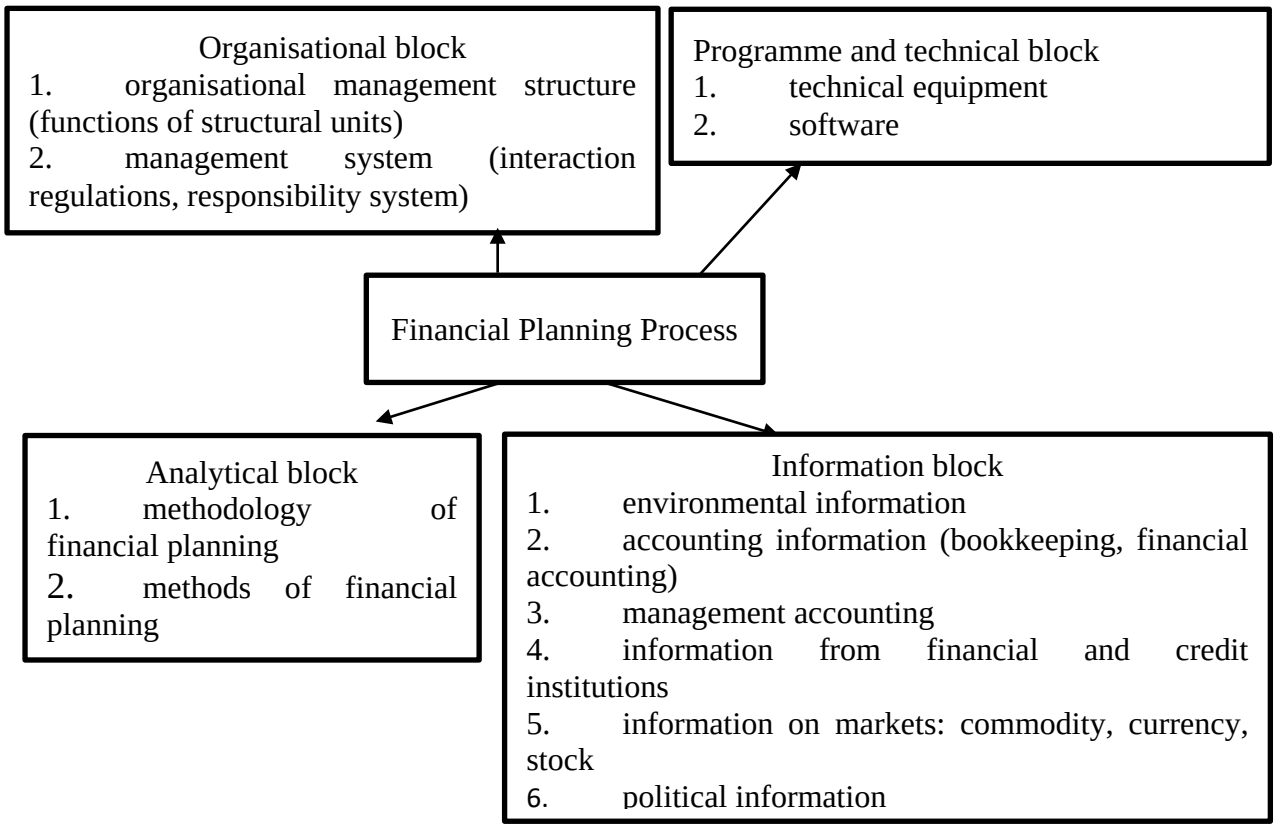


*Fig. 4. Structure of the process of strategic planning of the enterprise's financial and environmental performance*
*Source: compiled by the author based on the materials of LLC "Kharkiv Specialised Installation and Maintenance Enterprise", taking into account the principles of green budgeting*

Fig. 4 illustrates the interconnection between the main stages of strategic planning aimed at achieving the enterprise's long-term financial and environmental objectives. The structure includes:

- analysis of the internal and external environment, taking into account the impact on natural resources and the enterprise's carbon footprint;
- definition of the mission and strategic goals, incorporating environmental priorities and ESG indicators;
- formulation of financial and environmental forecasts (for example, reducing energy consumption, cutting waste, and improving resource efficiency);
- development of strategic plans with priority funding for sustainable projects;
- selection of financial instruments (including "green" bonds, eco-loans, and grants) for plan implementation;

- evaluation of results and adjustment of the strategy based on the achieved financial and environmental KPIs.

The management of the enterprise plays a key role in this process, ensuring a balanced allocation of financial and natural resources, maintaining transparency, and fostering accountability at all levels of governance. Such a structure enhances the enterprise's financial stability and competitiveness while simultaneously reducing its environmental impact and adapting operations to the long-term challenges of sustainable development.

To improve the efficiency of planning, the data are transferred to Table 2, which, in addition to traditional financial indicators, takes into account the costs of purchasing new transformers or reactors with enhanced energy efficiency, introducing new product lines that meet environmental standards, as well as investments in "green" technologies and resource-saving solutions [8].

*Table 2. Schedule of expected revenues for 2024 to LLC "Kharkiv Specialised Installation and Maintenance Enterprise", taking into account environmentally oriented projects, thousand UAH*

| Indicator | Quarter | | | | Total for the year | Share of "green" revenues, % | Savings from energy efficiency, thousand UAH | Environmental effect, t $CO_2$ reduction |
|---|---|---|---|---|---|---|---|---|
| Accounts receivable | 1 | 2 | 3 | 4 | | | | |
| Realisation in Q1 | | | | | | | | |
| 60% | 600.00 | | | | 600.00 | 25 | 30.00 | 12.0 |
| 40% | | 400.00 | | | 400.00 | 20 | 20.00 | 8.0 |
| Realisation in Q2 | | | | | | | | |
| 60% | | 523.74 | | | 523.74 | 28 | 26.20 | 10.5 |
| 40% | | | 349.16 | | 349.16 | 22 | 17.46 | 7.2 |
| Realisation in Q3 | | | | | | | | |
| 60% | | | 498.64 | | 498.64 | 30 | 24.93 | 9.9 |
| 40% | | | | 332.43 | 332.43 | 25 | 16.62 | 7.8 |
| Realisation in Q4 | | | | | | | | |
| 60% | | | | 893.35 | 893.35 | 35 | 44.67 | 17.9 |

Table 2 presents the schedule of expected revenues for 2024 for LLC "Kharkiv Specialised Installation and Maintenance Enterprise", highlighting the share of "green" revenues associated with environmentally oriented projects, energy-efficient technologies, and products that comply with sustainable development standards. The allocation of cash flows by month makes it possible not only to monitor planned financial inflows throughout the year but also to analyse the dynamics of environmental investments and their impact on the enterprise's financial stability.

Each month shows the expected amount of revenue, including the share of "green" funds, enabling management to assess the enterprise's financial and environmental capacity at different periods of the year. This supports more accurate planning of expenditure on the implementation of resource-efficient technologies, ensures the stability of cash flows, and facilitates the timely fulfilment of financial and environmental obligations.

In addition, the schedule helps identify periods of potential growth or decline in revenues, including "green" revenues, allowing timely decisions to be made on optimising the use of financial and natural resources. In our view, Table 2 is an important element of managing the enterprise's financial and environmental strategy, as it serves as a basis for developing measures to adjust the budget, financial plans, and sustainable development programmes in the event of deviations from projected indicators.

Table 3 presents the repayment schedule for the enterprise's trade payables, taking into account the environmental aspects of procurement, which makes it possible to assess the impact of the debt structure on the ability to finance "green" investments.

*Table 3. Repayment schedule for trade payables of LLC "Kharkiv Specialised Installation and Maintenance Enterprise" for 2024, thousand UAH, taking into account "green" procurement*

| Indicator | Quarter | | | | Total for the year |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| Accounts payable as at 01 January 2025 | 4,588.80 | | | | 4,588.80 |
| Realisation in Q1 | | | | | |
| 40% | 1,601.81 | | | | 1,601.81 |
| 60% | | 2,402.71 | | | 2,402.71 |
| Realisation in Q2 | | | | | |
| 40% | | 1,408.09 | | | 1,408.09 |
| 60% | | | 2,112.13 | | 2,112.13 |
| Realisation in Q3 | | | | | |
| 40% | | | 1,345.51 | | 1,345.51 |
| 60% | | | | 2,018.26 | 2,018.26 |
| Realisation in Q4 | | | | | |
| 40% | | | | 2,445.80 | 2,445.80 |

*Source: compiled by the author based on the materials of LLC "Kharkiv Specialised Installation and Maintenance Enterprise", taking into account the principles of green budgeting.*

The costs of purchasing goods are allocated among different product items in accordance with the debt repayment schedule (Table 4), with a separate allocation for purchases that meet the criteria of "green" procurement – energy-efficient equipment, materials with a low carbon footprint, and products manufactured in compliance with environmental standards.

Transport and procurement costs are calculated as 7% of the cost of goods, in line with the enterprise's logistics standards, and include measures to improve the environmental efficiency of transportation: route optimisation, the use of low-emission vehicles, and the reduction of empty runs.

The total amount of transport and procurement costs, together with purchasing expenses, forms the environmentally adjusted cost of goods, which takes into account not only financial indicators but also environmental aspects. This approach aligns with green budgeting principles and supports the achievement of the enterprise's strategic sustainable development goals.

Social security contributions are calculated as 36.2% of the enterprise's payroll fund and are allocated among product items in proportion to labour costs [9]. Within the green budgeting system, this allocation may also take into account the environmental component of the units' activities – for example, additional incentives for employees involved in the implementation of "green" projects.

Taking into account the above budgets and the planned changes in expenditure by item (which require more detailed planning), the chief accountant prepares the income and expenditure budget, which includes both traditional financial indicators and sustainable development metrics. This enables the comparison of the enterprise's total income with the costs incurred, in particular those related to the implementation of energy-efficient solutions, environmental technologies, and emission reductions.

When planning indirect costs, it is important to analyse past trends and consider the impact of environmental measures on their structure. For example, in 2024 the depreciation rate in turnover was 0.14%, while the rate of other operating expenses was 20.9%. In 2025, it is planned to reduce the latter to 10.9%, partly due to energy-saving technologies and reduced resource costs.

The enterprise's performance in the context of green budgeting is also reflected in profitability indicators that take into account the economic effect of environmental investments. Analysis has shown that the enterprise will continue to operate with positive profitability and gradually increase it, partly by reducing exposure to environmental risks.

*Table 4. Budget of commercial expenses of LLC "Kharkiv Specialised Installation and Maintenance Enterprise" for 2024, thousand UAH, taking into account the principles of green budgeting*

| Indicator | Q1 | Q2 | Q3 | Q4 | Total for the year |
|---|---|---|---|---|---|
| Sales volume, UAH | 5,838,951.7 | 5,278,526.6 | 5,034,137.1 | 9,004,244.0 | 25,155,859.4 |
| Share of "green" sales, % | 18 | 20 | 22 | 25 | - |
| Variable selling expenses, UAH | 408,726.6 | 369,496.9 | 352,389.6 | 630,297.1 | 1,760,910.2 |
| Additional expenses | 9,800.0 | 7,570.0 | 1,500.0 | 1,500.0 | 20,370.0 |
| Purchasing costs of goods | 6,190,609.5 | 3,810,800.2 | 3,457,635.1 | 4,464,063.2 | 17,923,108.1 |
| incl. "green" procurement, % | 15 | 18 | 20 | 22 | - |
| Transport and procurement costs | 465,959.9 | 286,834.4 | 260,252.1 | 336,004.8 | 1,349,051.2 |
| incl. environmentally optimised, % | 10 | 12 | 15 | 18 | - |
| Cost of works provided | 6,656,569.4 | 4,097,634.7 | 3,717,887.2 | 4,800,068.0 | 19,272,159.3 |
| Material costs | - | 10.3 | - | - | 10.3 |
| Labour costs | 76,840.1 | 77,228.8 | 77,247.4 | 84,952.5 | 316,268.8 |
| Social security contributions | 27,816.1 | 27,956.8 | 27,963.6 | 30,752.8 | 114,489.3 |
| Depreciation | 8,174.5 | 7,389.9 | 7,047.8 | 12,605.9 | 35,218.2 |
| Other operating expenses | 636,445.7 | 575,359.4 | 548,720.9 | 981,462.6 | 2,741,988.7 |
| Total expenses, UAH | 7,824,372.5 | 5,162,646.8 | 4,732,756.6 | 6,541,638.9 | 24,261,414.7 |

Given the specifics of the sector, it should be noted that the introduction of a budgeting system adapted to green budgeting at LLC "Kharkiv Specialised Installation and Maintenance Enterprise" will allow the enterprise to:

- more accurately justify the calculation of prices for works provided, taking into account the environmental cost of resources;
- plan and optimise expenditure in line with environmental protection requirements;
- improve resource efficiency and reduce both direct and indirect losses.

The overall effect of integrating the "green" budget planning system is estimated at no less than 32-33% of sales volume, with a significant proportion of savings generated through reduced energy consumption, optimised logistics, and the implementation of resource-efficient technologies.

**Discussion**. The results of the study confirmed the appropriateness of integrating the principles of green budgeting into the financial planning system of enterprises, which is consistent with the findings of Ukrainian and international scholars (L. V. Kozarezenko [13], T. V. Maiorova, T. V. Zhyber [14], K. Bagatska [20], O. Fomina [22]). The proposed model demonstrates that combining financial, environmental and social priorities provides a more comprehensive understanding of an enterprise's financial outcomes and allows for greater forecasting accuracy.

Compared with traditional approaches to budgeting, which focus primarily on financial indicators, the proposed system also incorporates environmental indicators and social effects. This broadens the possibilities for strategic management and aligns with the modern requirements of ESG-oriented business. At the same time, unlike studies that concentrate solely on HR- or gender-oriented budgeting, our research emphasises the interconnection between environmental innovations, financial performance and corporate social responsibility.

It is important to note that the results confirm the economic feasibility of investing in green technologies, as such expenditures contribute not only to reducing costs and optimising resource use, but also to enhancing corporate reputation. This conclusion coincides with the position of international researchers (O. Fomina, S. Semenova, O. Moshkovska, T. Lositska [23]; L. Shevtsiv [27]) on the role of sustainable budgeting in management accounting and the strategic development of companies.

However, the study also revealed a number of limitations. In particular, the model was tested on the example of a single enterprise, which may complicate its universalisation. In addition, reliance on the quality of statistical data and the accuracy of expert assessments creates risks of subjectivity in forecasts. This necessitates testing the model in different sectors of the economy, as well as incorporating international experience.

**Conclusions**. The study confirmed that modelling an enterprise's financial results with the integration of "green" budgeting principles is an effective tool for ensuring sustainable development and enhancing competitiveness in the context of global challenges and the transition to a low-carbon economy. This approach combines financial and environmental priorities, ensuring a balance between increasing profitability and minimising negative environmental impacts.

The proposed model provides for the allocation of financial resources with consideration for investments in energy-efficient technologies, decarbonisation projects, the implementation of renewable energy sources, and waste management systems. This contributes to reducing operating costs, optimising resource use, and strengthening the enterprise's environmental reputation. The assessment of financial and economic indicators in line with ESG principles confirmed that "green" budgeting not only improves key financial metrics (profitability, liquidity, asset turnover) but also enhances non-financial indicators related to environmental and social responsibility and the quality of corporate governance.

Modelling made it possible to account for the impact of environmental and social factors in forecast calculations, to develop scenarios with varying levels of resource efficiency and environmental impact, thereby increasing the accuracy of strategic planning and enabling the timely adaptation of financial policy to changes in the external environment, regulatory requirements, and stakeholder needs. Thus, the integration of 'green' budgeting principles into financial planning establishes a comprehensive management system capable of ensuring the enterprise's financial stability, environmental safety, and social responsibility in the long term.

Further scientific research should be directed towards deepening the theoretical and applied aspects of integrating "green" budgeting principles into the strategic management system, taking into account financial, environmental, and social priorities. A promising area is the development of advanced economic and mathematical forecasting models that comprehensively assess the impact of environmental innovations and "green" investments on financial results in the short, medium, and long term.

An important task will be the adaptation of the "green" budgeting model to sector-specific characteristics and enterprise scales, the creation of standard methodological guidelines for ESG-oriented financial planning, as well as the analysis of the impact of regulatory initiatives and international sustainable development standards on budgeting processes. Additional attention should be given to examining the economic feasibility of integrating "green" financing instruments into corporate strategies.

The testing of the model across different sectors of Ukraine's economy and beyond will make it possible to identify best practices and develop universal approaches to improving the financial efficiency and environmental performance of enterprises in the context of global challenges, digitalisation, and the transition to a low-carbon economy.

**References**

1. Bailova O. O. (2023) Improving the budgeting system at an enterprise. Efficient Economy, (7). DOI: http://doi.org/10.32702/2307-2105.2023.7.54 [in Ukrainian]
2. Blyzniuk K. O. (2023) Budgeting of foreign economic expenses as a component of financial planning at an enterprise. Efficient Economy, (8). DOI: http://doi.org/10.32702/2307-2105.2023.8.37 [in Ukrainian]
3. Bondarchuk O. M., Astafieva K. O., Nikulnikova H. V., Astafiev O. Yu. (2023) HR budgeting as a tool for personnel management. International Scientific Journal "Internauka". Series: Economic Sciences, 4(1), pp. 45-51. DOI: http://doi.org/10.25313/2520-2294-2023-4-8800 [in Ukrainian]
4. Vyhovska N. H., Polchanov A. Yu., Dovhaliuk V. V. (2023) Budgeting of expenditures for exploration and evaluation of mineral reserves. Investments: Practice and Experience, (1), pp. 5-10. DOI: https://doi.org/10.32702/2306-6814.2023.1.5 [in Ukrainian]
5. Hrynchyshyn Ya. M., Pylat M. V. (2023) Budgeting as a direction for improving the management system of modern enterprises. Investments: Practice and Experience, (2), pp. 53-59. DOI: http://doi.org/10.32702/2306-6814.2023.2.53 [in Ukrainian]
6. Huzar B. S., Ptashnyk S. A., Ulianych Yu. V. (2023) Budgeting as an effective tool for organising financial controlling at enterprises of Ukraine. Collection of Scientific Works of Uman National University of Horticulture, 102(2), pp. 167-181. DOI: http://doi.org/10.32782/2415-8240-2023-102-2-167-181 [in Ukrainian]
7. Dmytriieva M. M. (2023) Participatory budgeting as a tool for financing general secondary education. Educational Analytics of Ukraine, (5), pp. 31-46. DOI: http://doi.org/10.32987/2617-8532-2023-5-31-46 [in Ukrainian]
8. Dovhopol N. V., Ihumentseva N. V., Peresada O. V., Krasnoshchok V. I. (2023) Investment project management paradigm: budgeting challenges. Finance. Law, (12), pp. 69-72. https://doi.org/10.37634/efp.2023.12.13
9. Zhyber T. V., Tymchenko O. M. (2023) Conceptualisation of budgeting in the paradigm of institutionalism. Finance of Ukraine, (8), pp. 113-128. DOI: https://doi.org/10.33763/finukr2023.08.113 [in Ukrainian]
10. Zhovnovach R. I., Kovalov D. H., Burlaka V. V. (2023) Accounting and analytical support for anti-crisis management of agricultural enterprises based on budgeting. Economic Bulletin of Donbas, (2), pp. 26-33. DOI: https://doi.org/10.12958/1817-3772-2023-2(72)-26-33 [in Ukrainian]
11. Iyerusalimov V. I. (2023) The role of gender budgeting in ensuring socio-economic development of society. Economics and Management, (4), pp. 73-78. DOI: http://doi.org/10.36919/2312-7812.4.2023.73 [in Ukrainian]
12. Karpushenko M. Yu., Karpushenko O. O. (2023) Features of budgeting in IT companies. Business Inform, (12), pp. 271-277. DOI: https://doi.org/10.32983/2222-4459-2023-12-271-277 [in Ukrainian]
13. Kozarezenko L. V. (2023) Determinants of the implementation of the principles of "green" budgeting. Economic Bulletin of the University, (56), pp. 174-182. DOI: https://doi.org/10.31470/2306-546X-2023-56-174-182 [in Ukrainian]
14. Maiorova T. V., Zhyber T. V. (2023) Prospects for budgeting of higher education expenditures in Ukraine in the context of sustainable development. Efficient Economy, (5). DOI: http://doi.org/10.32702/2307-2105.2023.5.18 [in Ukrainian]
15. Melikhova T. O., Ptitsyna L. A., Trykoz I. V. (2023) Improvement of accounting, taxation and salary control for the purposeof business planning and budgeting for accounting and analytical supportof startups and calculation of the economic efficiency of its impact on theresults of the enterprise. Agrosvit, (24), pp. 34-41. https://doi.org/10.32702/2306-6792.2023.24.34 [in Ukrainian]
16. Osypenko S. M., Zhelnovach O. O., Pysarevskyi S. V. (2023) Application of the performance-based budgeting method in the management of a military unit. Honour and Law, (2), pp. 91-96. DOI: https://doi.org/10.33405/2078-7480/2023/2/85/282622 [in Ukrainian]
17. Rudyk N. V. (2023) Programme-targeted budgeting at the level of local budgets for sustainable community development. Investments: Practice and Experience, (11), pp. 44-51. DOI: http://doi.org/10.32702/2306-6814.2023.11.44 [in Ukrainian]
18. Sviderska I. M., Yurkevych O. M. (2023) Financial forecasting and budgeting of corporate enterprises under macroeconomic volatility. Efficient Economy, (8). DOI: http://doi.org/10.32702/2307-2105.2023.8.10 [in Ukrainian]
19. Trusova N. V., Chkan I. O. (2023) Development of gender budgeting in Ukraine: A tool of financial security in the conditions of armed conflict. Business Inform, (11), pp. 266-271. DOI: https://doi.org/10.32983/2222-4459-2023-11-266-271 [in Ukrainian]
20. Bagatska K. (2023) Criteria for the expediency of budget support for municipal-owned enterprises. Scientia Fructuosa, (2), pp. 67-77. DOI: http://doi.org/10.31617/1.2023(148)07 [in Ukranian]
21. Bagatska K., Blakyta H., Melnychuk O., Pashkuda T., Mishchenko A. (2023) The impact of budget financing on the performance of municipal-owned enterprises: case of Kyiv City. Financial and Credit Activity: Problems of Theory and Practice, (3), pp. 116-126. DOI: http://doi.org/10.55643/fcaptp.3.50.2023.4060 [in Ukranian]
22. Fomina O. (2021) Balance budgeting of agribusiness enterprises. Herald of Kyiv National University of Trade and Economics, (6), pp. 112-121. DOI: http://doi.org/10.31617/visnik.knute.2021(140)09
23. Fomina O., Semenova S., Moshkovska O., Lositska T. (2021) Balance sheet budgeting at agricultural enterprises. Financial and Credit Activity: Problems of Theory and Practice, (4), pp. 121-129. Retrieved from: http://nbuv.gov.ua/UJRN/Fkd_2021_4_15 [in Ukranian]
24. Harafonova O. I. (2017) Strategic approach to the mechanism of budgeting in financial planning of agricultural enterprises. Scientific Bulletin of Polissia, 1(2), pp. 122-127. Retrieved from: http://nvp.stu.cn.ua/article/view/102201

25. Herasymovych I. A. (2015) Budgeting of business processes – the basis of financial engineering and operating activities of an enterprise. Independent Auditor, (14), pp. 54-58. Retrieved from: http://nbuv.gov.ua/UJRN/Na_2015_14_9
26. Kuznetsova I., Karpenko Y. (2018) The technology of budgeting enterprises with a divisional structure. Current State of Scientific Research and Technology in Industry, (1), pp. 96-102. DOI: https://doi.org/10.30837/2522-9818.2018.3.096
27. Shevtsiv L. (2017) Investigation of the mechanism of interrelation between accounting and budgeting in the enterprise management system: the strategic aspect. Technology Audit and Production Reserves, 6(4), pp. 39-47. DOI: https://doi.org/10.15587/2312-8372.2017.119845
28. Simakov K., Chernyshova S. (2020) Improving the management accounting system through strategic budgeting in an industrial enterprise. Economic Herald of Donbas, (4), pp. 78-84. DOI: https://doi.org/10.12958/1817-3772-2020-4(62)-78-84 [in Ukranian]
29. (2025) Official website of YouControl. Retrieved from: https://youcontrol.com.ua/ru/catalog/company_details/39425391. [in Ukranian]

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**Моделювання фінансових результатів на основі принципів «зеленого» бюджетування**

***Анотація.*** Сучасні виклики, зумовлені глобальною екологічною кризою, переходом до низьковуглецевої економіки, економічною нестабільністю та цифровою трансформацією, вимагають переосмислення підходів до фінансового планування підприємств.

**Постановка проблеми**. Моделювання фінансових результатів підприємств на основі принципів «зеленого» бюджетування дає змогу поєднати економічні цілі з екологічними та соціальними орієнтирами. Такий підхід відповідає вимогам ESG-стандартів і викликам євроінтеграційних процесів.

**Нерозв'язані аспекти**. Наукові дослідження зосереджуються на різних напрямах розвитку бюджетування: удосконаленні його систем на підприємствах, застосуванні HR- та гендерно-орієнтованого підходів, інтеграції інструментів контролінгу, стратегічного управління, оцінки інвестиційних проєктів, антикризового менеджменту та забезпечення фінансової безпеки.

**Мета статті** полягає в обґрунтуванні та розробці моделі прогнозування фінансових результатів підприємства, інтегрованої з принципами «зеленого» бюджетування, яка забезпечує збалансоване поєднання фінансових цілей і екологічних стандартів, сприяє оптимізації використання ресурсів та підвищенню конкурентоспроможності бізнесу.

**Основний матеріал.** Об'єктом дослідження виступає система стратегічного фінансового планування підприємства, що розглядається з позицій інтеграції екологічно орієнтованих інвестицій, проєктів з енергоефективності та впровадження відновлюваних джерел енергії у фінансові стратегії.

**Висновки.** Проведене дослідження підтвердило, що моделювання фінансових результатів підприємства з інтеграцією принципів «зеленого» бюджетування є дієвим інструментом забезпечення сталого розвитку та підвищення конкурентоспроможності в умовах глобальних викликів і переходу до низьковуглецевої економіки. Такий підхід поєднує фінансові та екологічні пріоритети, забезпечуючи баланс між зростанням прибутковості та мінімізацією негативного впливу на довкілля.

Запропонована модель передбачає розподіл фінансових ресурсів з урахуванням інвестицій в енергоефективні технології, проєкти з декарбонізації, впровадження відновлюваних джерел енергії та системи

управління відходами. Це сприяє зниженню операційних витрат, оптимізації використання ресурсів і зміцненню екологічної репутації підприємства. Оцінка фінансово-економічних показників з урахуванням принципів ESG підтвердила, що «зелене» бюджетування не лише покращує ключові фінансові метрики (рентабельність, ліквідність, оборотність активів), але й підвищує нефінансові індикатори, пов'язані з екологічною та соціальною відповідальністю, а також якістю корпоративного управління.

Практична цінність роботи полягає у наданні рекомендацій щодо інтеграції «зеленого» бюджетування в систему стратегічного управління, що може бути використано підприємствами різних галузей для підвищення фінансової стабільності, екологічної результативності та соціальної відповідальності.

Отримані результати можуть слугувати основою для розробки галузевих методичних рекомендацій та адаптації міжнародних стандартів ESG до умов української економіки.

***Ключові слова:*** *моделювання, фінансові результати, «зелене» бюджетування, сталий розвиток, ESG-принципи, стратегічне фінансове планування.*

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**Список літератури**

1. Байлова О. О. Вдосконалення системи бюджетування на підприємстві. Ефективна економіка. 2023. № 7. DOI: http://doi.org/10.32702/2307-2105.2023.7.54
2. Близнюк К. О. Бюджетування зовнішньоекономічних витрат як складова фінансового планування на підприємстві. Ефективна економіка. 2023. № 8. DOI: http://doi.org/10.32702/2307-2105.2023.8.37
3. Бондарчук О. М., Астаф'єва К. О., Нікульнікова Г. В., Астаф'єв О. Ю. HR-бюджетування як інструмент управління персоналом. Міжнародний науковий журнал «Інтернаука». Серія: Економічні науки. 2023. Т. 4, № 1. С. 45-51. DOI: http://doi.org/10.25313/2520-2294-2023-4-8800
4. Виговська Н. Г., Полчанов А. Ю., Довгалюк В. В. Бюджетування видатків на розвідку та оцінку запасів корисних копалин. Інвестиції: практика та досвід. 2023. № 1. С. 5-10. DOI: https://doi.org/10.32702/2306-6814.2023.1.5
5. Гринчишин Я. М., Пилат М. В. Бюджетування як напрям удосконалення системи управління діяльністю сучасних підприємств. Інвестиції: практика та досвід. 2023. № 2. С. 53-59. DOI: http://doi.org/10.32702/2306-6814.2023.2.53
6. Гузар Б. С., Пташник С. А., Уланич Ю. В. Бюджетування як ефективний інструмент організації фінансового контролінгу на підприємствах України. Збірник наукових праць Уманського національного університету садівництва. 2023. Т. 102, № 2. С. 167-181. DOI: http://doi.org/10.32782/2415-8240-2023-102-2-167-181
7. Дмитрієва М. М. Партисипативне бюджетування як інструмент фінансування загальної середньої освіти. Освітня аналітика України. 2023. № 5. С. 31-46. DOI: http://doi.org/10.32987/2617-8532-2023-5-31-46
8. Довгопол Н. В., Ігуменцева Н. В., Пересада О. В., Краснощок В. І. Парадигма менеджменту інвестиційного проєкту: виклики бюджетування. Економіка. Фінанси. Право. 2023. № 12. С. 69-72. https://doi.org/10.37634/efp.2023.12.13.
9. Жибер Т. В., Тимченко О. М. Концептуалізація бюджетування в парадигмі інституціоналізму. Фінанси України. 2023. № 8. С. 113-128. DOI: https://doi.org/10.33763/finukr2023.08.113
10. Жовновач Р. І., Ковальов Д. Г., Бурлака В. В. Обліково-аналітичне забезпечення антикризового управління сільськогосподарськими підприємствами на засадах бюджетування. Економічний вісник Донбасу. 2023. № 2. С. 26-33. DOI: https://doi.org/10.12958/1817-3772-2023-2(72)-26-33
11. Ієрусалимов В. І. Роль гендерного бюджетування у забезпеченні соціально-економічного розвитку суспільства. Економіка і управління. 2023. № 4. С. 73-78. DOI: http://doi.org/10.36919/2312-7812.4.2023.73
12. Карпушенко М. Ю., Карпушенко О. О. Особливості бюджетування в IT-компаніях. Бізнес Інформ. 2023. № 12. С. 271-277. DOI: https://doi.org/10.32983/2222-4459-2023-12-271-277
13. Козарезенко Л. В. Детермінанти реалізації принципів «зеленого» бюджетування. Економічний вісник університету. 2023. № 56. С. 174-182. https://doi.org/10.31470/2306-546X-2023-56-174-182
14. Майорова Т. В., Жибер Т. В. Перспективи бюджетування видатків на вищу освіту України у контексті сталого розвитку. Ефективна економіка. 2023. № 5. DOI: http://doi.org/10.32702/2307-2105.2023.5.18 (in Ukrainian)
15. Меліхова Т. О., Птіцина Л. А., Трикоз І. В. Удосконалення обліку, оподаткування та контролю заробітної плати з метою проведення бізнес-планування та бюджетування для обліково-аналітичного забезпечення стартапів та розрахунок економічної ефективності її впливу на результати роботи підприємства. Агросвіт. 2023. № 24. С. 34-41. https://doi.org/10.32702/2306-6792.2023.24.34
16. Осипенко С. М., Желновач О. О., Писаревський С. В. Застосування методу бюджетування, орієнтованого на результат, в управлінні діяльністю військової частини. Честь і закон. 2023. № 2. С. 91-96. DOI: https://doi.org/10.33405/2078-7480/2023/2/85/282622
17. Рудик Н. В. Програмно-цільове бюджетування на рівні місцевих бюджетів для сталого розвитку громад. Інвестиції: практика та досвід. 2023. № 11. С. 44-51. DOI: http://doi.org/10.32702/2306-6814.2023.11.44
18. Свідерська І. М., Юркевич О. М. Фінансове прогнозування і бюджетування корпоративних підприємств за умов макроекономічної волатильності. Ефективна економіка. 2023. № 8. DOI: http://doi.org/10.32702/2307-2105.2023.8.10
19. Трусова Н. В., Чкан І. О. Розвиток гендерного бюджетування в Україні: інструмент фінансової безпеки в умовах збройного конфлікту. Бізнес Інформ. 2023. № 11. С. 266-271. DOI: https://doi.org/10.32983/2222-4459-2023-11-266-271

20. Bagatska K. Criteria for the expediency of municipal-owned enterprises budget support. Scientia Fructuosa. 2023. No. 2. Pp. 67-77. DOI: http://doi.org/10.31617/1.2023(148)07
21. Bagatska K., Blakyta H., Melnychuk O., Pashkuda T., Mishchenko A. The impact of budget financing on the municipal-owned enterprises performance: case of Kyiv City. Financial and Credit Activity: Problems of Theory and Practice. 2023. No. 3. Pp. 116-126. DOI: http://doi.org/10.55643/fcaptp.3.50.2023.4060
22. Fomina O. Balance budgeting of agribusiness enterprises. Herald of Kyiv National University of Trade and Economics. 2021. No. 6. Pp. 112-121. DOI: http://doi.org/10.31617/visnik.knute.2021(140)09
23. Fomina O., Semenova S., Moshkovska O., Lositska T. Balance sheet budgeting at agricultural enterprises. Financial and Credit Activity: Problems of Theory and Practice. 2021. No. 4. Pp. 121-129. URL: http://nbuv.gov.ua/UJRN/Fkd_2021_4_15.
24. Harafonova O. I. Strategic approach to mechanism of budgeting in financial planning of agricultural enterprises. Scientific Bulletin of Polissia. 2017. Vol. 1, No. 2. Pp. 122-127. URL: http://nvp.stu.cn.ua/article/view/102201.
25. Herasymovych I. A. Budgeting of business processes – the basis of financial engineering and operating activities of an enterprise. Independent Auditor. 2015. No. 14. Pp. 54-58. URL: http://nbuv.gov.ua/UJRN/Na_2015_14_9.
26. Kuznetsova I., Karpenko Y. The technology of budgeting enterprises with the divisional structure. Current State of Scientific Research and Technology in Industry. 2018. No. 1. Pp. 96-102. DOI: https://doi.org/10.30837/2522-9818.2018.3.096
27. Shevtsiv L. Investigation of the mechanism of interrelation between accounting and budgeting in the enterprise management system: the strategic aspect. Technology Audit and Production Reserves. 2017. Vol. 6, No. 4. Pp. 39-47. DOI: https://doi.org/10.15587/2312-8372.2017.119845
28. Simakov K., Chernyshova S. Improving the management accounting system through strategic budgeting in an industrial enterprise. Economic Herald of Donbas. 2020. No. 4. Pp. 78-84. DOI: https://doi.org/10.12958/1817-3772-2020-4(62)-78-84
29. Офіційний сайт YouControl. URL https://youcontrol.com.ua/ru/catalog/company_details/39425391

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# SWOT analysis of the international freight road transport sector of Ukraine

***Abstract.*** In ensuring the free movement of goods between Ukraine and its external partners, in particular the EU, the sphere of international freight road transportations of Ukraine plays an important role.

**Problem statement.** SWOT analysis can be used to study its external and internal environment.

**Unresolved aspects.** A SWOT analysis matrix of the sphere of international freight road transportations of Ukraine has been constructed.

**Purpose of the article.** The purpose of the article is to identify the strengths and weaknesses, as well as opportunities and threats of the sphere of international freight road transportations of Ukraine.

**Main material.** A number of important advantages have been identified: convenient geographical location of the state; extensive network of highways; experienced carriers; competitive cost of services; access to European markets. A number of weaknesses have been identified: unsatisfactory condition of a significant part of the infrastructure; shortage of qualified drivers; difficulties with processing documents and obtaining permits for international transportations; technical condition of the fleet; low level of digitalization; corruption.

The following opportunities have been identified: expanding cooperation with the EU; investments in modernization; growing demand for transportations; integration with new markets in Central Asia, the Caucasus, and the Middle East; introduction of innovations. Certain threats have been identified: military operations on the territory of the state; increased competition from carriers from neighboring countries; lack of sufficient funding to comply with EU environmental standards; economic instability; restrictions on border crossing.

**Conclusions.** For the further development of the international freight road transportations sector in Ukraine, it is advisable to apply the “Mini-Maxi” strategy, which is aimed at minimizing internal weaknesses based on the use of external opportunities.

***Keywords:*** *international road freight transportation, Ukraine, EU, SWOT analysis, strengths, weaknesses, opportunities, threats, strategy.*

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**Introduction.** The international road freight transportations sector of Ukraine plays an important role in ensuring the free movement of goods between Ukraine and its external partners, in particular the countries of the European Union (EU), and contributes to the development of trade and economic growth of the state. In December 2024, the Cabinet of Ministers of Ukraine approved the National Transport Strategy of Ukraine for the period until 2030 and approved the operational plan of measures for its implementation in 2025–2027. The strategy defines the following four main goals:

1. Restoration and development of a competitive and efficient transport system integrated into the trans-European transport network, in accordance with EU policies and standards.

2. Ensuring high-quality passenger transportations and seamless mobility.

3. Safe, people-centric, environmentally friendly and energy-efficient transport with a focus on decarbonization.

4. Achieving institutional capacity, developing human capital and ensuring effective management in the transport sector [4, p. 8].

For each goal, problems are detailed, tasks are formulated, and expected results are indicated. As we can see, this document, among other things, reflects the weaknesses and opportunities of the transport sector of Ukraine, including international road freight transportations.

**Literature review.** SWOT analysis was applied to the sphere of transport and transportations by the following domestic scientists: I. S. Vedmid – studied the strengths and weaknesses, threats and opportunities of freight transportations by railway transport of Ukraine as the most profitable, but unstable link in the railway industry [19]; O. O. Karas & R. S. Buhaievskyi – highlighted theoretical, methodological and practical approaches to the application of SWOT analysis in the study of the transport services market [7]; A. Novikova et al. – carried out a SWOT analysis of the country's transport sector as a component of the national economic system [15]; O. V. Sementsova & Yu. O. Krykhtina – identified directions for increasing the competitiveness of railway passenger transportations based on a SWOT analysis of their competitive positions [16]; L. V. Shkulipa – carried out a SWOT analysis of the feasibility of restructuring the railway transport of Ukraine [17]. As we can see, part of these studies is devoted to the analysis of railway transport performance indicators, part to the country's transport sector.

In turn, foreign scholars focused their attention on the following aspects: L. Bremer & E. Kassens-Noor – analysis of three electric drive concepts (battery trucks; hydrogen-powered trucks; overhead contact line trucks/eHighway), which can contribute to the development of a sustainable transport sector in Germany and ensure $CO_2$-free transport in the future [2]; M. Burns & J. Wulu – SWOT analysis of terrorist travel patterns and the US transport sector to identify vulnerabilities [3]; M. Chłąd – examination of internal and external factors affecting WIM systems (weighing in motion – based on the technology of measuring the weight of vehicles without having to stop), such as the performance of the technology, the cost of use, and the risk of consequences with protection against threats [5]; E. Mihocic et al. – the influence of social, environmental and economic factors on the government when planning sustainable rail infrastructure projects in Australia [10].

The object of our research is the sphere of international road freight transportations in Ukraine.

**Purpose, objectives and research methods.** The purpose of the article is to identify the strengths and weaknesses of the internal environment of the international freight road transportations sector of Ukraine, as well as the opportunities and threats of its external environment.

Research objectives:

1) to construction of a SWOT analysis matrix of the international freight road transportations sector of Ukraine;

2) to detailed analysis of the identified indicators;

3) to determination of a recommended development strategy for this sector.

To achieve this goal, one of the most popular methods of strategic management will be used – SWOT analysis (from the English **S**trengths, **W**eaknesses, **O**pportunities, **T**hreats), which makes

it possible to study the external and internal environment of the research object in an inextricable link.

**Research results.** To begin, let's build a SWOT analysis matrix for the international road freight transportations sector in Ukraine (Table 1).

*Table 1. SWOT analysis matrix of the international road freight transportations sector in Ukraine*

| INTERNAL ENVIRONMENT |
|---|
| Strengths (S) |
| S1. Convenient geographical location of the country: Ukraine is located between the European Union, Asia and the Black Sea, which makes it an important transit point.<br>S2. Extensive network of roads, especially highways connecting major cities and borders.<br>S3. Experienced carriers: availability of companies with experience in international transportations and qualified drivers.<br>S4. Competitive cost of services: relatively low costs for driver wages and transport operation.<br>S5. Access to European markets: simplification of customs control within the framework of the Association Agreement with the EU. |
| Weaknesses (W) |
| W1. Infrastructure condition: a significant part of the roads is in poor condition, which increases the cost of maintaining transport.<br>W2. Shortage of qualified drivers: partial emigration of drivers to EU countries due to higher wages.<br>W3. Bureaucracy: difficulties with paperwork and obtaining permits for international transportations.<br>W4. Technical condition of the vehicle fleet: a large share of outdated vehicles that do not meet EU environmental standards (e.g. Euro-6).<br>W5. Low level of digitalization: insufficient integration of modern IT solutions for logistics and tracking of transportations.<br>W6. Corruption. |
| EXTERNAL ENVIRONMENT |
| Opportunities (O) |
| O1. Expanding cooperation with the EU: developing TEN-T corridors and improving border infrastructure.<br>O2. Investing in modernization: attracting funding for road repairs and fleet renewal.<br>O3. Growing demand for transportations: increasing trade between Ukraine and the EU, Asia, and Turkey.<br>O4. Integration with new markets: entering the markets of Central Asia, the Caucasus, and the Middle East.<br>O5. Introducing innovations: using alternative fuels (electric vehicles, hydrogen) and transportations automation technologies. |
| Threats (T) |
| T1. Military operations: risk of infrastructure destruction and logistics complications due to war.<br>T2. Increased competition: increased competitive pressure from carriers from neighboring countries (Poland, Hungary, Turkey).<br>T3. EU environmental standards: the need for significant investments to bring the fleet into compliance with Euro-6 requirements.<br>T4. Economic instability: fluctuations in fuel prices, inflation, rising prices for services and spare parts.<br>T5. Border crossing restrictions: long queues, low throughput at checkpoints, particularly on the western border. |

*Source: author's development*

Let us consider in more detail the *strengths* of the international freight road transportations sector in Ukraine.

S1. The country's strategically advantageous geographical location. Ukraine can act as a key transit corridor for international freight transport, as it is located at the intersection of the main transport routes between the EU, Asia and the Black Sea.

Ukraine's transit potential is quite large, as four multimodal European transport corridors with a total length of 3,335 kilometers pass through its territory: North Sea – Baltic, Baltic Sea – Black Sea – Aegean, Mediterranean, Rhine – Danube [4, p. 1]. This ensures effective communication between the EU and Asia. According to estimates by the British Rendall Institute, Ukraine has the highest transit rating in Europe (3.75 in 2018), which indicates its significant potential in the field of transit transport [8, p. 132].

It should also be noted that Ukraine shares land borders with four EU countries (Poland, Romania, Slovakia, Hungary), which contributes to the development of cross-border cooperation and integration into the European transport network. Thus, Ukraine's advantageous geographical location creates significant opportunities for the development of transit potential and integration into international transport networks.

S2. Ukraine has an extensive network of highways, which provides connections between major cities and state borders. The national network of public highways is 166.3 thousand km, of which 47.7 thousand km are highways of state importance and 118.6 thousand km are highways of local importance [4, p. 1].

S3. Ukraine has significant potential in the field of international road transportations due to the presence of experienced carriers and qualified drivers. Many Ukrainian transport companies successfully carry out international transportations, ensuring high quality of services and compliance with international standards.

Ukraine has a system of training drivers for international transportations, which includes training, certification and regular medical examinations. According to Ukrainian legislation, drivers engaged in international transportations must undergo pre-trip and post-trip medical examinations, which ensure road safety.

S4. The cost of drivers' wages in Ukraine is lower than in many European countries. This is due to the economic conditions and the level of average wages in the country.

Transport operating costs in Ukraine include fuel costs, maintenance, depreciation and other related costs. The costs of maintaining, servicing and operating road transport make up a significant part of the total costs of enterprises, but remain competitive in the international market. A significant part of the competitive advantages in the transport industry, as in other sectors of the economy, has been acquired by Ukraine due to cheap labor [6, pp. 32–33].

S5. The Association Agreement between Ukraine and the EU, signed in 2014, was an important step towards Ukraine's integration into the European Economic Area. One of the key aspects of this agreement is the simplification of customs procedures, which significantly facilitates the access of Ukrainian goods to EU markets [1].

Ukraine is expected to introduce the institution of Authorized Economic Operators and join the EU's common transit system (New Computerised Transit System – NCTS). These measures are aimed at reducing the number of customs procedures, reducing the time for customs control and reducing costs for enterprises when carrying out international trade operations.

The institution of Authorized Economic Operators allows reliable companies to obtain simplified access to customs procedures. This increases the competitiveness of Ukrainian enterprises in external markets, ensuring transparency and predictability of procedures, as well as saving resources.

Ukraine's participation in the EU's common transit system (NCTS) creates advantages, including faster and cheaper movement of goods for exporters, carriers and importers. It also eliminates the need to declare export goods at the EU border, which simplifies the trade process.

Next, we will consider the *weaknesses* of the international road freight transportations sector in Ukraine.

W1. The condition of roads in Ukraine is a critical factor affecting the efficiency of transportations and the overall economic development of the country. A significant part of the roads is in unsatisfactory condition, which leads to increased costs for transport maintenance and negatively affects road safety. The road network of Ukraine is characterized by a high degree of wear and tear and insufficient funding for their maintenance and repair. This leads to deterioration in the transport and operational performance of roads and an increase in the accident rate.

W2. The shortage of qualified drivers in the field of international transportations is a pressing problem that affects the efficiency of logistics processes and the development of the transport industry. One of the key reasons for this shortage is the partial emigration of drivers to EU countries. The following factors of driver migration to the EU can be distinguished:

1) economic: the gap in salaries between EU and Eastern European countries can reach from 30 to 70%. For drivers, this means the opportunity to earn more for the same amount of work. For example, the average income of a driver in Poland costs about €1,500 per month, while in Germany it is up to €2,500–3,000;

2) social: better social guarantees, in particular health insurance, pension payments and legislative protection of workers' rights are additional incentives for labor migration;

3) working conditions: employers in Western European countries provide drivers with new fleets, regular safety training and additional bonuses for additional work hours, which ensures the quality of work.

Such migration leads to a decrease in the domestic labor market: a shortage of drivers can contribute to the development of local transport infrastructure, as a number of transport companies are forced to increase tariffs or reduce the volume of transportations. Also, the outflow of the working-age population leads to a decrease in the tax base, which affects the financing of social programs and budget stability.

W3. Bureaucratic obstacles are one of the key factors that complicate the work of transport companies and drivers in the field of international transportations. Despite the efforts of regulatory authorities to simplify procedures, many aspects remain too complex, which affects the efficiency and effectiveness of transportations.

The following main bureaucratic difficulties can be highlighted:

1) obtaining transport permits: obtaining permits for international transportations is often accompanied by significant expenditure of time and resources. In non-EU countries, this issue is further complicated by the need for additional documents, such as transit permits or certificates of conformity;

2) compliance with customs procedures: customs procedures are often unpredictable. This is due to different approaches to the clearance of goods, the need for multiple checks of documents and possible delays at customs points;

3) lack of uniform standards: countries have their own standards for the technical condition of vehicles, taxation and insurance systems. This forces companies to adapt to different requirements, which creates an additional burden on administrative staff.

W4. The problem of the technical condition of the vehicle fleet is one of the most important for international transportations. A large share of outdated vehicles that do not meet modern environmental standards, such as Euro-6, significantly limits the ability of companies to operate in European markets. This creates not only economic, but also environmental problems that require a comprehensive solution.

We highlight the following reasons for the obsolescence of the vehicle fleet:

1) insufficient financing for fleet renewal: transport companies in many developing countries face financial constraints that do not allow them to regularly update their fleet. The high cost of modern environmentally friendly vehicles is a key obstacle;

2) lack of incentives for modernization: there are no effective state subsidy or preferential lending programs in Ukraine that would stimulate transport companies to switch to vehicles that meet the Euro-6 standard;

3) use of "gray" imports of equipment: a significant part of companies imports obsolete vehicles from the secondary market, in particular from Western European countries, where they no longer meet environmental standards.

W5. Low level of digitalization: insufficient integration of modern IT solutions for logistics and transportation tracking. In the modern world, digital technologies play a key role in increasing the efficiency of logistics and transport services. However, in Ukraine, the level of digitalization of the transport industry remains insufficient, which limits competitiveness in the international transportation market. Low integration of IT solutions leads to reduced productivity, complicated transportation management and increased costs.

We highlight the following reasons for the low level of digitalization:

1) insufficient funding: a significant part of Ukrainian transport companies do not have sufficient financial resources to implement modern IT solutions. This includes costs for software, equipment and personnel training;

2) lack of incentives for modernization: the state does not sufficiently stimulate the development of digital technologies in the logistics sector. In particular, there is a lack of tax breaks or state grants for the implementation of innovative solutions;

3) lack of qualified personnel: many companies face the problem of finding specialists who have modern technologies for managing logistics and transport processes;

4) resistance to change: many companies, especially small and medium-sized businesses, have a traditional approach to work. This is due to the reluctance to take risks and invest in new technologies, fearing significant costs and uncertain results.

All this leads to a decrease in the efficiency of transportation management, increased costs, loss of competitiveness, as well as insufficient transparency of logistics processes.

W6. Corruption is one of the biggest barriers to the development of international road transportations in Ukraine. It creates unequal conditions for market participants, increases companies' costs, reduces the investment attractiveness of the industry and hinders Ukraine's integration into the European logistics system.

The main manifestations of corruption are:

1) opacity in issuing permits for international transportations. The process of obtaining permits for international transportations in Ukraine is often accompanied by opaque distribution mechanisms. Companies are often forced to pay bribes to gain access to permits or to speed up their issuance;

2) corruption at customs: customs authorities in Ukraine often become a source of corruption pressure on transport companies. Drivers are forced to pay unofficial "fees" to avoid delays or simplify the paperwork;

3) opacity in conducting inspections: during vehicle inspections at checkpoints, situations often arise when inspectors demand bribes for a "positive" inspection result;

4) use of administrative resources: some companies receive preferences due to connections with officials, which creates unequal conditions for business and hinders fair competition.

All this leads to an increase in the costs of transport companies, a decrease in the competitiveness of Ukrainian carriers, a deterioration in the investment climate, and a loss of trust in state institutions.

Next, we will consider the *possibilities* of the international road freight transportations sector in Ukraine.

O1. Ukraine's integration into the European transport area is an important aspect of the development of international transport. Within the framework of cooperation with the EU, special attention is paid to the development of TEN-T (Trans-European Transport Network) transport

corridors and the improvement of border infrastructure. These measures contribute not only to improving the country's logistical capabilities, but also to increasing its economic and geopolitical significance. TEN-T corridors are key routes that provide a connection between the main transport hubs of the EU and neighboring countries. Ukraine is part of the extended TEN-T network, which provides for the development of infrastructure to facilitate fast, safe and environmentally friendly transportations. Modernization of roads and railways within the framework of TEN-T allows to significantly reduce the time of cargo transportations and reduce transport costs. This is especially important for the integration of Ukraine into global supply chains. The development of transport corridors makes Ukrainian companies more competitive in the European market, as access to the main EU markets is ensured through fast and efficient routes. Expanding Ukraine's participation in TEN-T creates attractive conditions for foreign investors who are ready to invest in infrastructure modernization. Investments contribute to economic growth and the creation of new jobs. Ukraine's participation in TEN-T will also lead to improved border infrastructure, which will reduce border crossing times and improve conditions for drivers and transport companies.

O2. Investments in the modernization of transport infrastructure and renewal of vehicle fleets are key factors for ensuring sustainable economic development of Ukraine. A developed transport system contributes to increasing the competitiveness of the national economy and improving the quality of life of the population.

Ukraine has a favorable geographical location at the intersection of the main transit routes between Europe and Asia, which creates the prerequisites for increasing the volume of cargo transit. However, the current state of the transport industry does not meet the growing needs of society and European quality standards for the provision of transport services. The existing structure of management of the transport and road complex, the state of the production and technical base and the technological level of transportation organization require reform and modernization [12, p. 3].

Modernization of transport infrastructure includes repair and construction of new highways, modernization of bridges and transport nodes, as well as integration with international transport corridors. These measures will contribute to increasing the speed of transportation, reducing vehicle wear and tear and improving the safety of logistics operations.

Fleet modernization involves the implementation of innovative technologies, such as transport management systems (TMS), integration of multimodal solutions, use of digital SCM systems and environmentally friendly logistics solutions. This will increase the efficiency of resource management, reduce the time for logistics operations and ensure transparency of processes.

O3. The growth of trade between Ukraine and the EU, Asia and Turkey will contribute to an increase in demand for transportations, which requires the development of appropriate infrastructure and logistics solutions.

It should be noted that in the first half of 2023, a decrease in the value of exports to the EU by 10% was recorded, which is associated with problems with the transit of agricultural products and the ban on the import of grain and oilseed crops by individual EU member states [14].

Asian countries occupy the third place in terms of specific weight in Ukraine's foreign trade turnover after the SES and EU countries. In trade with the SES and EU countries, Ukraine has a negative balance, while in trade with Asian countries it is positive.

In 2021, bilateral trade in goods between Ukraine and Turkey reached over 7.4 billion USD, which accounted for 5.3% of Ukraine's foreign trade turnover. Trade turnover between the countries increased by 52.5% compared to 2020, showing an upward trend after a decline in 2014–2016 and 2020 [13, p. 10].

The growth of trade turnover with these regions increases the demand for transportations, especially multimodal, which combines different modes of transport.

O4. Integration of Ukrainian road transport with the markets of Central Asia, the Caucasus and the Middle East is a strategically important direction for the development of the national

transport system. Expanding cooperation with these regions will contribute to the diversification of trade routes, increasing economic stability and strengthening the geopolitical positions of Ukraine.

The markets of Central Asia, the Caucasus and the Middle East are characterized by rapid economic growth and growing demand for quality transport services. Integration with these regions opens up opportunities for Ukraine to increase exports and imports, as well as transit traffic.

For effective integration, it is necessary to develop international transport corridors that connect Ukraine with the indicated regions. In particular, the Odesa-Samsun ferry project, which is planned to be included in the ferry system between Ukraine, Bulgaria, and Georgia in the future, will create a new transport corridor between the EU and Turkey, minimizing the time for transporting goods from the Baltic countries, Central Europe, and their transit to Iran, Iraq, and other countries in the Near and Middle East [11].

O5. The introduction of innovations in the transport sector of Ukraine, in particular the use of alternative fuels and transportations automation technologies, is an important step towards increasing the efficiency and environmental friendliness of the country's transport system.

Electric vehicles are becoming increasingly popular in Ukraine, contributing to the reduction of greenhouse gas emissions and dependence on fossil fuels. According to the Ministry of Infrastructure of Ukraine, as of 2023, more than 30 thousand electric vehicles were registered in the country, and this figure continues to grow.

Hydrogen is also considered a promising alternative fuel. Hydrogen cars have a longer range per tank compared to electric cars, and refueling with hydrogen takes less time than charging an electric car. However, today hydrogen cars are less common due to the high cost of production and insufficient infrastructure for refueling.

It should be emphasized that the introduction of hydrogen technologies in the transport sector of Ukraine can contribute to the reduction of $CO_2$ emissions and increase the country's energy independence. In particular, in [9] it is stated that hydrogen can be considered a universal fuel for vehicles, since it has absolute environmental friendliness and can replace gasoline, diesel fuel and fuel oil in all types of thermal engines.

The use of transport management systems (TMS) allows you to automate the processes of planning, execution and control of transportations, which increases the efficiency of logistics operations. In particular, the TMS solution automates the calculation processes necessary for the transportation of goods: optimal cargo losses, inventory accounting, fuel consumption rates, the optimal number of stops, etc.

Next, we will consider the *threats* to the international road freight transportations sector in Ukraine.

T1. Military operations in Ukraine have caused significant destruction of infrastructure and complication of logistics processes, which has significantly affected the country's economy. The full-scale invasion led to the destruction and damage of transport highways, bridges, railways and logistics warehouses. The logistics industry in Ukraine has undergone rapid negative changes due to disruption of logistics chains and destruction of infrastructure.

Destroyed infrastructure, blocked ports and constant security threats have become new realities for business. The war has significantly changed the functioning of logistics processes in the country, creating numerous challenges for carriers and forwarders.

T2. Increased competition from carriers from neighboring countries, such as Poland, Hungary and Turkey, is putting significant pressure on Ukrainian transport operators. This phenomenon is due to a number of factors, including geographical location, economic conditions and integration processes in the region.

Polish and Hungarian carriers, as members of the EU, have access to the single market and benefit from simplified customs procedures, which allows them to offer more competitive rates and faster delivery times. This creates additional challenges for Ukrainian companies, which are forced to adapt to tougher competition.

Turkish carriers are also actively expanding their presence in international markets, using Turkey's strategic location as a transit hub between Europe and Asia. Their competitiveness is strengthened by investments in modern fleets and logistics infrastructure.

Ukrainian carriers are faced with the need to increase the efficiency of their operations and implement modern technologies to maintain their competitive position. In particular, it is important to update the fleet, optimize routes and implement transport management systems.

At the same time, Ukrainian companies should take into account restrictions on cabotage in EU countries. Ukrainian carriers should take into account that cabotage applies exclusively to carriers from EU countries, for Ukrainian companies cabotage is a gross violation.

T3. The introduction of Euro-6 environmental standards in Ukraine is an important step towards reducing harmful emissions from road transport and integrating with European environmental standards. However, achieving compliance with these standards requires significant investments in updating the fleet and infrastructure.

The transition to the Euro-6 standard requires Ukrainian carriers to update their vehicles, since the majority of used cars do not meet these requirements. This involves significant financial costs for the purchase of new vehicles or the modernization of existing ones.

T4. Rising fuel and spare parts prices lead to higher costs of road transport services. This forces carriers to raise rates, which may reduce demand for their services. In addition, the instability of demand complicates the planning and allocation of resources, which negatively affects the economic efficiency of enterprises.

T5. Border crossing restrictions, including long queues and low capacity at checkpoints on Ukraine's western border, have a significant impact on international road transportations.

Since the start of the full-scale war, the flow of goods across Ukraine's western borders has increased significantly due to blocked ports and closed borders with Russia and Belarus. However, the number of checkpoints on the western border is insufficient to handle this volume of traffic. This leads to long queues, with drivers forced to wait for days or even weeks to cross the border.

Long delays at the border have led to increased logistics costs, which, according to some estimates, have increased by one and a half times.

**Discussion.** Within the framework of this study, we have identified five strengths, six weaknesses, five opportunities and five threats for the international road freight transportations sector in Ukraine. Of course, this list can be supplemented with other indicators, detailing the indicators defined in Table 1, or adding new ones, depending on the conditions in which this sector is at the current stage of development of the Ukrainian economy, as well as new challenges and opportunities that will appear in the future. In addition, the indicators can be grouped into separate sections and considered in parallel within each section:

*internal environment:*

1) marketing;
2) material resources;
3) labor resources;
4) financial resources;
5) management;

*external environment:*

1) social environment.
2) economic environment;
3) legal environment;
4) scientific and technological progress;
5) natural environment;
6) competitive environment [18, p. 144].

We believe that for the further development of the international freight road transportations sector in Ukraine, it is advisable to apply the "Mini-Maxi" strategy, which is aimed at minimizing

internal weaknesses based on the use of external opportunities, in particular, increasing the competitiveness of services provided by domestic carriers by eliminating bureaucratic obstacles and effectively combating corruption, providing preferential lending or attracting investments for transport companies to update their fleet and digitalize their activities, increasing the throughput capacity of customs posts, etc. And, of course, restoring infrastructure damaged and destroyed as a result of military actions, to the extent that this is financially possible and appropriate in wartime conditions.

**Conclusions**. The sphere of international freight road transportations plays an important role in the foreign economic activity of Ukraine. It has a number of important advantages: the convenient geographical location of the country between the EU, Asia and the Black Sea; an extensive network of highways; experienced carriers; competitive cost of services; access to European markets. At the same time, we have identified a number of weaknesses: the unsatisfactory condition of a significant part of the infrastructure; a shortage of qualified drivers; difficulties with the execution of documents and obtaining permits for international transportations; the technical condition of the fleet; a low level of digitalization; corruption.

If we take into account the external environment of the international road freight transportations sector in Ukraine, the following opportunities can be identified: expanding cooperation with the EU; investments in modernization; growing demand for transportations; integration with new markets in Central Asia, the Caucasus, and the Middle East; introduction of innovations, in particular the use of alternative fuels and transportations automation technologies. However, today there are also certain threats to domestic international road freight carriers: military operations on the territory of the state; increased competition from carriers from neighboring countries (Poland, Hungary, Turkey); lack of sufficient funding to comply with EU environmental standards; economic instability; restrictions on border crossing.

One of the important steps in the development of the transport sector of Ukraine, and in particular international road freight transportations, is certainly the adoption of the National Transport Strategy of Ukraine for the period until 2030 and the approval of the operational plan of measures for its implementation in 2025–2027. The implementation of these documents involves not only the declaration of a number of goals, but also the implementation of annual monitoring of implementation.

We see further research into the field of international road freight transportations of Ukraine in the application of other methods and the construction of models that will serve as the basis for making decisions regarding its entry to a new level of service quality and competitiveness.

**References**

1. Association Agreement between Ukraine, of the one part, and the European Union, the European Atomic Energy Community and their Member States, of the other part. (2014). Retrieved from: https://zakon.rada.gov.ua/laws/show/984_011#Text [in Ukrainian]
2. Bremer, L., & Kassens-Noor, E. (2025). Framework for the implementation of an innovation corridor for road freight transport in Germany. *Transportation Research Procedia*. 82. 3900–3911. https://doi.org/10.1016/j.trpro.2024.12.006
3. Burns, M., & Wulu, J. (2025). Strategies to combat terrorism: proactive intelligence measures for assessing risks and preventing terrorism prior to transportation embarkation points. *Journal of Transportation Security*. 18(1). https://doi.org/10.1007/s12198-025-00293-z
4. Cabinet of Ministers of Ukraine. (2024). On approval of the National Transport Strategy of Ukraine for the period until 2030 and approval of the operational plan of measures for its implementation in 2025–2027: Resolution of the Cabinet of Ministers of Ukraine dated December 27, 2024 No. 1550. Retrieved from https://zakon.rada.gov.ua/laws/show/1550-2024-%D0%BF#Text [in Ukrainian]
5. Chłąd, M. (2024). SWOT analysis for investment management in the scope of implementing an automatic vehicle weighing system in motion. *Polish Journal of Management Studies*. 30(1). 42-65. https://doi.org/10.17512/pjms.2024.30.1.03
6. Dorofieieva, K. M. (2016). Competitiveness of Ukraine's transport infrastructure in terms of EU integration. *Economy and Society*. 7. 30–35. Retrieved from: https://economyandsociety.in.ua/journals/7_ukr/6.pdf [in Ukrainian]
7. Karas, O. O., & Buhaievskyi, R. S. (2013). Application of SWOT analysis in the study of the transport services market. *Collection of scientific works of the State Economic and Technological University of Transport. Series: Economics and Management*. 23–24. 30–37. Retrieved from: http://nbuv.gov.ua/UJRN/Znpdetut_eiu_2013_23-24_7 [in Ukrainian]
8. Lutsenko, I. S. (2020). Transit potential of Ukraine: state and ways of improvement. *Business, innovation, management: problems and prospects*, collection of abstracts of the 1st International Scientific and Practical Conference. Kyiv: Igor

Sikorsky Kyiv Polytechnic Institute, publishing house «Polytechnica». Retrieved from: https://confmanagement-proc.kpi.ua/article/view/201182 [in Ukrainian]

9. Melnyk, Z. (2022). «Green» reconstruction of Ukraine: prospects for the use of hydrogen in transport. Retrieved from: https://delo.ua/uk/energetics/zelena-vidbudova-ukrayini-perspektivi-zastosuvannya-vodnyu-v-transporti-400409/#google_vignette [in Ukrainian]
10. Mihocic, E., Gharehbaghi, K., Hilletofth, P., Tee, K. F., & Myers, M. (2025). Augmenting the cities' and metropolitan regional demands for mega rail infrastructure: the application of SWOT and factor analysis. *Smart and Sustainable Built Environment*. 14(2). 377–406. https://doi.org/10.1108/SASBE-02-2023-0044
11. National Institute for Strategic Studies. (2011). *Mkhytarian, N. The state and prospects of Ukrainian-Turkish relations: analytical note*. Retrieved from: https://niss.gov.ua/doslidzhennya/mizhnarodni-vidnosini/stan-ta-perspektivi-ukrainsko-tureckikh-vidnosin-analitichna?utm [in Ukrainian]
12. National Institute for Strategic Studies. (2013). Sobkevych, O. V., Mykhailychenko, K. M., & Yemelianova, O. Yu. Modernization priorities for reforming the transport and road complex in Ukraine: analytical supplement. Retrieved from: https://niss.gov.ua/sites/default/files/2013-05/refor_tdk.pdf [in Ukrainian]
13. National Institute for Strategic Studies. (2022). Havrylenko, N., Bobrovytskyi, A., Zamikula, M., Parakhonskyi, B., Us, I., Shyrokyi, H., & Yavorska, H. Strategic partnership with the Republic of Turkey: foreign economic aspects: analytical supplement. Retrieved from: https://niss.gov.ua/sites/default/files/2022-11/analit.dop.-turechchina_18.11.2022.pdf [in Ukrainian]
14. National Institute for Strategic Studies. (2023). *Foreign trade in goods. Results of the first half of 2023*. Retrieved from: https://niss.gov.ua/doslidzhennya/mizhnarodni-vidnosyny/zovnishnya-torhivlya-tovaramy-pidsumky-i-pivrichchya-2023-roku?utm [in Ukrainian]
15. Novikova, A., Lytvynenko, S., Yashchenko, T., Voitsehovskiy, V., Dehtiar, Z., & Ovchar, P. (2024). SWOT analysis of Ukraine's transport industry. *MATEC Web of Conferences*. https://doi.org/10.1051/matecconf/202439003001
16. Sementsova, O. V., & Krykhtina, Yu. O. (2018). SWOT-analysis application in the control system of the composition of the pipes in the market of passenger transport services. *Scientific Bulletin of the International Humanitarian University. Ser.: Economics and Management*. 31. 53–57. Retrieved from: http://nbuv.gov.ua/UJRN/Nvmgu_eim_2018_31_13 [in Ukrainian]
17. Shkulipa, L. V. (2013). Application of SWOT analysis to assess the feasibility of restructuring in Ukrainian railway transport. *Socio-Economic Research Bulletin*. 1. 168–175. Retrieved from: http://nbuv.gov.ua/UJRN/Vsed_2013_1_28 [in Ukrainian]
18. Totska, O. L. (2020). *Managing the development of higher education of Ukraine in European educational area*: monograph. Vezha-Druk. Retrieved from: https://evnuir.vnu.edu.ua/handle/123456789/20037 [in Ukrainian]
19. Vedmid, I. S. (2015). Research of strengths, weaknesses and opportunities and threats of rail freight with SWOT analysis matrix. *The Bulletin of Transport and Industry Economics*. 49. 54–58. Retrieved from: http://nbuv.gov.ua/UJRN/Vetp_2015_49_10 [in Ukrainian]

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**SWOT-аналіз сфери міжнародних вантажних автомобільних перевезень України**

**Анотація.** У забезпеченні вільного руху товарів між Україною та її зовнішніми партнерами, зокрема ЄС, важливу роль відіграє сфера міжнародних вантажних автомобільних перевезень України.

**Постановка проблеми.** Для дослідження її зовнішнього та внутрішнього середовища можна застосувати SWOT-аналіз.

**Нерозв'язані аспекти.** Побудовано матрицю SWOT-аналізу сфери міжнародних вантажних автомобільних перевезень України.

**Мета статті.** Метою статті є ідентифікація сильних і слабких сторін, а також можливостей і загроз сфери міжнародних вантажних автомобільних перевезень України.

**Основний матеріал.** Визначено низку важливих переваг: зручне географічне розташування держави; розгалужена мережа автомобільних доріг; досвідчені перевізники; конкурентна вартість послуг; доступ до європейських ринків. Виділено низку слабких сторін: незадовільний стан значної частини інфраструктури; дефіцит кваліфікованих водіїв; складнощі з оформленням документів та отриманням дозволів на міжнародні перевезення; технічний стан автопарку; низький рівень цифровізації; корупція.

Ідентифіковано такі можливості: розширення співпраці з ЄС; інвестиції в модернізацію; зростання попиту на перевезення; інтеграція з новими ринками Центральної Азії, Кавказу, Близького Сходу; впровадження інновацій. Виділено певні загрози: воєнні дії на території держави; посилення конкуренції зі сторони перевізників із сусідніх країн; відсутність достатнього фінансування на дотримання екологічних стандартів ЄС; економічна нестабільність; обмеження на перетин кордону.

**Висновки.** Для подальшого розвитку сфери міжнародних вантажних автомобільних перевезень України доцільно застосувати стратегію «Міні-Максі», яка спрямована на мінімізацію внутрішніх слабких сторін на основі використання зовнішніх можливостей.

***Ключові слова:*** *міжнародні вантажні автомобільні перевезення, Україна, ЄС, SWOT-аналіз, сильні сторони, слабкі сторони, можливості, загрози, стратегія.*

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**Список літератури**

1. Угода про асоціацію між Україною, з однієї сторони, та Європейським Союзом, Європейським співтовариством з атомної енергії і їхніми державами-членами, з іншої сторони. 2014. URL: https://zakon.rada.gov.ua/laws/show/984_011#Text
2. Bremer L., Kassens-Noor E. Framework for the implementation of an innovation corridor for road freight transport in Germany. *Transportation Research Procedia*. 2025. Vol. 82. Pp. 3900–3911. DOI: https://doi.org/10.1016/j.trpro.2024.12.006
3. Burns M., Wulu J. Strategies to combat terrorism: proactive intelligence measures for assessing risks and preventing terrorism prior to transportation embarkation points. *Journal of Transportation Security*. 2025. Vol. 18, issue 1. DOI: https://doi.org/10.1007/s12198-025-00293-z
4. Про схвалення Національної транспортної стратегії України на період до 2030 року та затвердження операційного плану заходів з її реалізації у 2025–2027 роках: Постанова КМУ від 27 груд. 2024 р. № 1550. URL: https://zakon.rada.gov.ua/laws/show/1550-2024-%D0%BF#Text
5. Chłąd M. SWOT analysis for investment management in the scope of implementing an automatic vehicle weighing system in motion. *Polish Journal of Management Studies*. 2024. Vol. 30, no. 1. Pp. 42-65. DOI: https://doi.org/10.17512/pjms.2024.30.1.03

6. Дорофєєва Х. М. Конкурентоспроможність транспортної інфраструктури України в умовах інтеграції до ЄС. *Економіка та суспільство*. 2016. Вип. 7. С. 30–35. URL: https://economyandsociety.in.ua/journals/7_ukr/6.pdf
7. Карась О. О., Бугаєвський Р. С. Застосування SWOT-аналізу при дослідженні ринку транспортних послуг. *Збірник наукових праць Державного економіко-технологічного університету транспорту. Сер.: Економіка і управління*. 2013. Вип. 23–24. С. 30–37. URL: http://nbuv.gov.ua/UJRN/Znpdetut_eiu_2013_23-24_7
8. Луценко І. С. Транзитний потенціал України: стан та шляхи покращення. *Бізнес, інновації, менеджмент: проблеми та перспективи*: зб. тез доп. І Міжнар. наук.-практ. конф., 23 квіт. 2020 р. Київ: КПІ ім. Ігоря Сікорського, вид-во «Політехніка», 2020. С. 132–133. URL: https://confmanagement-proc.kpi.ua/article/view/201182
9. Мельник З. «Зелена» відбудова України: перспективи застосування водню в транспорті. *Інтернет видання Delo.ua*: вебсайт. 2022. URL: https://delo.ua/uk/energetics/zelena-vidbudova-ukrayini-perspektivi-zastosuvannya-vodnyu-v-transporti-400409/#google_vignette
10. Mihocic E., Gharehbaghi K., Hilletofth P., Tee K. F., Myers M. Augmenting the cities' and metropolitan regional demands for mega rail infrastructure: the application of SWOT and factor analysis. *Smart and Sustainable Built Environment*. 2025. Vol. 14, no. 2. Pp. 377–406. DOI: https://doi.org/10.1108/SASBE-02-2023-0044
11. Мхитарян Н. Стан та перспективи українсько-турецьких відносин: аналіт. зап. Київ: Національний інститут стратегічних досліджень, 2011. URL: https://niss.gov.ua/doslidzhennya/mizhnarodni-vidnosini/stan-ta-perspektivi-ukrainsko-tureckikh-vidnosin-analitichna?utm
12. Собкевич О. В., Михайличенко К. М., Ємельянова О. Ю. Модернізаційні пріоритети реформування транспортно-дорожнього комплексу в Україні: аналіт. доп. Київ: Національний інститут стратегічних досліджень, 2013. 32 с. URL: https://niss.gov.ua/sites/default/files/2013-05/refor_tdk.pdf
13. Гавриленко Н., Бобровицький А., Замікула М., Парахонський Б., Ус І., Широкий Г., Яворська Г. Стратегічне партнерство з Турецькою Республікою: зовнішньоекономічні аспекти: аналіт. доп. Київ: Національний інститут стратегічних досліджень, 2022. 59 с. URL: https://niss.gov.ua/sites/default/files/2022-11/analit.dop.-turechchina_18.11.2022.pdf
14. Зовнішня торгівля товарами. Підсумки І півріччя 2023 року. Київ: Національний інститут стратегічних досліджень, 2023. URL: https://niss.gov.ua/doslidzhennya/mizhnarodni-vidnosyny/zovnishnya-torhivlya-tovaramy-pidsumky-i-pivrichchya-2023-roku?utm
15. Novikova A., Lytvynenko S., Yashchenko T., Voitsehovskiy V., Dehtiar Z., Ovchar P. SWOT analysis of Ukraine's transport industry. *MATEC Web of Conferences*, 2024. DOI: https://doi.org/10.1051/matecconf/202439003001
16. Семенцова О. В., Крихтіна Ю. О. Застосування SWOT-аналізу в системі управління конкурентоспроможністю залізниць на ринку послуг з перевезень пасажирів. *Науковий вісник Міжнародного гуманітарного університету. Сер.: Економіка і менеджмент*. 2018. Вип. 31. С. 53–57. URL: http://nbuv.gov.ua/UJRN/Nvmgu_eim_2018_31_13
17. Шкуліпа Л. В. Застосування SWOT-аналізу для оцінки доцільності проведення реструктуризації на залізничному транспорті України. *Вісник соціально-економічних досліджень*. 2013. Вип. 1. С. 168–175. URL: http://nbuv.gov.ua/UJRN/Vsed_2013_1_28
18. Тоцька О. Л. Управління розвитком вищої освіти України в Європейському освітньому просторі: монографія. Луцьк: Вежа-Друк, 2020. 532 с. URL: https://evnuir.vnu.edu.ua/handle/123456789/20037
19. Ведмідь І. С. Дослідження сильних та слабких сторін, загроз та можливостей вантажних перевезень залізничного транспорту при застосуванні матриці SWOT-аналізу. *Вісник економіки транспорту і промисловості*. 2015. Вип. 49. С. 54–58. URL: http://nbuv.gov.ua/UJRN/Vetp_2015_49_10

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# Сучасні макроекономічні тренди та тенденції

# Modern macroeconomic trends and tendencies

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## The nexus between monetary base and government debt - empirical evidence from Algeria

***Abstract.*** The complex interplay between monetary and fiscal policies is crucial for macroeconomic stability, especially in emerging economies like Algeria. Algeria's heavy reliance on oil revenue adds a unique layer of complexity, as global oil price fluctuations significantly impact government finances. This study investigates the relationship between the monetary base and government debt, a crucial aspect of understanding how fiscal and monetary policies interact in this context.

**Problem statement.** This study aims to analyze the relationship between the monetary base (M1) and government debt in Algeria, examining how this nexus influences the effectiveness of both fiscal and monetary policies.

**Unresolved aspects of the problem.** The unresolved issues in our work is the real dynamics between fiscal and monetary policies in the side of government debt management.

**Purpose of the article.** By understanding this relationship, the study aims to provide valuable insights for policymakers regarding potential consequences of their decisions and the importance of coordination for achieving long-term macroeconomic stability.

**Presentation of the main material.** The study employs a time-series econometric approach using the Autoregressive Distributed Lag (ARDL) model. This approach allows for the analysis of the long-term cointegration between the monetary base and government debt, using data from 1990 to 2024. The analysis also incorporates a simulation using MATLAB to visualize the relationship between the two variables over a 20-year horizon.

**Conclusions.** The results of the ARDL analysis indicate a statistically significant negative relationship between lagged government debt and M1, suggesting that higher government debt levels in the previous period lead to a decrease in the monetary base in the current period. This finding suggests that Algeria's non-Ricardian fiscal policy, which relies on increasing public debt ratios to satisfy budgetary constraints, has a notable impact on the monetary base. The simulation results further illustrate the short-term effects of government debt on Algeria's monetary base, emphasizing the need for careful coordination between fiscal and monetary policies to ensure long-term macroeconomic stability.

***Keywords:*** *Algeria, Monetary base, Fiscal policy, Simulation, Government debt.*
Formulas: -; fig.: 1; tabl.: 1; bibl.: 30.

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**Introduction.** In emerging economies like Algeria, macroeconomic stability depends on the complex interaction between monetary and fiscal policy. This study examines the relationship between the monetary base and government debt and how it affects Algeria's dynamic monetary and fiscal policy. This complex link provides crucial insights into policy efficacy, economic development, and public budgets.Due to recent economic upheavals, research on monetary and fiscal policy interconnections has increased worldwide(Afonso et al., 2019; Ahmed, 2020; Albonico & Rossi, 2017; Azad et al., 2021; Cevik et al., 2014; Chadha & Nolan, 2019; Dimakou, 2015; Foresti, 2018; Pacifico, 2021). From the 1970s Great Inflation to the Great Financial Crisis and worldwide pandemic, experts have struggled with policy coordination, conflict, and economic stability. The literature provides significant insights, but developing economies, especially those with distinctive structural traits and historical settings, have yet to be thoroughly examined.

Algeria is a fascinating example. As a resource-rich nation with a history of economic instability, authorities must balance economic growth, inflation, and fiscal sustainability. Algeria's heavy reliance on oil income complicates the conventional divide between monetary policy, which seeks price stability, and fiscal policy, which manages state finances and promotes growth. Global oil price fluctuations can significantly affect government finances, making policy coordination difficult.This background is crucial to the monetary base-government debt link. Open market activities of central banks affect bank reserves and interest rates. Government debt, on the other hand, indicates the government's accumulated borrowing and may affect monetary policy. The necessity to fund government debt may limit the central bank's capacity to manage the money supply and control inflation if these variables are closely related. This increases economic volatility and hinders macroeconomic stability (Foresti, 2015; van Aarle et al., 1995).

The literature on monetary and fiscal policy linkages suggests four important Algerian considerations:

- Debt Sustainability and Fiscal Dominance: Fiscal dominance, when fiscal policy trumps monetary policy, might threaten macroeconomic stability (Sargent & Wallace, 1981).Algeria relies on hydrocarbon earnings. Hence, government expenditure is typically impacted by short-term oil price swings, resulting in unsustainable debt. This may impair the central bank's money supply management and cause inflation. Algeria's policymakers must understand fiscal dominance and debt sustainability.
- Mechanisms for transmitting monetary policy : The transmission mechanisms of monetary policy determine its efficacy in influencing economic activity. Algeria's financial sector structure, shallow financial markets, and informal financing channels might make monetary policy signals challenging to transmit. The relationship between interest rate fluctuations and investment decisions, especially in non-hydrocarbons, remains essential to study.
- Policy Cooperation and Credibility: Monetary and fiscal policies depend on officials' cooperation and commitment to common goals. Algerian monetary and budgetary authorities might lose credibility if policy intentions are not transparent and communicated. This can decrease investment decisions, increase economic volatility, and enhance economic actor uncertainty.
- Institutional and structural factors: Economy-wide structural characteristics and institutional frameworks affect monetary and fiscal policy efficacy. These include tax system efficiency, governance, financial sector regulation, and legal system strength. Effective policy interventions require understanding how these structural elements shape policy interactions.

By focusing on the Algerian economy, this study adds to the literature. We will use a time-series econometric approach to study the long-run connection between the monetary base and government debt, allowing for non-linearity.

This paper seeks to contribute by analysing the monetary base and government debt nexus and its effects on fiscal and monetary policy interactions in Algeria:

- Better grasp Algerian policy dynamics: The study's detailed empirical research of the monetary base and government debt sheds light on Algerian policy dynamics.
- Inform policymaking and promote economic stability: The study will help policymakers understand the possible effects of their policy choices, guiding their long-term macroeconomic stability initiatives.

The study's findings will add to the literature on monetary and fiscal policy interactions in emerging countries, highlighting their specific difficulties and potential. This paper uses a rigorous econometric methodology to examine Algeria's long-term monetary base-government debt connection. We examine how this nexus affects monetary and fiscal policy, not just its presence. We aim to improve policymakers' understanding of Algeria's policy landscape and help them adopt effective and sustainable economic policies by disentangling causal linkages and identifying policy drivers.

**Literature review.** Delving into the nature of the relationship between the monetary base and the government debt ratio is extremely important. As this topic determines the status of the economy, as it touches on several other variables. More than that, this relationship reflects the nature of the relationship between the financial and monetary authorities on the part of strategic interactions in the construction of Public economic policies.

(Dwyer, Nov., 1985) touched upon the wide debate regarding the extent of the impact of governments ' deficits and increasing fiscal policy, and its effects on various economic aspects, especially its implications on the work of monetary policy for an economy and the various variables on which interest rates and the monetary base are based . (Beard & McMillin, 1986) Studied the Features of the relationship between the Federal Reserve and various variables that affect its behavior, such as government deficits, bureaucratic obstacles and interest rates according to a standard approach.

(Woodfrod, August 1995) Touched upon the concept of the current values of surpluses for the future of the government budget and the extent to which they are influenced by the conduct of monetary policy in the aspect of the management of the monetary base in the economy. ( Garcia, 1998) Connected public debt and monetary base with other variables such us fiscal surplus, real interest rate, and income growth. ( Filardo, Mohanty, & Moreno, 2012) Pointed the impact of the size and maturity structure of the government debt market on monetary policy. Same work by (BARTKOWIA, BOITAN, & CAMPEANU, 2020).

When studying the link between monetary base and government debt, it is impossible to bypass the idea of financial inflation caused by expansionary fiscal policy, since (Ryan-Collins, october,2015) explored the theoretical aspect that restricts monetary policy by coinciding all high debt rates with a reduction in interest rates. The most important results came that the policy of stimulating demand through direct financing from the central bank causes uncontrolled inflation. In the same context, (Leão, july,2015) showed that in the case of financing the deficit at the launch stage of the expansionary fiscal policy through a new additional monetary base, inflationary consequences and pressures could be avoided. In addition, the private sector should be aware at this stage of the process of seeking new ways to provide capital. After that, ( Romero & Marín, January-June, 2017) concluded that increases in public debt ratios are inevitably inflationary increases. Lately, (Ma & Qamruzzaman, 2022) assessed the cointegration between government debt and uncertain economic policies Based on several standard methods (ARDL, NARDL, Fourier Toda-Yamamoto causality tests). The results showed the existence of negative long run nexus.(Leclaire, 2023) defending the MMT (Modern Monetary Theory) confirm the key role of money base as part of the central bank budget, and its link with public debt which could be a replacement of money base in the central bank budget.

Furthermore, (Thadden, june,2003) took the study of government debt behavior under two monetary policy rules. Mai finding showed that under ’’constant money growth rule’’ there is range for reassessments of public debt. On the other hand, when monetary policy adopts an explicit inflation-targeting rule, additional budget constraints are required. The previous study was in the

framework of active monetary policies offset by a passive fiscal policy, but what (Blommestein & Turner, 2012) did was to argue the phenomenon of the growth of government debt and its impact on the interactions of the management of government debt and the functionality of monetary policy. We remain within the framework of monetary financial interactions and the concept of debt monetization by the central bank after moving in the same approach, as when government bonds are traded between financial institutions during open market operations. Such operations affect the bank's reserves, which subsequently affects the monetary base, (Ahmed, 2019) by measuring the correlation between government debt and the monetary base; he found that there is stability in the long term and an inverse relationship in the short term. Same as (Andolfatto & Martin, 2018) debates on how could fiscal authority regime (Ricardian or non -Ricardian) influence central bank long-term inflation control.

From what we have discussed in the previous research analysis, the mutual influence of government debt and money in the economy becomes clear, since most studies touch on money in the broadest sense. The results of researchers vary, on the one hand, some establish a long-term relationship, and on the other hand, some deny the existence of mutual influence. Our work aims to limit the concept of money to the monetary base, which includes fast-circulating money, since it has a direct relationship with the price level, which in turn is affected.

**Theoretical background**

The gross public debt to GDP ratios reached their highest levels during the period 1990-2000, averaging 79.70%, with the lowest value in 2000 at 53.4% and the highest value in 1994 at 106.3%. The years 1995-1996 also defined values that exceeded 90%. This reflects the large size of the public debt compared to the internal product of Algeria, which experienced negative rates of development between the years 1991-1994 and the average percentage of internal product growth was 1.72% during this period, which is a weak percentage. This stage was characterized by average ratios of the monetary base to internal output, this is due to the restrictive policies imposed by the International Monetary Fund on Algeria within the framework of the agreements concluded between them, where the highest value of the monetary base ratio reached 61.77% in 1990 and then fell to a value that stabilized around 50% in the subsequent years between 1991-1994 and then decreased to 33% in 1996, and the average ratio of the monetary base during the period 1990-2000 was equal to the value of 44.26% and it is an acceptable value given the circumstances experienced by the families during that transitional period.(as shown in figure 01 and figure 02)

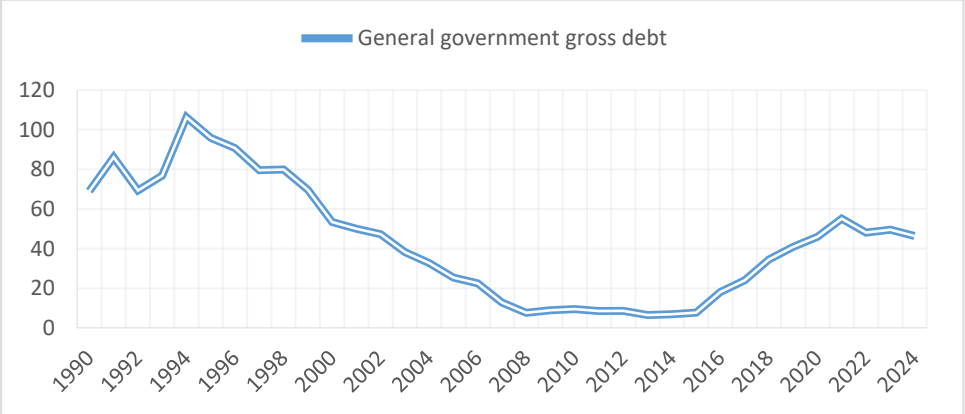



*Fig. 1. General government gross debt.*
*Source: Authors' calculations using data from the International Monetary Fund (IMF) International Financial Statistics Database, accessed on [12/01/2024].*

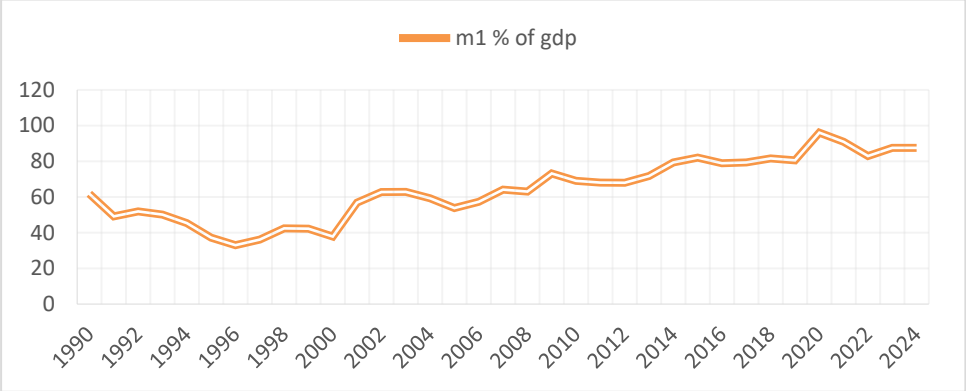



*Fig. 2. M1 (% of GDP)*
*Source: Authors' calculations using data from the International Monetary Fund (IMF) International Financial Statistics Database, accessed on [12/01/2024].*

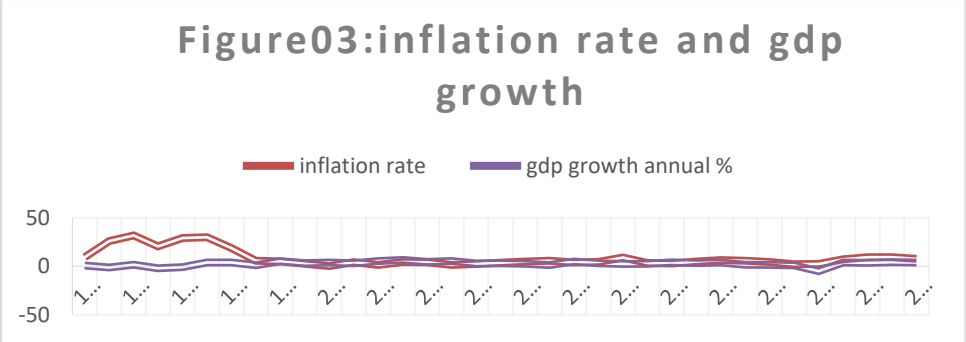



*Fig. 3. Inflation rate and GDP growth.*
*Source: Authors' calculations using data from the International Monetary Fund (IMF) International Financial Statistics Database, accessed on [12/01/2024].*

The high inflation rates during the period 1991-1997 reflected an imbalance in the economic situation in Algeria due to the launch of the new economic system in addition to the remnants of the previous socialist system. The average inflation rate during this period was 16.22% after the inflation rate declined during the period 1998-2000. However, the economic imbalance is evident in the period 1990-1997, which was characterized by high inflation rates compared to the rates of internal product development, which averaged 1.72% during the same period. (as shown in figure 03)

In the second stage (post 2000) Algeria moved on for new step to accomplish. Many reforms and challenges Especially with regard to the process of conducting monetary policy, in which the monetary and loan law 90-10 defined several amendments1 that gave broader powers to the monetary and loan Council and to the governor of the Bank of Algeria in conducting monetary policy. This stage is characterized by a continuous increase in the ratio of the monetary base to GDP, as it was known as a financial crisis due to the high prices of hydrocarbons, which are considered the largest resources of the Algerian economy. The average post-2000 period for the ratio of the development of the monetary base to internal output was 71.72%. The same stage was also marked by a gradual decline in the ratio of public debt to GDP from 53.4% in 2000 to 7.6% in

[1] One of the most important of these amendments, **Order03-11, of august 26,2003** which was as a fundamental change in the parameters of the monetary and loan law 90-10, and the most important of which was the granting of greater independence to the monetary and Loan Board and directly established a coordinating relationship between the Bank of Algeria and the government.

2008, which is a good indicator in the framework of general economic policies, and this was accompanied by several economic programs. After that, this indicator was stable between 7.6% - 8.6% until 2016, where it reached a value of 18.1%, which is explained by the results of the low oil prices crisis and the global crisis of 2008-2009, which resulted in economic stagnation and a decline in liquidity, which necessitated raising the volume of public debt to revive the economy and to ensure the continuation of the programmed development programs. The public debt ratios continued to reach a value of 55.1% in 2021, and the continued increase in this indicator can be explained by the adoption of Algeria's unconventional financing policy within the framework of the amendment of the monetary and loan law2 starting from October 2017. (as shown in figure 01 and figure 02)

Figure 03 shows clearly that during the period 2000-2007, the GDP growth rates were lower than the GDP growth rates, which is a good indicator. But during the subsequent period after 2008, inflation rates became higher than the rates of GDP growth, and this is reflected in the increase in the rates of the monetary base through figure 02

**Purpose, objectives and research methods.** This section is compulsory and it should provide specific description of the methodology

In this part of our study, we analyze the correlation between two variables (public debt and monetary base) using eviews.13 program. After analyzing the correlation results. We explore a simulation using a MATLAB to study the relationship between the two variables in the context of Algerian economic data.

A preliminary reading on the correlation between variables:

We started our standard study with a preliminary study of the correlation between variables through the eviews13 program to find out the extent of correlation between the study variables.

*Table.1 Correlation test*

| | Debt % of GDP | m1 % of GDP |
|---|---|---|
| Debt % of GDP | **1** | /////// |
| m1 % of GDP | **0.6335-** | **1** |

*Source: eviews 13 output.*

Correlation results show 63.35% negative link between government gross debt and monetary base (m1) in Algeria. This means that, as multiple earlier studies have shown (negative relationship) every one-point increase in the monetary base rate in relation to GDP or the public debt to GDP is has an inverse effect of (0.6335-) on the other variable.

3-2-An ARDL approach to assess the nexus between m1 and debt on Algeria:

Through the changes made to the country's loan and monetary laws, a number of stations were identified using both study variables in order to examine the effects of the financial authority's decisions regarding the form and amount of debt required to maintain the size of Algeria's monetary base between 1990 and 2024. Furthermore, this time frame was marked by a number of shocks that took the form of different crises (the fuel price crisis in 2014, the covid-19 issue, and the 2008 crisis). The study's concept originated from the fact that Algeria's economy lacks developed financial markets on which to trade a variety of financial assets. As a result, the total payments M1, also referred to as the monetary base, are the most significant variables impacted by the financial authority's non-Ricardian fiscal policy, which is centered on printing money to pay for public debt.

[2] Article 45 of the law **17-10, of october 17, 2017** allows the Bank of Algeria to print money as part of an unconventional financing policy for a period of five years.

Using ARDL3 aproach the model on which our study was built was as follows:
m1=∫(debt)

$$\Delta m1 = \delta_0 + \sum_{i=1}^{p} \delta_{1k} \Delta m1_{t-i} + \sum_{i=1}^{q} \beta_{2k} \Delta debt_{t-i} + + \psi_1 m1_{t-1} + \psi_2 debt_{t-1} + u_t$$

m1: monetary base(percent of gdp).dependent variable.
debt: gross government debt (percent of gdp).independent variable.

The data used in this study was sourced from the World Bank. The researchers then utilized the widely-used statistical software package, Eviews 13, to estimate

the model. This approach ensures a high degree of reliability and transparency, as both the data source and the statistical analysis method are clearly identified and readily available for scrutiny.

**Research results. Dickey and fuller unit root test:**

To determine the degree of stability, it is first necessary to conduct a stability study of the time series of the study variables. After automatically choosing the best slow intervals(AIC: Akaike Information Criterion), we will use the Dickey Fuller test, created by test Fuller Dickey Augmented (ADF), to determine the degree of integration of the study variables. Results showed that,the debt and m1 are Integrated first-class I(1) ,so we can use ARDL to check the co-integration**.**

*Table 2. dickey and fuller unit root test –level-*

| | level | | | | | |
|---|---|---|---|---|---|---|
| | intercept | | Trend and intercept | | none | |
| //////// | t value | prob | t value | prob | t value | prob |
| Debt | -3.7730 | 0.0087 | -0.6603 | 0.9682 | -1.4938 | 0.1245 |
| m1 | -0.7654 | 0.8153 | -3.8295 | 0.0278 | 0.3433 | 0.7783 |

*Source:made by authors depending on eviews13 outputs.*

*Table 3. dickey and fuller unit root test -1rst difference-*

| | level | | | | | |
|---|---|---|---|---|---|---|
| | intercept | | Trend and intercept | | none | |
| //////// | t value | prob | t value | prob | t value | prob |
| Debt | -5.4666 | 0.0001 | -5.7840 | 0.0002 | -5.4713 | 0.0000 |
| m1 | -5.6383 | 0.0001 | -5.4554 | 0.0006 | -5.5720 | 0.0000 |

*Source:made by authors depending on eviews13 outputs.*

*Table 4. The degree of integration of variables*

| Variables | m1 | debt |
|---|---|---|
| The degree of integration | I(1) | I(1) |

*Source: made by authors depending on eviews13 outputs.*

[3] ARDL) model is adaptable for time series research. It handles stationarity from entirely stationary (I(0)) to integrated of order one (I(1)) and even combinations of the two. ARDL is useful for analyzing long-term variable connections, especially in small datasets. HARDLY can estimate the short- and long-term effects of independent variables on the dependent variable in the same model, which is a major benefit. This lets researchers fully analyze variable dynamics. Due to its boundary-pushing design, ARDL can be employed when standard approaches are unsuitable.

$$\Delta y_t = \delta_0 + \sum_{i=1}^{p} \delta_k \Delta y_{t-i} + \sum_{i=1}^{q} \beta_k \Delta x_{t-i} + \psi_1 y_{t-1} + \psi_2 x_{t-1} + u_t$$

**Co-integration testing using the boundary approach:**

Significant F-bounds test findings. The 6.67 F-statistic exceeded the threshold values at 1%, 5%, and 10% significance levels. We reject the null hypothesis and confirm a long-term link between the variables with this strong evidence. This discovery lets us examine the long-term and short-term correlations between these factors in greater depth.

*Table 5. F-Bounds Test*

| Test Statistic | | | Value |
|---|---|---|---|
| F-statistic | | | 6.6744 |
| | 10% | 5% | 1% |
| Minimum values | 3.510 | 4.160 | 5.580 |

*Source:eviews13output.*

**Testing the optimal slowdowns of the model:**

That the Akaike Information Criterion established the model's best lag structure. This widely established statistical modeling criterion indicated 1.0 as the most efficient lag period. Figure 03 shows the model's ideal setup clearly.

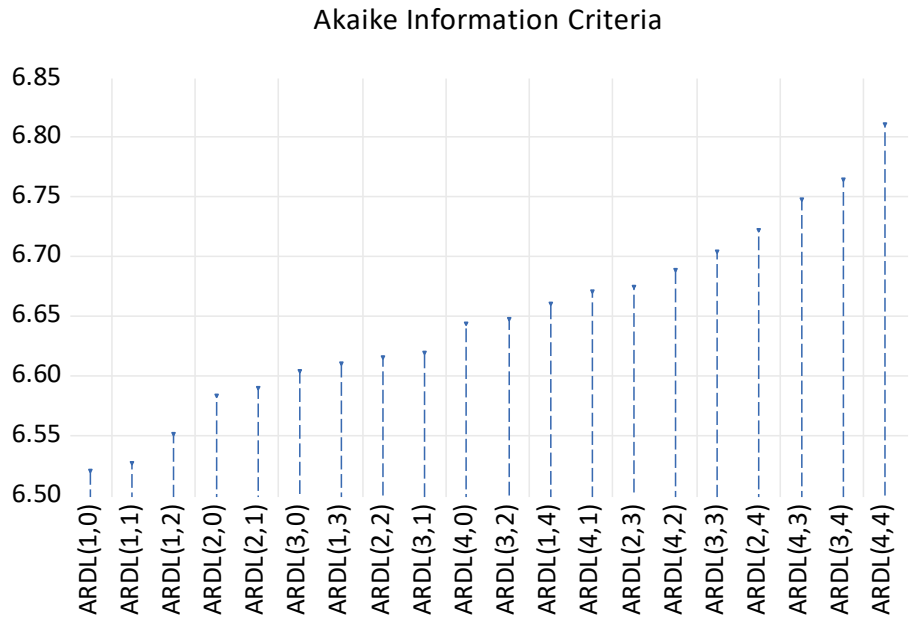



*Fig.: 4: akaike information criteria*
*Source: eviews13outputs.*

**Diagnostic tests of the model :**

Before adopting model findings, extensive testing is needed. Figures 05, 06, and 07 demonstrate Reviews 13 stability testing of this model. The cumulative sum (CUSUM) and CUSUM of squares tests, which assess model stability, show that residual values are inside the crucial zone at 5% significance. This indicates that the model is fundamentally solid and that short-term and long-term results are strongly correlated. Simply said the model is trustworthy and may be utilized to derive conclusions.

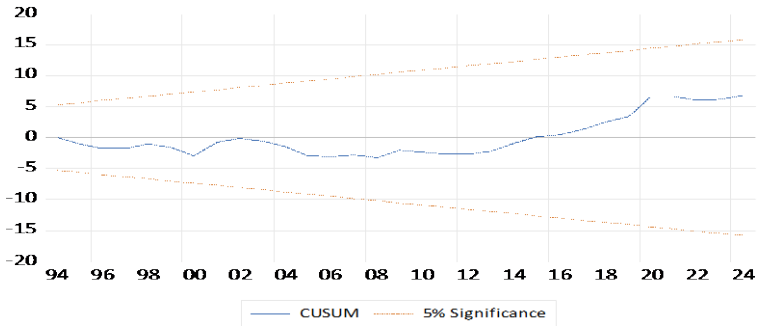



*Fig.: 5: cosum test.*
*Source: eviews13outputs.*

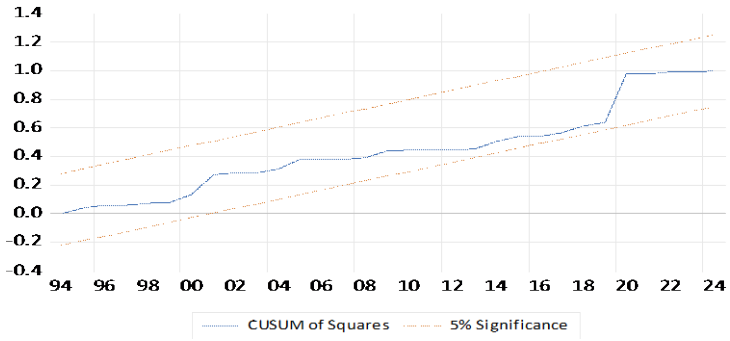



*Fig.: 6:cosum of squares test.*
*Source: eviews13outputs.*

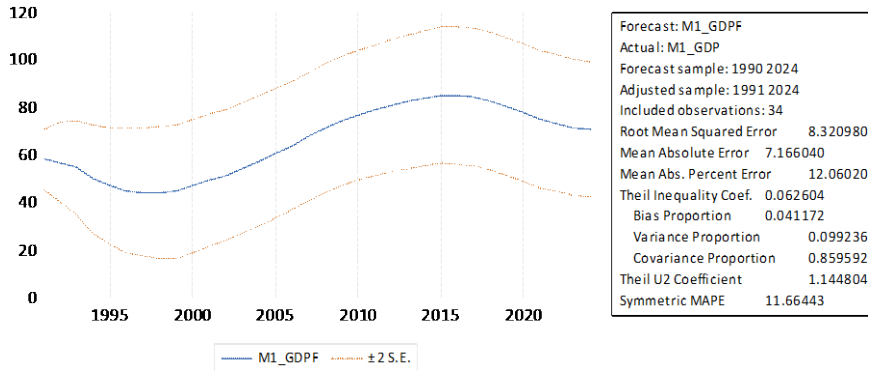



*Fig.: 7: DCPIF*
*Source : eviews13output.*

**Test for the existence of the autocorrelation problem and the variance instability problem:**

*Table 6. Breusch-Godfrey Serial Correlation LM Test:*

| Null hypothesis: Homoskedasticity | | | |
|---|---|---|---|
| F-statistic | 0.4102 | Prob. F (5,25) | 0.6673 |
| Obs*R-squared | 0.9354 | Prob. Chi-Square (2) | 0.6264 |

*Source: eviews13 outputs*

Table 3. Breusch-Godfrey test results are encouraging. The test showed no serial autocorrelation in models. The p-value of 0.6264 is considerably larger than 0.05, thus we accept

the null hypothesis. This implies model mistakes are not connected, which is necessary for good predictions.

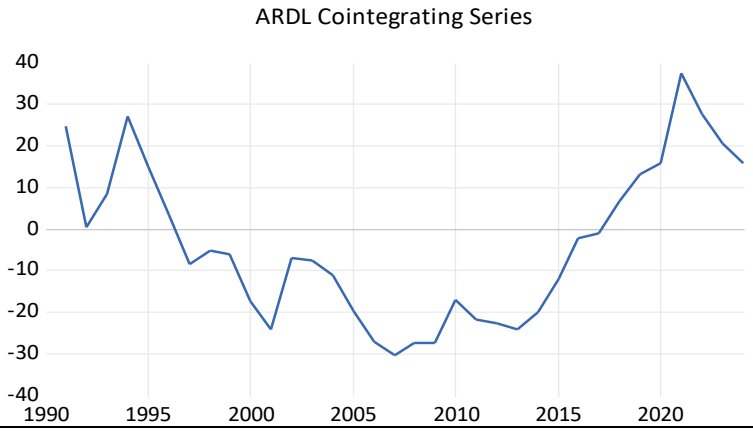
Additionally, the model passed the variance instability test, indicating that error variance remains steady across time. This is essential for model prediction accuracy.

*Table 7 Heteroskedasticity Test: Breusch-Pagan-Godfrey.*

| Null hypothesis: Homoskedasticity | | | |
|---|---|---|---|
| F-statistic | 0.574907 | Prob. F(5,25) | 0.7186 |
| Obs*R-squared | 3.196847 | Prob. Chi-Square(5) | 0.6697 |
| Scaled explained SS | 2.987048 | Prob. Chi-Square(5) | 0.7020 |

*Source: eviews13 outputs*

Heteroskedasticity Test, notably Breusch-Pagan-Godfrey, has shown model success. Since the chi-square value of 0.6697 is larger than 0.05, we accept the null hypothesis and find no heteroskedasticity (variance instability) in the model. Table 7 shows this critical discovery, verifying the model's accuracy and consistency.




| Deterministics: Rest. constant |
|---|
| CE = M1_GDP (-1) - (-0.692632*DEBT_GDP + 96.645508) |

*Fig. 8. ARDL cointegration series.*
*Source : Eviews 13 output*

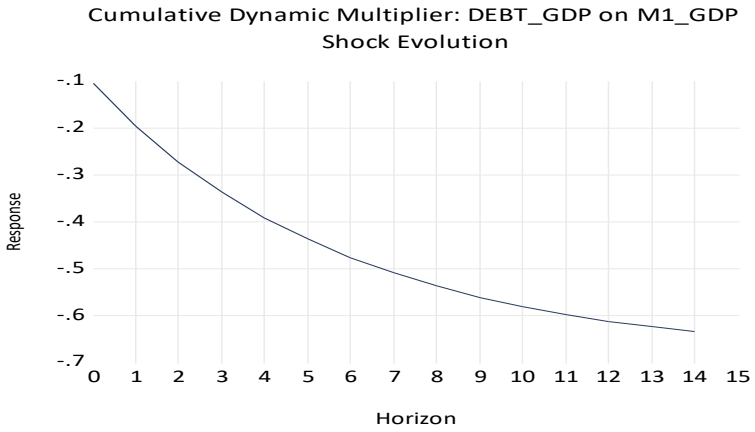



*Fig. 9. Cumulative Dynamic Multiplier.*
*Source : Eviews 13 output*

**Discussion.** In this part of our work, we run a simulation illustrating the link between the two variables across a horizon of 20 periods beginning from the initial year 2024, based on the findings of the ARDL emperical study. This simulation code could evaluate the model's overall fit

(measured by the R-squared value), which will indicate how well the model comprises for the Changes in M1 depending on the debt's lagged levels.

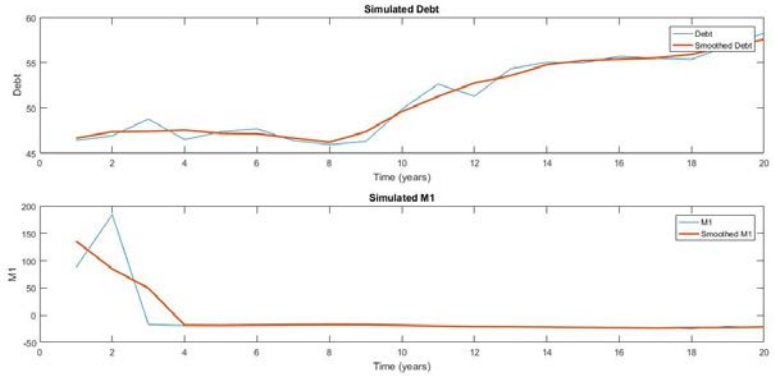



*Fig. 10. simulation results.*
*Source: computed by authors.*

The real simulated values are displayed by the observed M1 series. Depending on the lagged Debt variables, the ARDL model predicts values that are represented by the fitted M1 series. We may clearly evaluate the manner in which the model describes the dynamics of M1 through comparing these results. Furthermore, over the span of 20 period, the smoothed data aids in identifying the general patterns in M1 and Debt, and charts display any cyclical patterns or persistent rising or negative tendencies.

**Conclusions.** It should provide a neat summary and possible direction of future research. The checklist:

Our aim via this research document was to demonstrate the consequences of adopting a non-Ricardian fiscal policy, which is based on the amount of the national debt. Based on the Ardl approach and simulation using the Matlab program for a 20-year horizon, we examined the effects of changes in the ratio of the volume of gross public debt to the volume of GDP on a crucial variable in monetary policy represented by the monetary base. The most significant findings were as follows:

Results showed that The ARDL model coefficients show that lagged debt has a statistically significant negative effect on M1.The negative coefficient for Debt lag 1 indicates that higher Debt in the previous period is likely to have contributed to lower M1 in the current era. The coefficient (-0.692632) is significant (p-value < 0.05), indicating that Debt from the previous period has a strong negative impact on M1. A one-unit increase in Debt from the previous period results in a 0.692632 unit decrease in M1.

The non-Ricardian fiscal policy Algeria implemented, which relies on raising public debt ratios to satisfy budgetary constraints, shown in the adverse trend between the variables (m1 and government debt). This has a inverse effect on the volume of the monetary base, which is explained by the Bank of Algeria's intervention through the purchase of bonds corresponding to public debt. This reflects results of the ardl method.

As can be seen in Figure 10, the values for the simulated public debt follow the same pattern as the observed values, with a minor increase over the first eight periods and an upward trend in the debt ratios from the ninth stage until Stage 20. Regarding the relative's behavior, we have observed a progressive decline during the fi for m1 rst four stages, which coincides with a slight rise in the national debt at the same period. This illustrates the short-term effects of governmental debt on Algeria's monetary base; long-term effects are absent. The majority of these indicators accurately depict the state of the Algerian economy, which is renowned for its financial hegemony and well-coordinated overall economic policy led by the fiscal authority.

**References**

1. Filardo, A., Mohanty, M., & Moreno, R. (2012). Central bank and government debt management:issues for monetary policy. BIS Papers, 67, 51-71.
2. Garcia, V. F. (1998). Public Debt Sustainability and Demand for Monetary Base. IMF Working papers.
3. Romero, J. P., & Marín, K. L. (January-June, 2017). Inflation and Public Debt. Monetaria, 40-94.
4. Ahmed, H. A. (2019). Monetary base and federal government debt in the long-run: A non-linear analysis. Bulletin of Economic Research a, 1-18.
5. Andolfatto, D., & Martin, F. M. (2018). Monetary policy and liquid government debt. Journal of Economic Dynamics & Control, 89, 183-199.
6. BARTKOWIA, K. M., BOITAN, I. A., & CAMPEANU, E. M. (2020). Assessment of the Nexus between the Banking System and Government Debt Market: Past Trends and Future Challenges. Proceedings of the 3rd International Conference on Economics and Social Sciences, 908-916.
7. Beard, T. R., & McMillin, W. D. (1986). Government Budgets and Money: How Are They Related? The Journal of Economic Education, 17(2), 107-119.
8. Blommestein, H., & Turner, P. (2012). Interactions between sovereign debt management and monetary policy under fiscal dominance and financial instability. OECD Working Papers on Sovereign Borrowing and Public, 3, 1-28.
9. Dwyer, G. (Nov., 1985). Federal Deficits, Interest Rates and Monetary Policy. Journal of Money, Credit and Banking-Part 2: Monetary Policy in a Changing Financial Environment, 17(4), 655-681.
10. Leão, P. (july,2015). Is a Very High Public Debt a Problem? Levy Economics Institute of Bard College,, Working Paper No. 843, 1-23.
11. Leclaire, J. (2023). Modern money theory: some basics in response to Drumetz/Pfister. European Journal of Economics and Economic Policies: Intervention, 20(1), 34-42.
12. Ma, R., & Qamruzzaman, M. (2022). Nexus between government debt, economic policy incertainty, government spending, and governmental effectiveness in BRIC nations:evidence from linear and non linear assessments. Frontiers in ienvironmental sciences, 1-19.
13. Ryan-Collins, J. (october,2015). Is Monetary Financing Inflationary?A Case Study of the Canadian Economy, 1935–75. Levy Economics Institute of Bard College, Working Paper No. 848, 1-51.
14. Thadden, L. (june,2003). Active monetary policy, passive fiscal policy and the value of public debt: some further monetarist arithmetic. Economic Research Center of the deutsche bundesbank, Discussion paper 12/03.
15. Woodfrod, M. (August 1995). price level determinacy without control of monetary aggregate. NBER, workin paper n°5204, 1-40.
16. Afonso, A., Alves, J., & Balhote, R. (2019). Interactions between monetary and fiscal policies [Article]. Journal of Applied Economics, 22(1), 131-150. https://doi.org/10.1080/15140326.2019.1583309
17. Ahmed, H. A. (2020). Monetary base and federal government debt in the long-run: A non-linear analysis [Article]. Bulletin of Economic Research, 72(2), 167-184. https://doi.org/10.1111/boer.12216
18. Albonico, A., & Rossi, L. (2017). Inflation bias and markup shocks in a LAMP model with strategic interaction of monetary and fiscal policy [Article]. Journal of Macroeconomics, 52, 39-55. https://doi.org/10.1016/j.jmacro.2017.02.004
19. Azad, N. F., Serletis, A., & Xu, L. (2021). Covid-19 and monetary–fiscal policy interactions in Canada [Article]. Quarterly Review of Economics and Finance, 81, 376-384. https://doi.org/10.1016/j.qref.2021.06.009
20. Cevik, E. I., Dibooglu, S., & Kutan, A. M. (2014). Monetary and fiscal policy interactions: Evidence from emerging European economies [Article]. Journal of Comparative Economics, 42(4), 1079-1091. https://doi.org/10.1016/j.jce.2014.05.001
21. Chadha, J. S., & Nolan, C. (2019). On the interaction of monetary and fiscal policy. In Dynamic Macroeconomic Analysis: Theory and Policy in General Equilibrium (pp. 243-307). Cambridge University Press. https://doi.org/10.1017/9781139165235.007
22. Dimakou, O. (2015). Bureaucratic corruption and the dynamic interaction between monetary and fiscal policy [Article]. European Journal of Political Economy, 40, 57-78. https://doi.org/10.1016/j.ejpoleco.2015.07.004
23. Foresti, P. (2015). Monetary and debt-concerned fiscal policies interaction in monetary unions [Article]. International Economics and Economic Policy, 12(4), 541-552. https://doi.org/10.1007/s10368-014-0278-7
24. Foresti, P. (2018). MONETARY AND FISCAL POLICIES INTERACTION IN MONETARY UNIONS [Article]. Journal of Economic Surveys, 32(1), 226-248. https://doi.org/10.1111/joes.12194
25. Pacifico, A. (2021). Monetary policy regimes, fiscal implications, and policy interactions among developing economies. In Handbook of Research on Emerging Theories, Models, and Applications of Financial Econometrics (pp. 229-265). Springer. https://doi.org/10.1007/978-3-030-54108-8_10
26. Sargent, T. J., & Wallace, N. (1981). Some unpleasant monetarist arithmetic,* federal reserve bank of minneapolis quarterly review. SargentFederal Reserve Bank of Minneapolis Quarterly Review1981.
27. van Aarle, B., Bovenberg, L., & Raith, M. (1995). Monetary and fiscal policy interaction and government debt stabilization [Article]. Journal of Economics Zeitschrift für Nationalökonomie, 62(2), 111-140. https://doi.org/10.1007/BF01226006

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**Зв'язок між грошовою базою та державним боргом – емпіричні дані з Алжиру**

***Анотація.*** Складна взаємодія між монетарною та фіскальною політиками є вирішальною для макроекономічної стабільності, особливо в країнах, що розвиваються, таких як Алжир. Велика залежність Алжиру від доходів від нафти додає унікальний рівень складності, оскільки коливання світових цін на нафту значно впливають на державні фінанси. Це дослідження аналізує зв'язок між грошовою базою та державним боргом, що є важливим аспектом розуміння взаємодії фіскальної та монетарної політики в цьому контексті.

**Постановка проблеми.** Дослідження спрямоване на аналіз зв'язку між грошовою базою (M1) та державним боргом в Алжирі, досліджуючи, як цей зв'язок впливає на ефективність фіскальної та монетарної політики.

**Нерозв'язані аспекти.** Нерозв'язаним питанням у нашій роботі є реальна динаміка між фіскальною та монетарною політиками у сфері управління державним боргом.

**Мета статті.** Розуміючи цей зв'язок, дослідження прагне надати цінні висновки для політиків щодо потенційних наслідків їхніх рішень та важливості координації для досягнення довгострокової макроекономічної стабільності.

**Основний матеріал.** У дослідженні застосовується економетричний підхід часових рядів з використанням моделі авторегресійного розподіленого лагу (ARDL). Цей підхід дозволяє аналізувати довгострокову коінтеграцію між грошовою базою та державним боргом, використовуючи дані з 1990 по 2024 роки. Аналіз також включає симуляцію з використанням MATLAB для візуалізації зв'язку між цими двома змінними на горизонті 20 років.

**Висновки.** Результати аналізу ARDL вказують на статистично значущий негативний зв'язок між відставленим державним боргом та M1, що свідчить про те, що вищі рівні державного боргу в попередньому періоді призводять до зменшення грошової бази в поточному періоді. Цей результат вказує на те, що нерікардіанська фіскальна політика Алжиру, яка залежить від збільшення частки державного боргу для задоволення бюджетних обмежень, має значний вплив на грошову базу. Результати симуляції додатково ілюструють короткострокові ефекти державного боргу на грошову базу Алжиру, підкреслюючи необхідність ретельної координації між фіскальною та монетарною політиками для забезпечення довгострокової макроекономічної стабільності.

***Ключові слова:*** *Алжир, грошова база, фіскальна політика, симуляція, державний борг.*
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**Список літератури**

1. Filardo A., Mohanty M., Moreno R. Central bank and government debt management: issues for monetary policy. BIS Papers. 2012. Vol. 67. P. 51–71.
2. Garcia V. F. Public Debt Sustainability and Demand for Monetary Base. IMF Working Papers. 1998.
3. Romero J. P., Marín K. L. Inflation and Public Debt. Monetaria. 2017. January–June. P. 40–94.
4. Ahmed H. A. Monetary base and federal government debt in the long-run: A non-linear analysis. Bulletin of Economic Research. 2019. P. 1–18.
5. Andolfatto D., Martin F. M. Monetary policy and liquid government debt. Journal of Economic Dynamics & Control. 2018. Vol. 89. P. 183–199.
6. Bartkowia K. M., Boitan I. A., Campeanu E. M. Assessment of the Nexus between the Banking System and Government Debt Market: Past Trends and Future Challenges. Proceedings of the 3rd International Conference on Economics and Social Sciences. 2020. P. 908–916.

7. Beard T. R., McMillin W. D. Government Budgets and Money: How Are They Related? The Journal of Economic Education. 1986. Vol. 17. No. 2. P. 107–119.
8. Blommestein H., Turner P. Interactions between sovereign debt management and monetary policy under fiscal dominance and financial instability. OECD Working Papers on Sovereign Borrowing and Public. 2012. No. 3. P. 1–28.
9. Dwyer G. Federal Deficits, Interest Rates and Monetary Policy. Journal of Money, Credit and Banking-Part 2: Monetary Policy in a Changing Financial Environment. 1985. Vol. 17. No. 4. P. 655–681.
10. Leão P. Is a Very High Public Debt a Problem? Levy Economics Institute of Bard College. Working Paper No. 843. 2015. P. 1–23.
11. Leclaire J. Modern money theory: some basics in response to Drumetz/Pfister. European Journal of Economics and Economic Policies: Intervention. 2023. Vol. 20. No. 1. P. 34–42.
12. Ma R., Qamruzzaman M. Nexus between government debt, economic policy uncertainty, government spending, and governmental effectiveness in BRIC nations: evidence from linear and non-linear assessments. Frontiers in Environmental Sciences. 2022. P. 1–19.
13. Ryan-Collins J. Is Monetary Financing Inflationary? A Case Study of the Canadian Economy, 1935–75. Levy Economics Institute of Bard College. Working Paper No. 848. 2015. P. 1–51.
14. Thadden L. Active monetary policy, passive fiscal policy and the value of public debt: some further monetarist arithmetic. Economic Research Center of the Deutsche Bundesbank. Discussion Paper 12/03. 2003.
15. Woodford M. Price level determinacy without control of monetary aggregate. NBER Working Paper No. 5204. 1995. P. 1–40.
16. Afonso A., Alves J., Balhote R. Interactions between monetary and fiscal policies. Journal of Applied Economics. 2019. Vol. 22. No. 1. P. 131–150. https://doi.org/10.1080/15140326.2019.1583309
17. Ahmed H. A. Monetary base and federal government debt in the long-run: A non-linear analysis. Bulletin of Economic Research. 2020. Vol. 72. No. 2. P. 167–184. https://doi.org/10.1111/boer.12216
18. Albonico A., Rossi L. Inflation bias and markup shocks in a LAMP model with strategic interaction of monetary and fiscal policy. Journal of Macroeconomics. 2017. Vol. 52. P. 39–55. https://doi.org/10.1016/j.jmacro.2017.02.004
19. Azad N. F., Serletis A., Xu L. Covid-19 and monetary–fiscal policy interactions in Canada. Quarterly Review of Economics and Finance. 2021. Vol. 81. P. 376–384. https://doi.org/10.1016/j.qref.2021.06.009
20. Cevik E. I., Dibooglu S., Kutan A. M. Monetary and fiscal policy interactions: Evidence from emerging European economies. Journal of Comparative Economics. 2014. Vol. 42. No. 4. P. 1079–1091. https://doi.org/10.1016/j.jce.2014.05.001
21. Chadha J. S., Nolan C. On the interaction of monetary and fiscal policy. In: Dynamic Macroeconomic Analysis: Theory and Policy in General Equilibrium. Cambridge: Cambridge University Press, 2019. P. 243–307. https://doi.org/10.1017/9781139165235.007
22. Dimakou O. Bureaucratic corruption and the dynamic interaction between monetary and fiscal policy. European Journal of Political Economy. 2015. Vol. 40. P. 57–78. https://doi.org/10.1016/j.ejpoleco.2015.07.004
23. Foresti P. Monetary and debt-concerned fiscal policies interaction in monetary unions. International Economics and Economic Policy. 2015. Vol. 12. No. 4. P. 541–552. https://doi.org/10.1007/s10368-014-0278-7
24. Foresti P. Monetary and fiscal policies interaction in monetary unions. Journal of Economic Surveys. 2018. Vol. 32. No. 1. P. 226–248. https://doi.org/10.1111/joes.12194
25. Pacifico A. Monetary policy regimes, fiscal implications, and policy interactions among developing economies. In: Handbook of Research on Emerging Theories, Models, and Applications of Financial Econometrics. Springer, 2021. P. 229–265. https://doi.org/10.1007/978-3-030-54108-8_10
26. Sargent T. J., Wallace N. Some unpleasant monetarist arithmetic. Federal Reserve Bank of Minneapolis Quarterly Review. 1981.
27. van Aarle B., Bovenberg L., Raith M. Monetary and fiscal policy interaction and government debt stabilization. Journal of Economics Zeitschrift für Nationalökonomie. 1995. Vol. 62. No. 2. P. 111–140. https://doi.org/10.1007/BF01226006

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# The effect of Eurozone carbon futures price on stock market price performance

***Abstract.*** the contemporary central role of carbon compliance in business operations on financial markets is garnering impetus with expansions in carbon compliance.

The objective of this paper is to examine the effect of Eurozone Carbon Futures Market (Carbon Emissions Futures [CFI2M5]) price on EU Stock Market (Euro Stoxx 50 - STOXX50E) Price Performance.

**Problem statement.** research on the interaction between the Carbon Emissions Futures Market and the financial market is growing with diversity of findings among researchers from different economic regions.

**Purpose of the article.** The goal of this article therefore is to evaluate whether the price of Carbon Futures market affects the price of conventional stock market, the magnitude and the direction of the impact.

**Unresolved aspects of the problem.** Existing gap in the problem is on the scarcity of focussed research on Carbon Futures price and Stock Market price within the Eurozone, which is the global pace setter of carbon market.

**Presentation of the main material.** Data for the analysis was collected over a period of 124 days between January and June 2025 for EU Carbon Futures (CFI2M5) and EU stock market (STOXX50E). The data was analysed using the simple regression model.

**Conclusions.** Findings show a P-value of 0.006, which is lower than the test alpha of 0.05 with regression coefficients of 9.977 which thus indicates a significant and positive relationship. This shows that a 1% increase in the EU Emissions Futures is likely to cause a 9.977 increase in the Euro Stoxx 50 price. The paper provides important implication for corporate decision makers, and Carbon Futures and stock market analysis and participants. It provides an agenda for further research to examine intercontinental variations between carbon futures market and stock market.

***Keywords:*** *Sock exchange, Carbon market, Share Price, Eurozone, Emission trading, Carbon price, share price, carbon accounting, carbon finance*

***JEL Classification****: Q51, Q54, G18, G13, C58, C22*

Formulas: 1; fig.: 3; tabl.: 1; bibl.: 19.

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**Introduction.** Carbon emission futures market is one of the pillars that support corporate motivation to comply with carbon reduction compliance requirements (Colmer, Martin, Muûls & Wagner, 2025). The global campaign and advocacy for environmental sustainability comes with diverse economic, financial, accounting and legal implications. For the corporate who is generally seen as the largest emitter of greenhouse gases Callahan and Mankin (2025), they are entwined within the complex web of both implications, which amongst others – the corporate gives final consideration to the accounting and financial implications of the choice of cutting down on carbon emission or holding onto the status quo. Either way, there are financial cost implications, and a wrong choice may either push the company out of business due to the loss in competitive advantage that comes with proven reduction in environmental responsibility or be cut up with huge regulatory penalties and/or suspensions – which may plummet corporate revenue, shrink profitability, corrode legitimacy and loss of market value stock Gabr and ElBannan (2025); Zhang and Han (2025). Contemporary evidence is ubiquitous which points to the fact that climate change policies are contributing to have a significant impact corporate stock return. For example, research results by Antoniuk and Leirvik (2024) show that the clean energy industries benefitted as a result of the Paris climate Agreement, the Climategate, and the Fukushima climate events because these measures amplified the investors' climate change consciousness and support for corporate policies geared to reducing the influence of climate change. Therefore, modern shareholders are constantly embracing the inevitable threat posed by loss of invested capital that may result from continued neglect to national or international corporate carbon reduction requirements. Hence, the shareholders are growing in support to carbon responsibility compliance. Among other avenues, one of the growing opportunities for the corporate to comply with carbon emission requirements is through the participation in carbon futures market of which the well know EU Emissions Trading System (EU ETS) carbon market (Günther et al., 2025).

Therefore, achieving corporate financial goals in the contemporary carbon compliance business environmental should require a balanced approached between carbon regulatory compliance and targeted financial goals. Hence regulations for protecting the environment are becoming more stringent against the larger backdrop of carbon peaking and carbon neutrality objectives. In the face of numerous environmental lawsuits and high government regulatory risks, corporate environmental compliance becomes essential to a successful business. One essential component of corporate environmental compliance is to ensure that the carbon regulatory requirements are adhered to and integrated into corporate operations and governance. Accordingly, corporate establishment of a diverse environmental governance framework that includes social participation enterprise self-discipline and government regulation is necessary (Zhang & Han, 2025).

Financial agreements known as carbon emissions futures give participants the option to purchase or sell the right to release a specific quantity of carbon dioxide (or its equivalent in other greenhouse gases) at a fixed price and future date. Caron futures markets are vital parts of the overall carbon trading market, which is a market-based mechanism that assigns monetary value to carbon emission. The overall aim of caron futures market is to incentivise and encourage carbon emission reductions. Therefore, carbon futures market essentially enable businesses and investors to control the monetary risk related to carbon prices and possibly make profits from their emission reduction efforts.

There is growing evidence from the Asian studies about likely interaction effects between the carbon futures market and the stock market. As an instance, a China study on market interaction between carbon trading market and stock market found that increases in carbon market price affects the stock price especially on the stock price of energy intensive and financial companies (Wen, Zhao & Yang, 2020). But studies the effect of EU ETS market price on stock prices are not very common within current year, therefore, this paper bridges this gap in knowledge and provides a latest evidence of the impact of carbon futures market on the stock market price. This will

contribute to the literature and assist stock market investors in monitoring and guarding their investment risks by taking a constant study and analysis of the carbon futures trend.

**Literature review.** Some researchers have examined the possibility of predicting the price of carbon futures to enable investors and operators to benefit from hedging and financial risk management. As an instance in a research conducted by Kumar (2024), the price of carbon emission futures is predicted using a variety of techniques such as machine learning algorithms and conventional ARIMA models. They used data spanning from 2005 to 2023 and included factors like GDP per capita carbon emissions crude oil and natural gas futures the Dow Jones Industrial Average and industrial indices. They discover that the prices of carbon futures and economic indicators are significantly correlated.

Using disclosed carbon intensity data Enders et al. (2025) investigate how carbon transition risk affects equity prices in the US and Europe. They discover a negative carbon premium and a negative impact on the cross section of returns for the 2009–2019 timeframe. By looking at fund flows they discover that institutional investors disapproved of carbon-intensive stocks which may help to explain why green stocks performed better. This negative carbon premium vanishes following the Paris Agreement and a positive premium is anticipated going forward. We use an asset-pricing method to calculate an assets exposure to carbon risk.

The effects of the carbon emission trading policy on information transmission were examined by Yuan et al. (2025) from a variety of approaches. They applied the difference-in-differences (DiD) approach to analyze data from A-share listed companies and found that Chinas CETS policy mitigates information asymmetry among listed companies in the pilot regions. Even after conducting numerous robustness tests Yuan et al. (2025) conclusion remains valid. According to their study's mechanism analysis, the CETS policy can: (1) increase the legitimacy of corporate disclosure of carbon information (2) reduce information asymmetry through the trading signals in the carbon market and (3) ensure that the CETS policy operates effectively through active government participation.

Businesses must support sustainable development as required by expanding multilateral and national environmental regulations. At the international level agreements, many countries have committed to limiting their greenhouse gas emissions under the Paris Agreement. Under the agreement, the expected maximum limit for global warming is 2 °C but 1.5 °C is thought to be the more desirable target. For manufacturing industries, large production companies, and factories that use a lot of energy, carbon futures have become an essential resource (Griffin et al., 2016). For these big businesses controlling the rising risk of carbon futures prices is essential. However, current US withdrawal from the Paris climate agreement may affect international and national climate governance with a ripple effect on carbon emissions and their futures markets (Swain et al., 2025). In related research conducted using the EU market, Wei and Lin (2016) examined how the European carbon market interact with oil futures and stock futures. To comprehend how the carbon market interacts with these other financial markets, they investigated the relationship between carbon and other asset classes such as the stock and oil markets. According to their empirical findings, the shock and oil returns does have a positive impact on the returns of carbon futures. In first observation, the stock market benefits from an oil price shock. The BEKK models multivariate generalized autoregressive conditional heteroskedasticity (GARCH) shows that while the oil market influences the volatility of the other two markets it is significantly less influenced by them.

Other researchers such as Ma et al. (2020) applied the DCC-MVGARCH model and built a modelling of Chinsese capital, energy and carbon emission trading markets from the standpoint of power consumption. It then analysed the dynamic linkage of the three markets. Their findings demonstrate that the dynamic correlation has notable time-varying and persistent characteristics and the price fluctuation of the yield series of products in each market exhibits clustering characteristics. There is essentially a constant dynamic conditional correlation between the carbon emission trading market and the natural gas market and the oil market. Yet in their analysis, on the interaction

between carbon, stock, and renewable energy markets, [Qiu et al. (2023) found that over time there is virtually no connectivity between the carbon market and the stock market or the market for renewable energy. Second with values of and respectively they conclude that COVID-19 short-term improves the positive connectivity between the stock market and carbon market and the market for renewable energy to carbon market. Finally, the carbon market had a more detrimental effect on the renewable energy market during COVID-19 than it did when the European Green Deal was announced but Brexit permitted the price of renewable energy to rise in tandem with the price of carbon.

One of the important studies on carbon trading market effect on stock price market was conducted by (Wen, Zhao & Yang, 2020). Their findings yield significant insight for understanding the interplay between carbon market and stock market. Accordingly, using the nonlinear auto-regressive distributed lag (NARDL) model Wen, Zhao & Yang (2020) **[7]**] examined the asymmetric relationship between the Chinese stock market and carbon emission trading market. Their analysis of the Chinese stock market at both the sector and overall levels produced intriguing and compelling empirical findings that demonstrate the long-term and short-term asymmetric relationships between the carbon emission trading market and the Chinese stock market as a whole are substantially negative. When they traced the effects from the carbon market to the stock market, they found that rising carbon emission trading prices had a bigger impact on stock prices than falling ones. Additionally, the stock market for the financial sector and certain energy-intensive sectors are strongly correlated with the price of carbon emissions at the sector level. Additionally, they discovered no discernible correlation between Chinas stock index and carbon emission trading price either at the sector or overall stock market levels [Wen, Zhao & Yang, 2020 **[7]**]. Their detailed findings include the following specifics: they observed that carbon trading market exhibit a long-run asymmetric negative effect on the stock market when tested at both the 1% and 5% levels of significance. From their findings, they conclude that a 1% increase in the carbon emission trading price would result to a 0.956% decrease in the general stock market; but a 1% decrease in carbon emission trading price would cause a 0.880% increase in the general stock market. This implies that from the findings there is a negative relationship which exists between Chinese carbon trading market price and the Chinese general stock market price. Therefore, using the EU ETS, this paper hypothesizes as follows:

HI: the EU Carbon Futures price affects the EU stock market price.

**Purpose, objectives and research methods.** Researchers find multiple evidence of diverse interactions between the carbon emission market and other markets (Wei & Lin, 2016; Wen et al., 2020). This cross-market interactions warrant that policy makers are aware of such and more events around the carbon and other markets and their latent effect on the corporate stock markets. This is because investors would consider potential climate related risks along with some expected market sector growths in making their overall investment decisions. Therefore, the purpose of this article is to provide a focussed insight into the effect of EU carbon futures market price on stock market price. The core objective thus is to examine if the Carbon Market Futures Price has any effect on the stock market price, and the direction of the effect thereof.

Such awareness will not only contribute to existing literature, but it will also in addition assist corporate decision makers, investors, analyst and researchers on the stock market reaction to changes in Carbon Futures price. Hence the findings of the paper will provide additional information for stock market investment decisions, hedging and climate related financial risk management when considering stock related decisions. Overall, the findings from this article aims to enlighten decision-makers and investors on the need to incorporate carbon market price performance variables into conventional corporate portfolio management analysis and decisions.

This paper applied a mix of review and quantitative approach. Firstly, the related literature to carbon futures market was reviewed. The literature was closed with a hypothesis which is tested under the quantitative analysis of data that follows below. The paper focused on the popular EU

Emissions Future Market which is the largest carbon futures market in the world (Rabe, Streimikiene & Bilan, 2019). Therefore, data for the analysis was collected for EU Carbon Emission Futures (Carbon Emissions Futures (CFI2M5) and EU stock market price index (Euro Stoxx 50 (STOXX50E). The two data sets were retrieved from the market price index archives of (Fusion Media, 2025a & 2025b). The Carbon Emission Futures contract, which is coded as CFI2M5 falls under the European Union Emission Trading System (or EU ETS). It is one of the important tools designed by the EU to target the achievement of its climate goals such as the target for net-zero emissions by the year 2050.

The hypothesis is restated below as:

HI: the EU Carbon Futures price affects the EU stock market price.

The hypothesis testing is used to achieve the objective of this paper which is to examine the effect of the EU Carbon Emission Futures on EU stock market.

For both variables, data was collected for 124 days from January to June 2025.

Following the simple model specification by Ross (2021), the analysis was conducted with a simple regression analysis using the following model:

$$y = \beta 0 + \beta X + Є \quad (1)$$

Where:

$y$ = stock market price (dependent variable or predicted variable)

X = EU Emissions Futures Price (independent variable or predictor variable)

B = gradient (or regression coefficient)

β0 = constant (or intercept)

Є = error term

**Research results.** Analysis was conducted at an alpha of 0.05 using the excel software. Table 1 presents the results of the regression analysis showing the effect of EU Emission Futures price (which is the EUCarbon Emissions Futures CFI2M5 (the independent variable) on the EU stock price, which is the Euro Stoxx 50 (STOXX50E) being the dependent variable in this analysis. The results indicate a P-value of 0.006, which is far lower than the test alpha of 0.05 with regression coefficients of 9.977 which indicates a significant positive relationship. This shows that a 1% increase in the EU Emissions Futures is likely to cause a 9.977 increase in the Euro Stoxx 50 price (all other impacting variables being equal). Figure 1 provides a pictorial view of the relationship in a line chart which shows a corresponding movement of the X and Y variables. Therefore, the hypothesis is accepted which implies that within the short-run (half year of 2025) data used for the EU ETS and Euro Stoxx 50 price, the former affects the later positively and significantly.

*Table 1 Regression results of the Effect of EU Emission Futures (X) on EU Stock Price (Y)*

| ANOVA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *df* | *SS* | *MS* | *F* | *Significance F* | | | |
| Regression | 1 | 285621.0526 | 285621.1 | 7.541331 | 0.006943013 | | | |
| Residual | 122 | 4620639.329 | 37874.09 | | | | | |
| Total | 123 | 4906260.382 | | | | | | |
| | | | | | | | | |
| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 4557.237575 | 260.0824242 | 17.52228 | 4.12E-35 | 4042.37844 | 5072.097 | 4042.3784 | 5072.09671 |
| CarbonFuturesPrice | 9.977531253 | 3.633282014 | 2.746148 | 0.006943 | 2.785086619 | 17.16998 | 2.7850866 | 17.1699759 |

*Source: author's statistical analysis .*

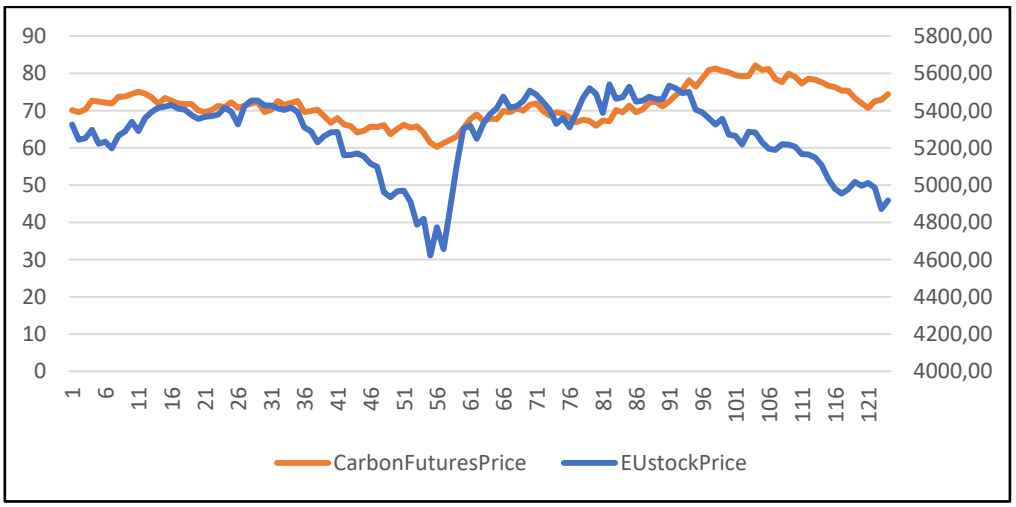


*Figure 1 Line graph of the effect of EU Emission Futures (X) on EU Stock Price (Y)*
*Source: author's development.*

**Discussion.** The above results from the analysis of data present the paper's findings, which reveals an important inter-price interacting movement between the EU Carbon Futures Market (EUCarbon Emissions Futures CFI2M5) and the EU stock market (Euro Stoxx 50 (STOXX50E). The relationship between these two unrelated markets is both informative and attention directing.

It is informative because the findings contribute to broaden our understanding of how a relationship exists between two unrelated markets (carbon future, which is a market that targets the provision of permission or contract to emit carbon) and (a stock market where equity capital – which corporate ownership shareholding is traded).

Albeit their unrelatedness in the nature, scope and purpose of their existence, but this finding brings to the fore an echo of the efficient market hypothesis, which among other important postulates hints on the power of response stimuli of the stock market to every informative around its environment. In this instance the stock market can and does respond to carbon futures' price fluctuation information at a positive and significant level. The findings also add additional angle of clarity to existing knowledge – especially given that previous researchers have combined up to three different markets in examining the effect of caron futures market or effect on carbon futures market.

It is worth mentioning insight depicted in Figure 2 and Figure 3, which shows in clustered bar graph that changes in Figure 2 (carbon futures) orchestrates (in most of the trends) an amplified effect on Figure 3, which means that movements in Futures Market causes a ore than proportionate positive effect on stock market. This salient and unique effect has not been made conspicuous in earlier research especially within the EU Futures market environment.

This finding is different from the negative findings observed by Wen et al. (2020) when they used the Chinese ETS data. Their findings indicate that the Chinese carbon market affects the Chinese stock market negatively, however, within the bounds of this current paper, the opposite is the case. This finding has important implication for stock market practitioners, investors and scholars. The finding sheds light toward understanding the different dynamics that might be playing out regarding the relationship between emissions futures and stock markets – showing that the interaction between these variables might differ across regions depending on other factors beyond the scope of this paper. Accordingly, further research is encouraged for intercontinental study that might discover other variables that create differences in relationships among different futures markets located in different continents. This result contributes to the literature as it brings another view of the relationship using a current market data.

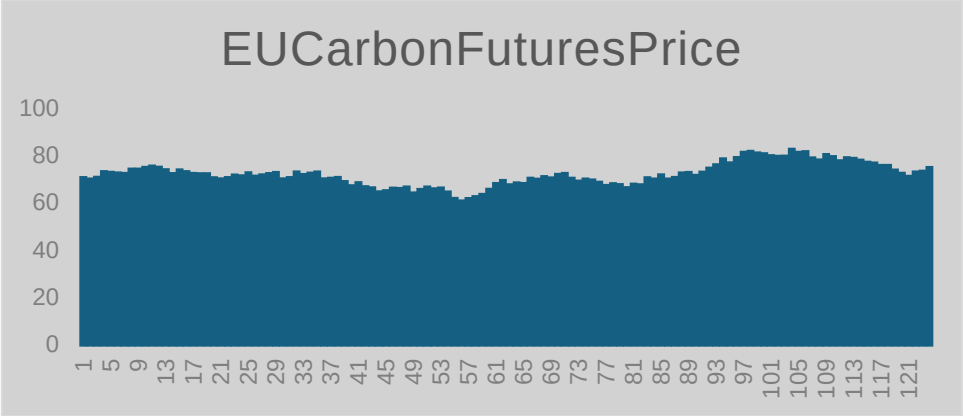


*Figure 2 Clustered Colum graph of EU Carbon Futures Price*
*Source: author's development.*

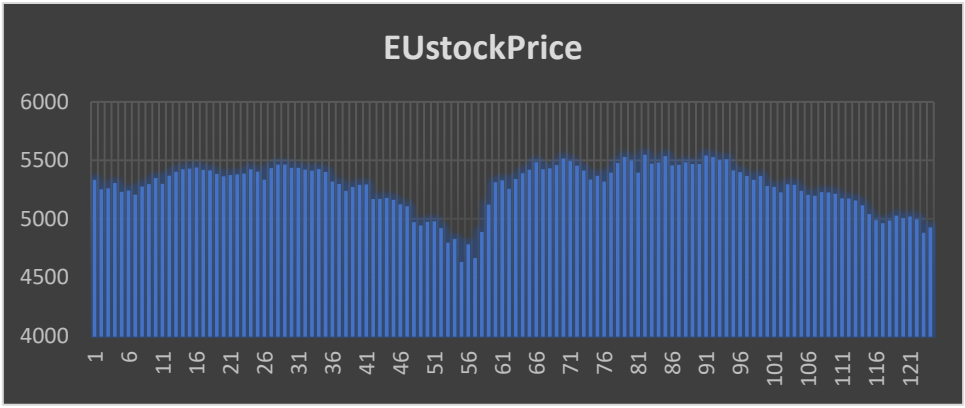


*Figure 3 Clustered Colum graph of EU Stock Price*
*Source: author's development.*

**Conclusions.** Carbon Emission Futures Market is one of the novel tools designed by the European Union to curb carbon emission with a view to achieving future targets of net tolerable emissions in tandem with sustainable development and climate change advocacy.

Given that Carbon Emission Futures affects corporate operations in addition to offering an income creation avenue through the purchase and selling of carbon contracts, it thus has some spill-over interaction with the capital markets such as the stock exchange market. Hence researchers have been researching on diverse aspects of interaction between the Carbon Futures Market and the Stock Market. Therefore, evidence from existing literature suggest various interactions between the carbon emission market the stock markets (Wei & Lin, 2016; Wen et al., 2020). Therefore, the purpose of this paper was to contribute to existing research by focussing the paper on the effect of EU Carbon Futures Markets on EU Stock Market.

The findings reveal a unique interaction based on the timeframe and within the EU Carbon Futures and EU Stock Market Price. Specifically, at an alpha value of 0.05, the findings show a P-value of 0.006, and given that this probability value is way lower than the stated test alpha of 5%(0.05) along with a corresponding regression Beta of 9.977, it thus depicts a significant and positive effect of Carbon Futures on Stock price. This finding therefore led to the acceptance of research hypothesis that Carbon Futures Market may have an effect on the stock market. The line graph also substantiates the statistical analysis by showing how increases and decreases in Carbon Futures result in the same movement in stock price.

This paper contributes to the literature by providing additional information required by corporate decision makers, stock investors, analyst and researchers on the stock market reaction to fluctuations in Carbon Futures price. Therefore, this paper provides insight for stock market investment decisions, hedging and climate related financial risk management. Since this paper was

limited to one independent variable used to assess its impact on stock market, the paper recommends further research of an intercontinental genre to use multiple variables which may uncover the variable/s that create intercontinental differences in the interaction between Carbon Futures Market and Stock market.

**References**

1. Antoniuk, Y., & Leirvik, T. (2024). Climate change events and stock market returns. *Journal of Sustainable Finance & Investment*, *14*(1), 42-67.
2. Callahan, C. W., & Mankin, J. S. (2025). Carbon majors and the scien tific case for climate liability. *Nature*, *640*(8060), 893-901.
3. Colmer, J., Martin, R., Muûls, M., & Wagner, U. J. (2025). Does pricing carbon mitigate climate change? firm-level evidence from the european union emissions trading system. *Review of Economic Studies*, *92*(3), 1625-1660.
4. Enders, A., Lontzek, T., Schmedders, K., & Thalhammer, M. (2025). Carbon risk and equity prices. *Financial Review*, *60*(1), 13-32.
5. Fusion Media (2025) Investing.com, Carbon Emissions Futures - Jun 2025 (CFI2M5), Retrieved from: https://za.investing.com/commodities/carbon-emissions-historical-data
6. Fusion Media (2025b) Investing.com, Euro Stoxx 50 (STOXX50E), Retrieved from: https://za.investing.com/indices/eu-stoxx50-historical-data
7. Gabr, D. H., & ElBannan, M. A. (2025). Is it worth it to go green? ESG disclosure, carbon emissions and firm financial performance in emerging markets. *Review of Accounting and Finance*, *24*(2), 193-217.
8. Griffin, P. W., Hammond, G. P., & Norman, J. B. (2016). Industrial energy use and carbon emissions reduction: a UK perspective. *Wiley Interdisciplinary Reviews: Energy and Environment*, *5*(6), 684-714.
9. Günther, C., Pahle, M., Govorukha, K., Osorio, S., & Fotiou, T. (2025). Carbon prices on the rise? Shedding light on the emerging second EU Emissions Trading System (EU ETS 2). *Climate Policy*, 1-12,https://doi.org/10.1080/14693062.2025.2485196
10. Kumar, N., Kayal, P., & Maiti, M. (2024). A study on the carbon emission futures price prediction. *Journal of Cleaner Production*, *483*, https://doi.org/10.1016/j.jclepro.2024.144309
11. Ma, Y., Wang, L., & Zhang, T. (2020). Research on the dynamic linkage among the carbon emission trading, energy and capital markets. *Journal of Cleaner Production*, *272*, 122717, https://doi.org/10.1016/j.jclepro.2020.122717
12. Qiu, L., Chu, L., Zhou, R., Xu, H., & Yuan, S. (2023). How do carbon, stock, and renewable energy markets interact: Evidence from Europe. *Journal of Cleaner Production*, *407*, 137106, https://doi.org/10.1016/j.jclepro.2023.137106
13. Rabe, M., Streimikiene, D., & Bilan, Y. (2019). EU carbon emissions market development and its impact on penetration of renewables in the power sector. *Energies*, *12*(15), 2961.
14. Ross, S.M. (2021) Regression. In Ross, SM (Ed.) *Introduction to Probability and Statistics for Engineers and Scientists (Sixth Edition)*, (365-451), Academic Press. Cambridge, Massachusetts, https://doi.org/10.1016/B978-0-12-824346-6.00018-1
15. Swain, A., Bruch, C., Ide, T., Lujala, P., Matthew, R. A., Weinthal, E., & Deligiannis, T. (2025). The U.S. withdrawal from the Paris Agreement—Implications for global climate governance and security. *Environment and Security*, *3*(1), 3-7, https://doi.org/10.1177/27538796251322680
16. Wei, C. C., & Lin, Y. G. (2016). Carbon future price return, oil future price return and stock index future price return in the US. *International Journal of Energy Economics and Policy*, *6*(4), 655-662.
17. Wen, F., Zhao, L., He, S., & Yang, G. (2020). Asymmetric relationship between carbon emission trading market and stock market: Evidence from China. *Energy Economics*, *91*, 104850.
18. Yuan, X., Dong, Y., Liang, L., & Wei, Y. (2025). The impact of carbon emission trading scheme policy on information asymmetry in the stock market: Evidence from China. *Energy Policy*, *198*, https://doi.org/10.1016/j.enpol.2025.114502
19. Zhang, Y., & Han, H. (2025). Legal routes for accomplishing corporate environmental compliance against the" carbon peaking and carbon neutrality" goals. *arXiv preprint arXiv:2502.13543*, Retrieved from: https://arxiv.org/pdf/2502.13543

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**Вплив ціни на вуглецеві ф'ючерси Єврозони на результативність цін фондового ринку**

***Анотація.*** Сучасна центральна роль вуглецевої відповідності в бізнес-операціях на фінансових ринках набуває імпульсу з розширенням вуглецевої відповідності.

В статті досліджується вплив ціни на ринку вуглецевих ф'ючерсів Єврозони (Ф'ючерси на викиди вуглецю [CFI2M5]) на результативність цін фондового ринку ЄС (Euro Stoxx 50 - STOXX50E).

**Постановка проблеми.** Дослідження взаємодії між ринком ф'ючерсів на викиди вуглецю та фінансовим ринком зростає, при цьому результати дослідників з різних економічних регіонів різняться.

**Нерозв'язані аспекти**. Існуюча прогалина в дослідженні полягає в нестачі цілеспрямованих досліджень щодо цін на вуглецеві ф'ючерси та цін фондового ринку в межах Єврозони, яка є світовим лідером у сфері вуглецевого ринку.

**Мета статті.** Метою цієї статті є оцінка того, чи впливає ціна ринку вуглецевих ф'ючерсів на ціну традиційного фондового ринку, а також визначення величини та напрямку цього впливу.

**Виклад основного матеріалу.** Дані для аналізу були зібрані протягом 124 днів з січня по червень 2025 року для вуглецевих ф'ючерсів ЄС (CFI2M5) та фондового ринку ЄС (STOXX50E). Дані аналізувалися за допомогою моделі простої регресії.

**Висновки.** Результати показують P-значення 0.006, що є нижчим за тестовий альфа-рівень 0.05, з коефіцієнтами регресії 9.977, що вказує на значущий і позитивний зв'язок. Це свідчить про те, що зростання ціни на ф'ючерси на викиди вуглецю в ЄС на 1% може призвести до зростання ціни Euro Stoxx 50 на 9.977. Стаття має важливі наслідки для корпоративних управлінців, аналітиків вуглецевих ф'ючерсів і фондового ринку та учасників ринку. Вона також визначає напрямок для подальших досліджень щодо міжконтинентальних відмінностей між ринком вуглецевих ф'ючерсів і фондовим ринком.

***Ключові слова:*** *фондова біржа, вуглецевий ринок, ціна акцій, Єврозона, торгівля викидами, ціна вуглецю, ціна акцій, вуглецевий облік, вуглецеві фінанси.*

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**Список літератури**

1. Antoniuk, Y., Leirvik, T. Climate change events and stock market returns. *Journal of Sustainable Finance & Investment*. 2024. 14(1). P. 42–67.
2. Callahan, C. W., Mankin, J. S. Carbon majors and the scientific case for climate liability. *Nature*. 2025. 640(8060). P. 893–901.
3. Colmer, J., Martin, R., Muûls, M., Wagner, U. J. Does pricing carbon mitigate climate change? Firm-level evidence from the European Union emissions trading system. *Review of Economic Studies*. 2025. 92(3). P. 1625–1660.
4. Enders, A., Lontzek, T., Schmedders, K., Thalhammer, M. Carbon risk and equity prices. *Financial Review*. 2025. 60(1). P. 13–32.
5. Fusion Media. Investing.com, Carbon Emissions Futures - Jun 2025 (CFI2M5). 2025. URL: https://za.investing.com/commodities/carbon-emissions-historical-data
6. Fusion Media. Investing.com, Euro Stoxx 50 (STOXX50E). 2025b. URL: https://za.investing.com/indices/eu-stoxx50-historical-data
7. Gabr, D. H., ElBannan, M. A. Is it worth it to go green? ESG disclosure, carbon emissions and firm financial performance in emerging markets. *Review of Accounting and Finance*. 2025. 24(2). P. 193–217.
8. Griffin, P. W., Hammond, G. P., Norman, J. B. Industrial energy use and carbon emissions reduction: a UK perspective. *Wiley Interdisciplinary Reviews: Energy and Environment*. 2016. 5(6). P. 684–714.
9. Günther, C., Pahle, M., Govorukha, K., Osorio, S., Fotiou, T. Carbon prices on the rise? Shedding light on the emerging second EU Emissions Trading System (EU ETS 2). *Climate Policy*. 2025. P. 1–12. DOI: https://doi.org/10.1080/14693062.2025.2485196
10. Kumar, N., Kayal, P., Maiti, M. A study on the carbon emission futures price prediction. *Journal of Cleaner Production*. 2024. 483. DOI: https://doi.org/10.1016/j.jclepro.2024.144309
11. Ma, Y., Wang, L., Zhang, T. Research on the dynamic linkage among the carbon emission trading, energy and capital markets. *Journal of Cleaner Production*. 2020. 272. 122717. DOI: https://doi.org/10.1016/j.jclepro.2020.122717
12. Qiu, L., Chu, L., Zhou, R., Xu, H., Yuan, S. How do carbon, stock, and renewable energy markets interact: Evidence from Europe. *Journal of Cleaner Production*. 2023. 407. 137106. DOI: https://doi.org/10.1016/j.jclepro.2023.137106

13. Rabe, M., Streimikiene, D., Bilan, Y. EU carbon emissions market development and its impact on penetration of renewables in the power sector. *Energies*. 2019. 12(15). 2961.
14. Ross, S. M. Regression. In: Ross, S. M. (ed.). *Introduction to Probability and Statistics for Engineers and Scientists*. Sixth Edition. Cambridge, Massachusetts: Academic Press, 2021. P. 365–451. DOI: https://doi.org/10.1016/B978-0-12-824346-6.00018-1
15. Swain, A., Bruch, C., Ide, T., Lujala, P., Matthew, R. A., Weinthal, E., Deligiannis, T. The U.S. withdrawal from the Paris Agreement—Implications for global climate governance and security. *Environment and Security*. 2025. 3(1). P. 3–7. DOI: https://doi.org/10.1177/27538796251322680
16. Wei, C. C., Lin, Y. G. Carbon future price return, oil future price return and stock index future price return in the US. *International Journal of Energy Economics and Policy*. 2016. 6(4). P. 655–662.
17. Wen, F., Zhao, L., He, S., Yang, G. Asymmetric relationship between carbon emission trading market and stock market: Evidence from China. *Energy Economics*. 2020. 91. 104850.
18. Yuan, X., Dong, Y., Liang, L., Wei, Y. The impact of carbon emission trading scheme policy on information asymmetry in the stock market: Evidence from China. *Energy Policy*. 2025. 198. DOI: https://doi.org/10.1016/j.enpol.2025.114502
19. Zhang, Y., Han, H. Legal routes for accomplishing corporate environmental compliance against the "carbon peaking and carbon neutrality" goals. *arXiv preprint*. 2025. arXiv:2502.13543. URL: https://arxiv.org/pdf/2502.13543

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# Financial crises in historical retrospective: causes, typology, and international implications

***Abstract.*** Financial crises are among the most serious and complex challenges facing the modern global economy, capable of causing deep, prolonged, and widespread negative consequences for both individual national economies and international financial markets as a whole. They undermine investor confidence, lead to sharp declines in asset values, bankruptcies of financial institutions and companies, rising unemployment, as well as slowing economic growth.

**Problem statement.** In the context of increasing globalization and the growing interdependence of financial systems across countries, the risks of crisis contagion become particularly significant, emphasizing the need for a thorough understanding of the nature of these processes.

**Unresolved aspects of the problem.** The absence of a unified theoretical framework for financial crises complicates their timely identification, classification, and the development of effective response strategies, which contributes to their escalation and deepening. Furthermore, the impact of the combination of globalization processes, behavioral factors, and geopolitical risks on the dynamics of crises, as well as typical crisis development patterns across different historical periods, remains insufficiently studied.

**The purpose of this article** is a comprehensive investigation of the essence of financial crises, their classification, and main causes, as well as an analysis of the most significant crises of the 20$^{th}$ and 21$^{st}$ centuries within the context of the evolution of the global economy.

**Presentation of the main material.** The article examines scientific approaches to defining crises, taking into account their multifaceted nature and diverse manifestations. A classification of crises is proposed based on form, source of origin, mode of propagation, stages of development, and institutional nature. Key factors are highlighted: macroeconomic imbalances, speculation, excessive credit expansion, regulatory gaps, structural changes, international fluctuations, geopolitical conflicts, political instability, and behavioral factors.

The course and consequences of the largest financial crises of the 20th and 21st centuries are analyzed, along with measures for overcoming them. Methods for preventing and mitigating consequences are considered, including the combination of regulatory, monetary, and fiscal tools. Historical experience allows for identifying regularities in crisis occurrence and improving the effectiveness of modern economic strategies.

**Conclusions**. A comprehensive approach to studying these phenomena is crucial for forecasting, preventing, and reducing the negative impact of crises in the globalized economy.

***Keywords:*** *financial crisis, macroeconomic imbalances, international fluctuations, globalization, economic consequences.*

**Formulas: –; figures: 1; tables: 2; references: 18**

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**Introduction.** In the current global economic environment, ensuring sustainable development is one of the most important and, at the same time, most complex tasks for national governments and international financial organizations. This task is further complicated by the growing instability of international economic relations, the impact of geopolitical conflicts, structural imbalances, and cyclical fluctuations in the global economy. One of the most destructive factors threatening economic stability and sustainable development is financial crises. Financial crises are capable of causing deep and prolonged negative consequences for national economies, international markets, and global financial stability. Therefore, the study of financial crises in historical retrospect – their causes, typology, and international implications – is of paramount relevance for understanding the nature of these phenomena and for developing effective strategies to prevent and mitigate their impact.

**Literature review.** In recent decades, there has been a significant increase in the number of studies devoted to the examination of financial crises, their typology, causes, and macroeconomic consequences. Particular attention is given both to the historical analysis of crisis phenomena and to modern methods of assessing and forecasting financial instability at the global level.

Among international scholarly works, a fundamental study is that of Laeven, L. and Valencia, F. [1], which provides a detailed examination of systemic banking crises over the past four decades. It presents a methodological approach to assessing their depth and duration. Also noteworthy is the study by Mates-Barco, J. and Vázquez-Fariñas, M. [2], which is historical and analytical in nature and covers the era of global economic crises from 1929 to 2022. The authors summarize the key causes and consequences of each crisis, placing particular emphasis on such crises as the Great Depression, the Global Financial Crisis of 2008, and the crisis associated with the COVID-19 pandemic.

An innovative approach to the analysis of financial crises is proposed by James, N. and Menzies, M. [3], who examine the mathematical structure of crisis phenomena, as well as the role of behavioral factors in the development of financial instability in the 21st century, particularly the influence of cognitive biases and investor irrationality.

Among Ukrainian scholarly works, the study by Baranovskyi, O. I. [4] should be particularly noted, as it reveals the essence of financial crises and their classification according to various criteria, including their sources, scale, and duration. The author emphasizes the importance of distinguishing between cyclical, structural, and systemic crises for the proper formation of anti-crisis policy.

The work of Ivanchenko, K. and Bilovodska, O. [5] considers modern approaches to the typology of financial crises. The authors propose their own classification of global financial crises and compare the main approaches found in the scientific literature.

A comprehensive interdisciplinary analysis of the macroeconomic consequences of financial crises using the example of Ukraine is presented in the study by Panchenko, V., Yatsenko, O., Musiiets, T., Zinchenko, F., and Oleksandrova, M. [6], in which the impact of global financial shocks on key national-level economic indicators is examined using the case study method.

**Purpose, objectives and research methods.** The purpose of this study is to conduct a comprehensive examination of the nature of financial crises, the classification of their types, and the identification of the main causes of their occurrence, as well as to analyze the most significant financial crises of the $20^{th}$ – $21^{st}$ centuries in the context of the historical development of the global economy.

The methodological basis of the research is a combination of general scientific and specialized methods of inquiry. In particular, the methods of analysis and synthesis, induction and deduction are applied to study the theoretical foundations and to generalize scientific approaches to understanding the nature of financial crises; the method of abstraction is employed to identify typical features and causes of crisis processes; the historical-logical method is used to investigate the development of financial crises over time and to compare their characteristics across different periods; the method of systematization is applied to classify types of crises according to their

sources; and the method of logical generalization is utilized to formulate conclusions and recommendations for improving anti-crisis regulation.

**Research results.** The first signs of a financial crisis were recorded as early as the 17th century and are associated with the event known as the Tulip Mania in the Netherlands, which became the first known example of a speculative bubble and economic collapse [7]. In the 18th – 19th centuries, numerous financial crises occurred, affecting the leading economies of the time, including Great Britain, France, the Netherlands, and the United States of America. These crises were mostly linked to excessive speculation in financial markets, public debts, as well as the consequences of wars and political instability. However, these crisis phenomena did not have a significant impact on the economies of other countries, as interdependence between national markets was limited and international financial flows were minimal.

Since then, financial crises have evolved considerably, encompassing increasingly broader economic spheres and causing deeper and more large-scale consequences for the global economy. In today's conditions of globalization, their impact is no longer limited to individual countries but takes on a systemic nature, affecting international financial markets, trade, and investment. This, in turn, determines the need for in-depth research into the theoretical foundations of the phenomenon of financial crises, their classification, causes, and mechanisms of transmission, as well as the development of effective tools for timely response, minimization of negative consequences, and prevention of their recurrence.

Despite the active study of crisis financial phenomena by the academic community over recent decades, there is still no consensus regarding the theoretical aspects of financial crises – specifically, there is no unified approach to defining the concept of a "financial crisis". This is due to the complexity and multidimensionality of this category, the variability of its manifestations in different economic systems, and the heterogeneity of research approaches based on different theoretical and methodological foundations.

Thus, Slobodianiuk, N. O., and Semeniuk, K. H. define a crisis as a deterioration of the financial market's condition, the occurrence of a state's financial bankruptcy, a disruption of the equilibrium of the financial and credit system, a devaluation of the national currency, an increase in budgetary and tax risks and their negative impact on business activities, the state's inability to finance and execute the budget, as well as quantitative and qualitative changes in the economic system, among other factors [8].

A similar approach to interpreting the concept of a "financial crisis" can be observed in the scholarly research of Vozniak, H., and Koval, V., who define a financial crisis as a disruption of equilibrium in the system of financial relations (or a sharp deterioration in the condition of the financial system) under the influence of external and internal factors (triggers), manifested in the instability of the banking sector, a decline in price indicators, the bankruptcy of financial market participants, a drop in GDP, an increase in the state budget deficit, a fall in the value of the national currency, hyperinflation, and so forth [9].

A completely different approach is found in the research of Korol, M. M., who notes that a financial crisis is a kind of indicator of the weakness of the financial system, characterized by its global nature and unpredictability, as well as by extremely complex political, economic, financial, social, and psychological phenomena that occur in different periods of time [10].

Panchenko, V., Yatsenko, O., Musiiets, T., Zinchenko, F., and Oleksandrova, M. describe a "financial crisis" as a situation involving the sudden loss of a significant portion of the market value of financial assets, which leads to an imbalance in the economic system. Such a crisis triggers substantial changes that can halt development, alter the form, or even destroy the financial systems of individual countries or global markets [6].

In the definition provided by Demchenko, D. A., Nosova, T. I., Zhadko, K. S., and Kalmykov, O. V., emphasis is placed on the severe deterioration of the domestic economic situation, which is expressed and manifested in a significant decline in production, enterprise bankruptcies, the breakdown of existing labor relations, an increase in unemployment, and, consequently, a decrease in the standard of living and the well-being of the population [11].

Thus, analyzing the approaches of contemporary domestic scholars regarding the essence of the concept of a "financial crisis," it can be concluded that this phenomenon is highly multifaceted and complex. Most definitions emphasize the systemic nature of a crisis, its ability to affect various segments of the financial market, as well as its connection with internal imbalances and external shocks. Therefore, a financial crisis is a state of the financial system characterized by the disruption of the functioning of financial institutions, loss of investor confidence, a sharp decline in asset prices, deterioration of liquidity, and the threat of systemic instability.

One of the most important aspects of studying financial crises is the examination of their classification, as a clear definition of crisis types is a necessary prerequisite for a deeper understanding of their economic nature, causes, mechanisms of transmission, and for the timely development of effective measures to prevent and minimize negative consequences.

Domestic and foreign scholars apply various approaches to the classification of financial crises, relying on a wide range of features and classification criteria that allow for the systematization of diverse manifestations of crisis phenomena, a deeper understanding of their economic nature, sources of origin, scope of impact, mechanisms of transmission, and development dynamics. Among the key criteria used in the process of typology are: form of manifestation; source of origin; nature of dissemination; stages of development; and institutional characteristics. A generalized approach to the classification of financial crises in the scientific literature is presented in Figure 1.

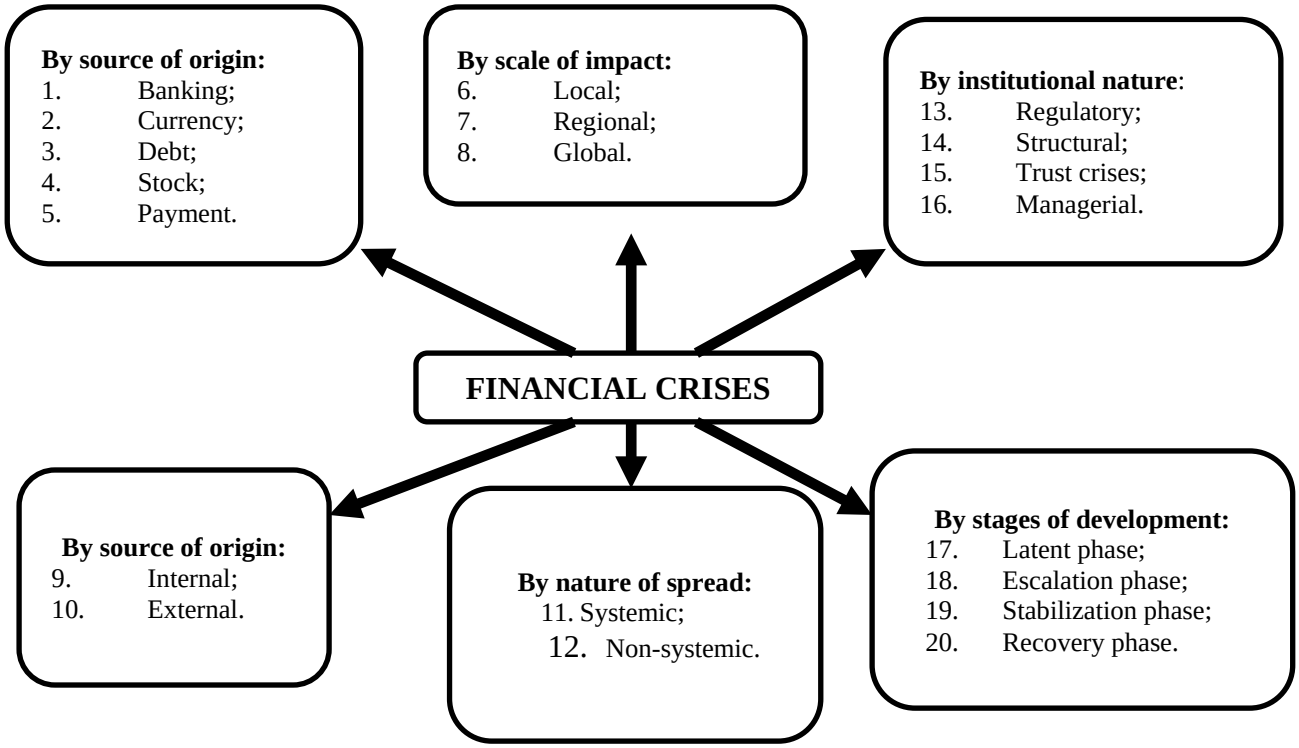


*Figure 1. Classification of Financial Crises*
*Source: prepared by the authors on the basis of [1, 4-6]*

The application of such a multidimensional classification allows not only for the systematization of existing experience in overcoming crises but also for the development of effective mechanisms for their prediction and mitigation of consequences in the future.

The classification of crisis types is closely related to their causes, as the sources of origin determine the nature and form of crisis phenomena. Understanding the causes is key to correctly identifying the type of crisis, its development, and selecting effective mechanisms for overcoming it. Accordingly, based on the above classification of financial crises, the main causes of their occurrence can be distinguished, in particular:

- macroeconomic imbalances (excessive accumulation of public debt, balance of payments deficits, and inflationary pressure);
- speculation in financial markets (unjustified price increases in real estate, stocks, financial instruments, and other assets);
- excessive credit expansion (high leverage, insufficient control over the quality of the credit portfolio, opaque pricing of financial products);
- imperfect state regulation and financial market supervision (gaps in legislation and lack of regulatory norms);
- structural shifts in the economy (industrialization, privatization);
- international economic fluctuations and downturns (changes in global prices, drops in demand);
- geopolitical confrontations (currency and trade wars);
- political and social instability (sudden changes in national policy, civil unrest and military actions, demographic challenges);
- behavioral factors (excessive trust or panic among financial market participants).

Moreover, it should be noted that financial crises usually arise and develop under the simultaneous influence of multiple factors; that is, they are a multifactorial phenomenon emerging from a combination of macroeconomic imbalances, structural changes, regulatory gaps, external shocks, and behavioral factors, among others.

Based on the study of the essence of financial crises, their causes, and classification approaches, it can be concluded that financial crises are complex, multifaceted processes that result from the interaction of economic, political, and social factors. To gain a deeper understanding of their nature and impact on national and global economies, it is advisable to analyze the most prominent financial crises of the 20th–21st centuries (Table 1).

*Table 1. The major financial crises of the 20th and 21st centuries.*

| № | Years | Countries | Crisis |
|---|---|---|---|
| 1. | 1909–1907 | United Kingdom | Liquidity crisis (related to a sharp increase in the discount rate) |
| 2. | 1929–1933 | USA and the World | Great Depression |
| 3. | 1939–1945 | USA, Europe, Asia | Crisis years during and after World War II |
| 4. | 1973–1975 | United Kingdom | Secondary banking crisis |
| 5. | 1980–1982 | Latin America | Debt crisis |
| 6. | 1987 | USA | “Black Monday” (stock market crash) |
| 7. | 1989–1991 | Japan | Asset bubble collapse |
| 8. | 1992 | United Kingdom | “Black Wednesday,” currency crisis |
| 9. | 1994 | Mexico | Peso crisis (“Tequila crisis”) |
| 10. | 1997–1998 | Indonesia, Korea, Malaysia | Asian financial crisis |
| 11. | 1999–2002 | Argentina | Sovereign debt crisis |
| 12. | 2000–2002 | USA | Dot-com bubble crash |
| 13. | 2001 | Turkey | Banking and currency crisis |
| 14. | 2001 | Argentina | Currency default and banking crisis |
| 15. | 2007–2009 | USA and the World | Global financial crisis |
| 16. | 2010-2012 | Greece, Ireland, Portugal, Spain, Italy | Eurozone debt crisis |
| 17. | 2014 | Brazil | Recession and debt crisis |
| 18. | 2015–2016 | China | Stock market crash |
| 19. | 2018 | Argentina | Currency and debt crisis |
| 20. | 2018 | Turkey | Currency crisis |
| 21. | 2020 | World | Economic crisis caused by the COVID-19 pandemic |
| 22. | 2021-2023 | USA and Europe | Inflation and energy crisis (intensified after Russia’s invasion of Ukraine in 2022) |

*Source: prepared by the authors on the basis of [1-3]*

The table presents the main, most large-scale, and influential financial crises of the 20th and 21st centuries, which arose from various causes and had a significant impact on the global economy and the financial systems of different countries. At the same time, it should be noted that this list is by no means exhaustive, as history over the studied period experienced many more instances of financial shocks, local and regional crises, which also influenced the development of economic processes in individual countries.

According to the updated database of the International Monetary Fund, only during the period from 1970 to 2017, there were 151 recorded systemic banking crises, 236 currency crises, and 79 sovereign debt crises [1].

Thus, contemporary science is aware of a significant number of financial crises affecting different regions and time periods. However, within the scope of this study, a more detailed analysis will be conducted of the three most influential and defining crises of the 20th – 21st centuries: the Great Depression of the 1930s, the Global Financial Crisis of 2007 – 2009, and the Economic Crisis caused by the COVID-19 pandemic in 2020. The selection of these specific crises is justified by their scale, the depth of economic shocks, and the long-term consequences for the global economy.

The Great Depression was the first global financial shock that affected almost all countries worldwide and fundamentally changed approaches to market regulation and government policy.

The Great Depression, which began in 1929 in the USA, was caused by a combination of several factors [12]:

- high income inequality led to a decrease in aggregate demand. Wealthy segments of the population spent only a small portion of their income, while poorer segments did not have sufficient funds for consumption.
- rapid growth of the stock market in the 1920s was based on speculative operations and was not supported by real economic growth. Panic on the stock exchange and mass selling of shares led to a market collapse and a loss of investor confidence.
- the American banking system was insufficiently regulated. Widespread bank failures resulted in a contraction of the money supply and intensified the economic downturn.
- protectionist policies, aimed at shielding domestic producers from foreign competition, restricted international trade and reduced the efficiency of the global economy.
- overproduction of agricultural goods and the fall in agricultural prices led to the bankruptcy of many farmers and a reduction in agricultural production.

The stock market crash on October 24, 1929 (“Black Thursday”) caused a sharp decline in stock prices by 60 – 70%, triggering the onset of the crisis, a decrease in business activity, and asset devaluation. As a result, factories and banks closed, and unemployment increased. The total number of bankrupt banks exceeded 5,000. Unemployment in the USA reached over 25%, and industrial production was reduced by almost half. The crisis quickly spread to other countries, a consequence of global economic interdependence [13].

Efforts to combat the effects of the Great Depression lasted nearly ten years and were accompanied by active government intervention in the economy. In this context, particular significance was attached to President Franklin Roosevelt’s “New Deal” program, which included large-scale government investments in infrastructure, banking system reform, the introduction of social guarantees, and support for employment. At the international level, this contributed to strengthening the role of the state in the economy, expanding regulatory functions, and the development of new economic approaches and institutions to prevent similar crises in the future.

The Global Financial Crisis of 2007 – 2009 is the most recent example of systemic risk generated by innovations in the financial sector and the high integration of global markets.

The Global Financial Crisis of 2007 – 2009 began with a surge in defaults in the U.S. mortgage market. In 2007, the scale of mortgage delinquencies started to increase, leading to a decline in the value of securities backed by these loans. Additionally, the causes of the financial crisis included [14]:

- inflated real estate bubble (artificially high housing prices led to widespread defaults and the collapse of the mortgage market);
- simplified mortgage lending conditions (resulted in a significant increase in the number of borrowers with low creditworthiness);
- rapid increase in real estate prices created the illusion of profitable investments;
- subprime adjustable-rate mortgages (loans provided to borrowers with low credit ratings at initially low interest rates, which later increased significantly);
- extensive use of the CDO (Collateralized Debt Obligation) financial instrument, which pooled risky subprime loans, including adjustable-rate mortgages, masking the true level of risk for investors;
- weak government oversight of the financial market.

The first institutions affected were mortgage lenders and hedge funds, but by 2008, the crisis had also impacted large investment banks that held significant amounts of toxic assets on their balance sheets.

On September 15, 2008, an event occurred that ultimately transformed the financial crisis into a global economic catastrophe – the bankruptcy of the investment bank Lehman Brothers. This day went down in history as “Black Monday.” The collapse of Lehman Brothers had a cascading effect on the global financial system. It raised doubts about the ability of insurance companies to fulfill credit default swap (CDS) obligations, leading to a crisis of confidence between banks and a sharp increase in lending rates. The Dow Jones index fell by a record amount – the largest decline since the September 11, 2001 attacks. Investors began massively withdrawing funds from their accounts, preferring U.S. Treasury securities as the safest asset. On September 17, 2008, investors withdrew a record $196 billion from their accounts. The crisis quickly spread beyond the United States. On October 6, 2008, stock markets worldwide suffered significant losses [15].

In response to the crisis, governments and central banks around the world implemented large-scale economic stimulus programs, which included record monetary injections, support for financial institutions, reform of financial regulation, and strengthened supervision of the banking system. This also contributed to increased coordination between countries and the introduction of new banking supervision standards (Basel III).

The economic crisis caused by the COVID-19 pandemic became the largest global recession since World War II, resulting in a sharp decline in GDP, rising unemployment, and unprecedented government intervention in the economy.

Unlike “traditional” economic crises, the economic crisis of 2020–2021 was caused by a natural phenomenon – the COVID-19 pandemic. In order to stop or at least slow the spread of the new virus and reduce the unprecedented burden on national healthcare systems, countries were forced to implement extremely strict and extensive quarantine measures, including lockdowns. These measures negatively affected economic activity and caused a global economic recession [16].

Starting in February 2020, global financial markets experienced a sharp decline due to the spread of the SARS-CoV-2 virus, which led to widespread quarantines, production stoppages, and disruptions in global supply chains.

In 2020 alone, the global economy experienced a significant contraction: global GDP decreased by 5.2%, marking the worst performance since World War II. This resulted in massive job losses, reduced household incomes, and rising unemployment in many countries. Sectors dependent on the physical presence of consumers—such as tourism, aviation, hospitality, and entertainment—were particularly affected. In response to the crisis, governments implemented unprecedented support measures, including large-scale fiscal stimulus, monetary easing, and social programs to preserve employment [17].

To mitigate the consequences of the crisis, governments of many countries launched extensive economic stimulus programs, including fiscal and monetary measures aimed at supporting businesses and the population.

Thus, the three largest contemporary financial crises have been examined. Based on the analysis of their causes, course, and consequences, it is appropriate to compare the main characteristics of these crises (Table 2).

*Table 2. Comparative Characteristics of Contemporary Financial Crises*

| Criterion | The Great Depression (1929–1939) | Global Financial Crisis (2007–2009) | COVID-19 Crisis (2020–2021) |
|---|---|---|---|
| Origin | Stock market decline, bank failures, protectionism, overproduction | Collapse of the mortgage market, financial innovations, weak regulation | Natural phenomenon – pandemic, quarantines, production stoppages |
| Key Causes | Social inequality, stock market speculation, weak banking regulation, protectionism, overproduction in agriculture and industry | Housing bubble, subprime loans, CDOs and CDS, lack of risk control | SARS-CoV-2 pandemic, quarantines and lockdowns, disruption of global supply chains |
| Key Events | Black Thursday" – October 24, 1929: market collapse of 60–70% | Lehman Brothers bankruptcy – September 15, 2008 | Massive market declines from February 2020, global lockdowns |
| Consequences | Large number of bank failures, 25% unemployment in the USA, production halved | Losses over $10 trillion, stock market collapse, crisis of confidence in the banking sector | Global GDP fell by 5.2% (in 2020 alone), massive unemployment, halt of tourism, aviation, etc. |
| Global Impact | Crisis spread through economic interdependence | Rapid spread through integrated financial markets | Simultaneous global downturn due to the pandemic |
| Government Response | Roosevelt's "New Deal," government investments, banking sector reforms | Monetary stimulus, regulatory reforms (Basel III), bank refinancing | Fiscal stimulus, increased social payments, employment support programs |
| Institutional Consequences | Strengthening of the state's role in the economy | Establishment of new regulatory standards | Rethinking the role of the state and public health in the economy |

*Source: prepared by the authors on the basis of [12-17]*

Thus, based on the analysis of the information presented in Table 2, it can be concluded that the studied financial crises share both common features and distinctive characteristics that significantly differentiate them from one another. Among the common features, it is worth noting a sharp decline in economic activity, destabilization of financial markets, rising unemployment, and the need for active government intervention. These traits are typical of most crises, as they indicate the systemic nature of financial disruptions and the vulnerability of national economies to internal and external shocks.

A closer look at the distinctive features of these economic collapses reveals that the Great Depression arose due to internal economic imbalances, such as stock market speculation, overproduction, protectionism, and weak banking regulation. In contrast, the Global Financial Crisis of 2007–2009 was caused by specific problems in the financial sector – the housing bubble, subprime loans, financial innovations, and insufficient risk oversight. The COVID-19 crisis of 2020–2021, in turn, had an exogenous character: its direct cause was the COVID-19 pandemic, which triggered mass quarantines, production halts, disruptions in global supply chains, and a decline in demand.

Significant differences were also observed regarding the scale and speed of the transmission of consequences. While in the 1930s the spread of crisis phenomena occurred primarily through trade connections, in 2008 it spread through globally integrated financial markets. The pandemic, in turn, caused a synchronous downturn in most countries worldwide, an unprecedented phenomenon for the modern economy.

It is also worth noting the differences in measures taken to overcome financial crises and their consequences. In the 1930s, the United States implemented the government reform program known as the "New Deal" to combat the crisis. During the 2007–2009 crisis, priority was given to monetary stimuli, bank recapitalization, and strengthened regulation. In 2020–2021, fiscal stimuli became the primary support tool, alongside extensive social assistance programs and measures to support healthcare systems.

Moreover, each crisis left institutional consequences: from strengthening the role of the state in the economy to revising approaches to financial market regulation and rethinking the significance of healthcare systems. All these examples confirm that financial crises, despite sharing common features, possess unique characteristics determined by the specific historical context and the structure of the global economy at the time of their occurrence.

Thus, the conducted study allowed for the identification of key causes and mechanisms of the most significant financial crises of the 20th century. Based on this analysis, it is possible to search for effective tools to prevent new crises and mitigate their negative consequences. Today, various methods for preventing and managing the effects of financial crises are employed, continuously evolving in accordance with changes in the global economy.

However, the most commonly applied approaches can be conditionally divided into preventive methods and methods for mitigating the consequences.

Preventive methods include:

– ensuring macroeconomic stability (controlling inflation, maintaining a balanced budget, regulating the level of public debt);

– effective banking regulation (implementing capital adequacy requirements, monitoring credit risk, limiting excessive lending);

– independence of the central bank (prudent monetary policy, absence of political interference in the banking sector);

– implementation of risk monitoring and early warning systems (establishing specialized analytical centers, regular assessment of systemic risks, stress testing of financial institutions);

– improving financial literacy among the population (educational campaigns, integrating financial literacy into school curricula).

Methods for mitigating the consequences of crises include:

– fiscal stimulus (government investment programs, tax incentives for businesses, subsidies for key sectors of the economy);

– reducing the policy interest rate (lowering the cost of money in the economy to stimulate lending to businesses and households);

– liquidity support (refinancing commercial banks by the national bank, encouraging foreign investment);

– debt restructuring (postponement of loan payments, liberalization of lending terms, partial debt write-offs);

– social support programs for vulnerable groups (unemployment benefits, subsidies for housing and utility payments).

The comprehensive application of these tools helps prevent financial crises or significantly reduce their negative consequences.

**Discussion.** Thus, financial crises are an integral part of the modern global economy due to the high interdependence of countries, the complexity of national financial systems, the cyclical nature of economic development, and vulnerability to external shocks. Over the past century, the global economy has repeatedly experienced large-scale disruptions that have had a significant impact both on individual countries and on the world financial system as a whole. The study of crises such as the Great Depression, the Global Financial Crisis of 2007–2009, and the crisis caused by the COVID-19 pandemic confirms that each crisis has its unique causes, typology, and scale of impact, which require a comprehensive approach to analysis and management.

At the same time, it should be noted that contemporary financial crisis management faces a number of challenges due to the complexity of global economic connections, the diversity of crisis factors, and the speed at which crises spread. Therefore, it is considered appropriate to conduct further research aimed at identifying promising and effective methods for preventing financial crises and minimizing their consequences, including improving financial market regulation systems, enhancing risk monitoring, implementing crisis response mechanisms, and increasing the resilience of national economies to global shocks.

**Conclusions.** Financial crises represent a multifaceted and complex phenomenon characterized by a systemic nature and encompassing various segments of the financial market. They arise as a result of the interaction of numerous economic, political, and social factors, highlighting their complexity and ambiguity. The analysis of the largest financial crises of the 20th and 21st centuries demonstrate that, despite the diversity of causes and forms of manifestation, all these events cause significant disruptions in the global economy, leaving long-lasting negative consequences for the financial systems of different countries.

Research also confirms that effective government regulation and timely intervention are critically important elements for mitigating crisis phenomena, ensuring economic stabilization, and preventing substantial losses. At the same time, crises reveal a high level of interdependence among global markets, which facilitates the rapid spread of financial shocks internationally, amplifying systemic risks and intensifying challenges for financial regulators.

The speed and scale of financial crises necessitate the continuous updating and improvement of methods for their prevention and mitigation. This requires not only local but also global efforts in policy coordination, the implementation of innovative early-warning mechanisms, the development of crisis management strategies, and the enhancement of national economies' resilience to external shocks.

Thus, further research and practical implementation of effective approaches to financial crisis management is a key task for ensuring the stability of the global economic system and promoting sustainable development.

**References**

1. Laeven, L., & Valencia, F. (2018). Systemic banking crises revisited (IMF Working Paper No. 2018/206). *International Monetary Fund*. Retrieved from https://www.imf.org/en/Publications/WP/Issues/2018/09/14/Systemic-Banking-Crises-Revisited-46232
2. Matés-Barco, J. M., & Vázquez-Fariñas, M. (2023). The age of global economic crises (1929–2022*). London: Routledge*. 2023, 220p.
3. James, N., & Menzies, M. (2023). An exploration of the mathematical structure and behavioural biases of 21st century financial crises. *arXiv*. Retrieved from https://arxiv.org/abs/2307.15402
4. Baranovskyi, O. I. (2009). The essence and types of financial crises. *Finance of Ukraine*, (6), pp. 3–13. [in Ukrainian]
5. Ivanchenko, K., Bilovodska, O. (2024). Conceptual approaches to the definition and classification of crises in the activities of business entities. *Bulletin of Taras Shevchenko National University of Kyiv*, 224(1), pp. 4–12. https://doi.org/10.17721/1728-2667.2024/224-1/4 [in Ukrainian]
6. Panchenko, V., Yatsenko, O., Musiiets, T., Zinchenko, F., & Oleksandrova, M. (2024). Global financial crises and their macroeconomic consequences for national economies: the case of Ukraine. *Financial and Credit Activity*: *Problems of Theory and Practice*, 6(59), pp. 336–352. https://doi.org/10.55643/fcaptp.6.59.2024.4552 [in Ukrainian]
7. Was Tulip Mania Really "The Biggest Financial Bubble of All Time"? *BBC Ukrainian*. Retrieved from https://www.bbc.com/ukrainian/features-44131890 [in Ukrainian].
8. Slobodyanyuk, N. O., Semeniuk, K. H. (2024). Diagnostics and assessment of the impact of financial and economic crises on the development of the banking system of Ukraine. *Business Inform*, (6), 315–322. Retrieved from https://www.business-inform.net/export_pdf/business-inform-2024-6_0-pages-315_322.pdf [in Ukrainian]
9. Vozniak, H., Koval, V. (2022). Crisis as a form of manifestation of financial instability: essence and consequences for local economic development. *Economic Herald of Volyn National University named after Lesia Ukrainka*, (4), 71–78. Retrieved from https://scispace.com/pdf/kriza-iak-forma-proiavu-finansovoyi-nestabilnosti-sutnist-ta-2evfkjko.pdf [in Ukrainian]
10. Korol, M. M. (2021). Paradigm differentiation of banking systems under global transformations: abstract of the doctoral dissertation in economics (08.00.02). Taras Shevchenko National University of Kyiv. 36 p. [in Ukrainian]
11. Demchenko, D. A., Nosova, T. I., Zhadko, K. S., Kalmykov, O. V. (2023). The essence of economic crises and their impact on the formation and development of enterprises' personnel potential. *Central Ukrainian Scientific Bulletin. Economic Sciences*, 10(43), 62–70. https://doi.org/10.32515/2663-1636.2023.10(43).62-70 [in Ukrainian]

12. The Great Depression: Causes and Consequences for the Global Economy. *Fakty.com.ua*. Retrieved from https://fakty.com.ua/ua/ukraine/ekonomika/20240910-velyka-depresiya-prychyny-ta-naslidky-dlya-svitovoyi-ekonomiky/ [in Ukrainian]
13. Bezhubenko-Hnatyshyn, V. Y. (2015). Genesis, causes, and consequences of global economic crises. *World of Finance*, (3), 144–156. [in Ukrainian]
14. $10 Trillion Losses: What Caused the 2008 Financial Crisis and Its Global Consequences? *Ukr. radio*. Retrieved from https://ukr.radio/news.html?newsID=106782 [in Ukrainian].
15. "Black Monday": How the 2008 Global Financial Crisis Began. *Finteco.com.ua.* Retrieved from https://finteco.com.ua/publications/4339-chornyy-ponedilok-iak-pochalasia-svitova-finansova-kryza-2008-roku/ [in Ukrainian].
16. COVID-19 as a Natural-Origin Economic Crisis. *Espreso.tv*. Retrieved from https://espreso.tv/covid-19-yak-ekonomichna-kriza-prirodnogo-pokhodzhennya [in Ukrainian].
17. Crisis Again: The Global Economy Faces a New Downturn in Record Time. *BBC Ukrainian*. Retrieved from https://www.bbc.com/ukrainian/features-63611110? [in Ukrainian].

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**Фінансові кризи в історичній ретроспективі: причини, типологія та міжнародні наслідки**

***Анотація.*** Фінансові кризи є одними з найсерйозніших та найскладніших викликів сучасної світової економіки, які мають здатність спричиняти глибокі, тривалі та масштабні негативні наслідки як для окремих національних економік, так і для міжнародних фінансових ринків загалом. Вони підривають довіру інвесторів, призводять до стрімкого зниження вартості активів, банкрутств фінансових установ і компаній, зростання безробіття, а також уповільнення економічного зростання.

**Постановка проблеми.** В умовах посилення глобалізації та все більшої взаємозалежності фінансових систем різних країн ризики поширення кризових явищ набувають особливої ваги, що підкреслює необхідність глибокого розуміння природи цих процесів, що і обумовлює необхідність їх дослідження.

**Нерозв'язані аспекти.** Відсутність єдиної теоретичної концепції фінансових криз ускладнює їх своєчасну ідентифікацію, класифікацію та розробку дієвих стратегій реагування, що сприяє їх загостренню та поглибленню. Крім того, недостатньо дослідженими залишаються вплив поєднання глобалізаційних процесів, поведінкових чинників і геополітичних ризиків на динаміку кризових явищ, а також типові моделі розвитку криз у різні історичні періоди.

**Метою статті** є всебічне дослідження сутності фінансових криз, їх класифікації та основних причин виникнення, а також аналіз найбільш значущих криз XX–XXI століть у контексті еволюції глобальної економіки.

**Основний матеріал.** У статті досліджено наукові підходи до визначення криз із урахуванням їх багатогранності та різноманітності проявів. Запропоновано класифікацію криз за формою, джерелом виникнення, характером поширення, етапами розвитку та інституційною природою. Виокремлено ключові чинники: макроекономічні дисбаланси, спекуляції, надмірну кредитну експансію, регуляторні прогалини, структурні зміни, міжнародні коливання, геополітичні конфлікти, політичну нестабільність і поведінкові фактори.

Проаналізовано перебіг і наслідки найбільших фінансових криз XX–XXI століть, а також заходи для їх подолання. Розглянуто методи запобігання та мінімізації наслідків, зокрема поєднання регуляторних, монетарних і фіскальних інструментів. Історичний досвід дає змогу виявити закономірності виникнення криз і підвищити ефективність сучасних економічних стратегій.

**Висновки.** Комплексний підхід до вивчення цих явищ є ключовим для прогнозування, запобігання та зменшення негативного впливу криз у глобалізованій економіці.

***Ключові слова****: фінансова криза, макроекономічні дисбаланси, міжнародні коливання, глобалізація, економічні наслідки.*

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**Список літератури**

1. Laeven L., Valencia F. Systemic Banking Crises Revisited. IMF Working Paper. 2018. № 2018/206. 48 с. URL: https://www.imf.org/en/Publications/WP/Issues/2018/09/14/Systemic-Banking-Crises-Revisited-46232
2. Matés-Barco, J. M., Vázquez-Fariñas, M. The Age of Global Economic Crises (1929–2022). London, Routledge, 2023, 220p.
3. James N., Menzies M. An Exploration of the Mathematical Structure and Behavioural Biases of 21st Century Financial Crises. arXiv, 2023. URL: https://arxiv.org/abs/2307.15402
4. Барановський О. І. Сутність і різновиди фінансових криз. *Фінанси України*. 2009. № 6. С. 3–13.
5. Іванченко, К., Біловодська, О. Концептуальні підходи до визначення та класифікації криз у діяльності суб'єктів господарювання. *Вісник Київського національного університету імені Тараса Шевченка*, № 224(1). 2024. С. 4–12. https://doi.org/10.17721/1728-2667.2024/224-1/4
6. Панченко В. Яценко О. Мусієць Т. Зінченко Ф. Олександрова М. Світові фінансові кризи та їх макроекономічні наслідки для національних економік: кейс України. *Фінансово кредитна діяльність проблеми теорії та практики*. 2024. Т. 6. № 59. С. 336–352. DOI 10.55643/fcaptp.6.59.2024.4552
7. Чи справді тюльпаноманія була «найбільшою фінансовою бульбашкою усіх часів»? URL:https://www.bbc.com/ukrainian/features-44131890

8. Слободянюк Н. О., Семенюк К. Г. Діагностика та оцінка впливу фінансово-економічних криз на розвиток банківської системи України. *Бізнес інформ* №6. 2024. С. 315-322. URL: https://www.business-inform.net/export_pdf/business-inform-2024-6_0-pages-315_322.pdf
9. Возняк Г., Коваль В. Криза як форма прояву фінансової нестабільності: сутність та наслідки для місцевого економічного розвитку. *Економічний часопис Волинського національного університету імені Лесі Українки.* №4. 2022. С. 71-78. URL: https://scispace.com/pdf/kriza-iak-forma-proiavu-finansovoyi-nestabilnosti-sutnist-ta-2evfkjko.pdf
10. Король М.М. Парадигмальна диференціація банківських систем в умовах глобальних трансформацій: автореф. дис. ... д-ра екон. наук : 08.00.02. Київський національний університет імені Тараса Шевченка. Київ, 2021. 36 с.
11. Демченко Д. А., Носова Т. І., Жадько К. С., Калмиков О. В. Зміст економічних криз та їх вплив на формування та розвиток кадрового потенціалу підприємств. *Центральноукраїнський науковий вісник. Економічні науки*. 2023. № 10(43). С. 62–70. – DOI: https://doi.org/10.32515/2663-1636.2023.10(43).62-70
12. Велика депресія: причини та наслідки для світової економіки. URL: https://fakty.com.ua/ua/ukraine/ekonomika/20240910-velyka-depresiya-prychyny-ta-naslidky-dlya-svitovoyi-ekonomiky/
13. Безгубенко-Гнатишин В. Ю. Генезис, причини та наслідки світових економічних криз. *Світ фінансів*. 2015. № 3. С. 144–156.
14. Збитки в 10 трлн доларів: що спричинило фінансову кризу 2008 року та які наслідки вона мала для всього світу? URL: https://ukr.radio/news.html?newsID=106782
15. «Чорний понеділок»: як почалася Світова фінансова криза 2008 року. URL: https://finteco.com.ua/publications/4339-chornyy-ponedilok-iak-pochalasia-svitova-finansova-kryza-2008-roku/
16. COVID-19 як економічна криза природного походження. URL: https://espreso.tv/covid-19-yak-ekonomichna-kriza-prirodnogo-pokhodzhennya
17. Знову криза. Світовій економіці загрожує новий спад у рекордно короткі терміни. URL: https://www.bbc.com/ukrainian/features-63611110?

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# Управління фінансово-кредитними системами та соціально-гуманітарна компонента їх розвитку

# Management of financial and credit systems and the socio-humanitarian component of their development

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## Motivation of managers of business entities in times of crisis and war: challenges and transformations

***Abstract.*** The article examines the motivational aspects of professional development of managers of business entities in conditions of economic turbulence, crisis and war, when management personnel act as a key resource for maintaining the viability and competitiveness of a business. The object of the study is the motivation system of managers as the basis for their professional growth, adaptability and resilience in extreme circumstances.

**Problem statement.** The main problem is identified as the transformation of traditional approaches to motivation in crisis conditions, when material incentives largely lose their effectiveness due to limited resources, while intangible factors (value, social, patriotic) acquire leading importance.

**Unresolved aspects of the problem.** At the same time, the issues of quantitative assessment of the impact of motivational systems on the economic performance of enterprises, the formation of an index of motivational resilience of managers, as well as the study of the latest digital and psychological motivation tools remain unresolved.

**Purpose of the article.** The purpose of the article is to substantiate the role of motivation in the professional development of managers of business entities in crisis conditions and analyze its impact on the economic efficiency of enterprises. The study used the methods of system analysis, typology, expert assessment, comparative analysis of motivational models and inductive generalization.

**Presentation of the main material.** The main attention is paid to the identification of types, forms and directions of professional development of managers, the transformation of the structure of motivational factors and their integration into management practice. The results of the study indicate that motivation in crisis conditions acquires a complex character: value, social, work-life balance and existential motivation come to the fore. An effective motivation system should be adaptive, individualized and focused on a combination of material and non-material incentives. This has theoretical and practical significance in the context of the prospect of creating an effective system of motivation for managers. A direct economic effect of managers' motivation has been established, which is manifested in increased productivity, reduced costs, strengthened corporate cohesion and increased innovative capacity of enterprises.

**Conclusions.** It is concluded that an integrated system of motivation for managers in crisis conditions is not only a factor in business sustainability, but also a guarantee of the country's economic recovery.

***Keywords:*** *motivation, professional development, economic resources, human resources management, war, crisis, business entity, economy.*

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**Introduction.** In the extraordinary conditions of martial law and economic turbulence, the business sector is experiencing serious stress and threats. One of the most important economic resources for maintaining the viability and adaptability of a business entity are managers – administrators who are able to make effective decisions in conditions of uncertainty. However, to ensure their stability, initiative and readiness for professional growth, a powerful motivational system is necessary. Motivation in such conditions not only preserves the managerial potential of a business entity, but also becomes the driver of its innovative development, reformatting business models and survival in the market.

Modern socio-economic challenges caused by the full-scale war in Ukraine require a radical revision of approaches to personnel management, in particular in the field of professional development of managers. The increased level of uncertainty, the destruction of familiar business models, risks to employee safety – all this forms new motivational conditions that are significantly different from peacetime. Therefore, the scientific study of motivational aspects is being updated as one of the key mechanisms for ensuring the managerial capacity of business entities.

The importance of studying the motivational aspects of the professional development of managers of business entities is due to the fact that modern markets are characterized by dynamism, high competition and innovative challenges. Managers as leaders of change must constantly improve their skills for effective decision-making. The development of professional competencies ensures adaptability, flexibility and the ability to innovate, which is critically important for the sustainable development of business entities. Enterprises with a high level of investment in personnel development have higher profitability and productivity indicators.

Professional development of managers of business entities is a key factor in ensuring the effectiveness of management, innovative capacity and competitiveness of the enterprise. It can be classified by types, forms and areas, each of which has its own specifics and significance for achieving the strategic goals of the business entity.

**Literature review.** Classical approaches to professional development and staff motivation cover material, social and organizational factors. In the context of professional development, attention is focused on creating conditions for continuous learning, career growth and self-realization of the individual. Peter Drucker in a classic article [4] analyzes the concept of self-management as a key component of professional development. He emphasizes the importance of self-awareness, understanding of one's own strengths, values and learning style as the basis of an effective manager. Work is a universal guide for managers in any cultural and economic context. Svitovy O. M. [20] analyzes the concept of self-management as a key component of professional development and career growth of a manager. He explores modern technologies of effective time management, concepts of self-organization, self-control and their impact on professional growth. In the work of Cherusheva G. and Parkhomenko V. [3] provides an analysis of models of innovative competencies of managers. The authors focus on the structural and functional components of these models, in particular with regard to emotional intelligence. This understanding of management already goes beyond traditional technical approaches, giving priority to ethical, psychological aspects and the development of internal resources of managers.

Mintzberg H. [16] criticizes traditional business education and offers alternative models of manager development based on experience, ethical approaches and continuous professional self-improvement. He emphasizes the importance of contextual learning and team interaction as the basis of effective management. Continuing the author's opinion, Gorodianska L. [8] emphasize the importance of developing a person's emotional intelligence as a basis for forming leadership qualities and establishing effective team interaction in modern conditions. Modern research

indicates the growing role of non-material incentives, such as autonomy, intrinsic motivation and value involvement.

In the fundamental work of Ryan R. and Deci E. [18] presents the theory of self-determination as one of the leading in understanding the motivation of employees, in particular managers. The authors identify three key psychological needs – autonomy, competence and interconnectedness – as the basis of intrinsic motivation. Work is of great importance for the formation of modern personnel management systems at enterprises. In the review McAnally K. and Hagger M. [15] shows how the form of motivation (autonomous or controlled) and the satisfaction of basic psychological needs (autonomy, competence, involvement) affect work outcomes. It also outlines methodological limitations of existing research and suggests directions for future research, including strengthening the influence of self-determination in management practice.

Domestic researchers such as Gorodianska L. [10], Yakovenko V. and Gromova O. [21] emphasize a strategic approach to developing managerial competencies and leadership qualities, considering the challenges of globalization, technological change, and the imperative of continuous learning.

Herzberg F. in his classic article [12] formulates a two-factor theory of motivation – the separation of hygiene factors (salary, working conditions) and motivational factors (recognition, achievement, growth). This research is still actively used in the management of enterprise managers, especially in the issues of building an effective motivational policy. The analysis of Herzberg's theory was further developed in work [5], where Dubrova N. emphasizes the significance of both motivational and hygiene factors for enhancing professional satisfaction and organizational development, as well as examines their practical application in human resource management.

The issues of activating professional development of personnel in domestic enterprises through motivational management tools have been examined in the works of Gorodianska L. [9], Semykina M., Dudko S., Orlova A., and others [19]. These studies reveal the essence and methods of managing professional development from the standpoint of motivational management. They also identify current challenges in personnel development within Ukrainian enterprises, particularly in the context of European integration.

Separate studies address various aspects of personnel management and motivation, including the transformation of enterprise personnel management systems (Brych V., Borysiak O., Bilous L. and Galysh N.) [2]; the systems of professional development of managers in transnational corporations in Germany and Poland (Banit O.) [1]; practical aspects of applying motivational measures for managerial professional development under crisis conditions affecting the Ukrainian economy (Gorodianska L.) [9]; as well as the features and current problems of personnel motivation at Ukrainian enterprises during wartime (Yefanov V. [22]; Kohut I. [14]).

Analysis of research shows that in conditions of instability of the external environment, crisis situations [9; 14] and martial law in the state [22; 11; 17] the motivational system of professional development of managers of business entities undergoes deformations, and the effectiveness of traditional methods of stimulation decreases. Such a state emphasizes the importance of moral support, trust in management, value leadership, corporate solidarity, development of emotional intelligence and team interaction at enterprises [8].

**Purpose, objectives and research methods.** The purpose of the study is to substantiate the role of motivation in the professional development of managers of business entities in crisis conditions and analyze its impact on the economic efficiency of enterprises.

Achieving the goal involves solving the following tasks:

− to determine the types, forms and directions of professional development of managers of business entities;

− to determine the role of motivation in the professional development of managers of business entities;

− to systematize the types of motivation in emergency situations and analyze the forms of motivational influence on managers in a crisis environment;

− to assess the impact of managers' motivation on the effectiveness of financial and economic activities of business entities in crisis and war.

The study uses the methods of system analysis, typology, expert assessment, comparative analysis of motivational models and inductive generalization. The study is based on an interdisciplinary approach that combines the theories of personnel management as an economic resource, crisis management and social psychology.

**Research results.** The study showed that the professional development of managers of business entities is a continuous, purposeful process of forming, improving and adapting the managerial competencies, knowledge, skills and personal qualities of the manager, which ensures its compliance with the modern requirements of the business environment and contributes to the sustainable development of the enterprise. This process includes both formal training and informal experience acquisition, development of strategic thinking, leadership, innovation and digital competence. Effective implementation of this process ensures the adaptation of the enterprise to the changing environment, increasing its efficiency and innovative potential.

It has been established that the methodological basis of the professional development of managers of business entities are certain conceptual approaches. For example, a systemic approach, according to which professional development is considered as an element of the general personnel management system of the enterprise. A competency-based approach, which focuses on the formation and development of key competencies of the manager (managerial, communicative, digital, analytical). A personality-oriented approach, which takes into account the individual characteristics of the manager, motivations, goals and potential of the manager in professional development. An axiological approach, which involves the formation of values of managerial activity, in particular ethics, responsibility, sustainable thinking. An innovative approach, which develops the manager's ability to introduce innovations and flexibly respond to changes.

The scientific foundation of the professional development of managers is formed by: the works of domestic and foreign scientists (Kuzmin O., Gerasymchuk Z., Melnyk O.); classical and modern management theories (Taylor F., Mintzberg G., Drucker P.); motivational theories (Maslow A., Herzberg F., Ryan R. and Deci E.); concepts of organizational learning (Senge P.); approaches to leadership and transformational management (Kotter J. and Bass B.).

Professional development of managers of business entities covers several key types, each of which is aimed at certain aspects of personal and professional growth, namely:

1) Formal development, which means acquiring knowledge and skills through educational programs, including advanced training courses, MBA (Master of Business Administration), postgraduate education, etc.

2) Informal development through independent learning, mentoring, exchange of experience, participation in seminars, webinars, conferences and other events.

3) Organizational development through participation in internal trainings, project groups, change of functional responsibilities or job rotation.

4) Digital development through mastering digital management tools, Big Data, CRM (Customer Relationship Management), ERP (Enterprise Resource Planning), artificial intelligence in the business space.

5) Career development, which involves career planning, acquisition of new management functions, and promotion.

6) Innovative-cognitive development as a professional development of creative thinking, the ability to make unconventional decisions, an innovative approach to management.

7) Emotional-personal development, which means the development of emotional intelligence, the formation of «soft skills» and stress resistance.

Depending on the goals and resources of the enterprise, various forms of professional development are used, which include institutional training under higher education programs, certification courses, trainings conducted by third-party organizations. Also – corporate training under internal educational programs and business simulation programs, coaching, mentoring organized at the enterprise. Electronic learning (e-learning) in the form of online courses, mobile applications for self-study, virtual educational platforms. Training in the workplace using business games, mentoring, internships, shadow management, personnel rotation, educational projects, etc.

In the context of modern challenges, the following key areas of professional development for managers of business entities are highlighted:

− Digital transformation, which involves acquiring digital competencies, in particular knowledge in the field of Big data, artificial intelligence, CRM systems, and automation.

− Leadership and strategic management, which develop leadership qualities, the ability to have a strategic vision and make effective management decisions.

− Cross-cultural communication, which forms intercultural competencies necessary for working in international markets.

− Innovative thinking, which ensures the development of creativity, flexibility, readiness for change, and the implementation of innovations.

− Change management, which involves mastering change management tools for effective adaptation to a dynamic business environment.

− Environmental and social responsibility, which provide increased awareness of the principles of ESG (Environmental, Social and Corporate Governance), sustainable development, and ethical business conduct.

Thus, the professional development of managers in the field of entrepreneurship is an important prerequisite for ensuring the competitiveness of business entities in the conditions of the modern economy. An integrated approach to the implementation of this process, combining various types, forms and directions of development, allows you to form competent, innovative and socially responsible managers. A successful professional development strategy should be based on a combination of the individual needs of the manager, his motivation, the strategic goals of the enterprise and the challenges of the external environment. The role of motivation in the professional development of managers of business entities is decisive, since it is precisely motivational factors that serve as an internal driver for improving knowledge, skills, competencies and managerial efficiency in a dynamic business environment. War and general socio-economic instability significantly change the structure of managers' motivation. In such conditions, priorities shift from an orientation towards strategic growth to maintaining stability, security, adaptation to new challenges and ensuring the survival of the business. This forms a new paradigm of motivation that takes into account extraordinary external factors (Table 1).

Motivation in professional development in crisis conditions acquires a specific meaning. On the one hand, the influence of existential factors is growing: security, stability, social support. On the other hand, internal motives are becoming more relevant: the desire to be useful, to participate in the restoration of the country, to support the team.

*Table 1. Key factors influencing the impact of crisis and war on managers' motivation*

| Factor | The essence of the impact |
|---|---|
| Market instability | Declining income, reduced orders, staff reductions demotivate due to uncertainty |
| Threat to personal safety | Increases the need for stability, social guarantees, work with a flexible schedule |
| Decreased solvency | Limitations in material incentives reduce the effectiveness of traditional motivation |
| Psycho-emotional exhaustion | High levels of stress lead to burnout, reduced intrinsic motivation |
| Business migration and relocation | Managers lose a stable environment, the team and values change |
| Increased workload | Reduction in staff and the need to make non-standard decisions lead to overwork |

*Source: developed by the author*

Classical theories of motivation (Maslow's hierarchy of needs, Herzberg's two-factor theory, Vroom's expectation model) in war conditions require adaptation. Basic needs (security, confidence in the future), as well as motivation through values, solidarity and mission, come to the fore. In view of this, the main motivational aspects of professional development of managers of business entities in crisis conditions can be characterized as follows.

For many managers, motivation for development is formed as a response to the need to support the state, preserve jobs, help the army or communities. That is, there is a manifestation of social responsibility and patriotism here. Other managers realize that the development of new skills (in particular, crisis management, digital transformation, logistics, international communications) is critically necessary for the continuation of the enterprise, the survival of the business. Motivation for leadership, emotional stability and stress management is enhanced by the desire to be a support for the team experiencing common losses, and support for the collective. Some managers see in the crisis an opportunity for professional growth, a change of specialization, entering new markets, including international ones, which contributes to career mobility. Despite limited resources, flexible financial incentives (bonuses for crisis decisions, participation in grant programs) remain an important factor in strengthening motivation and supporting certain financial incentives. But in crisis conditions and war conditions, various kinds of motivation barriers always arise. Chronic stress, loss of housing or relatives, a threat to life weaken the ability to self-realize and cause psycho-emotional exhaustion. Delays in payments, salary cuts reduce extrinsic motivation, create financial instability. The uncertainty of the future makes long-term career planning impossible. In many regions of Ukraine, due to limited access to quality educational platforms, restrictions on electricity supply and access to the Internet, there is a decrease in the desire to use available educational resources.

Practical approaches to motivating the professional development of managers of business entities in the specified conditions should be considered, first of all, the introduction of non-material incentives: recognition of leadership efforts, involvement in strategic decisions, public approval, autonomy in decision-making. Also, the organization of flexible learning through online courses, short-term trainings, mobile applications with microlearning, adapted to the conditions of combat operations. Along with this, psychological support (coaching, mentoring, stress and burnout programs) will also be useful, integration of training into current activities (where professional development is considered as part of the implementation of real projects – learning through action), involvement in international programs through participation in foreign initiatives, grants, exchanges to acquire new competencies and expand contacts. In general, in crisis conditions, the role of motivation in the professional development of managers of business entities increases many times over. Not only the effectiveness of current management decisions depends on its level, but also the ability of business to survive, transform and develop in the post-crisis period. The formation of an adaptive, value-oriented motivation system will allow to activate the internal potential of managers, which is the basis for the sustainable recovery of the national economy.

In modern conditions, characterized by the continuous development of digital technologies, globalization, high competition and instability of the external environment, the motivations of managers of business entities are becoming more multifaceted and dynamic. They include not only material incentives, but also intangible factors related to professional self-realization, stability, values and development opportunities play a significant role. The study showed that the basic motivations of managers of business entities in modern conditions are as follows:

Material motivation, which consists of a competitive salary as a basic incentive for attracting and retaining talented managers, bonuses, premiums and social guarantees. Bonuses, premiums, and profit sharing form a system of rewards for results. Social guarantees cover health insurance, corporate benefits, and pensions. Rising inflation and labor market instability increase the importance of material motivation.

Professional self-realization is associated with the possibility of career growth, i.e. vertical or horizontal advancement, expansion of the role or functions; participation in strategic decision-making; implementation of ideas and initiatives with the opportunity to influence innovations in business. Professional self-realization is popular among young professionals who value work where one can realize one's own potential.

Educational and professional development, the basis of which is: forms of continuous improvement of knowledge, such as access to training, certifications, internships; expansion of connections and reputational capital through participation in conferences, forums, networking; support for internal growth through corporate training, coaching, mentoring. Given that in a dynamic environment, knowledge quickly becomes outdated, continuous learning becomes a key motive for professional development.

Recognition and authority – as public approval of work results (praise, awards, participation in ratings), influence in the team or industry (positioning as an expert, opinion leader) generate internal motivation for leadership, the desire to be a driver of change. In conditions of horizontal structures, recognition is a more effective motivator than a strict hierarchy. Work-life balance as one of the basic motives of managers of business entities in crisis and war conditions acquires particular relevance and importance. In such extreme situations, when the instability of the external environment is exacerbated, uncertainty is growing, and the risks of doing business are rapidly increasing, maintaining personal stability, psychological health and the ability to make effective management decisions are directly related to maintaining a balance between professional activities and personal life. This balance is achieved through adaptation to the digital space, the introduction of flexible schedules, the provision of remote work opportunities, autonomy in decision-making and other measures.

Value motivation is one of the basic motives of managers of business entities in times of crisis and war and acts as a driver of stability, cohesion and orientation of business towards long-term existence, even in extreme circumstances. Unlike material motivation, value motivation is based on deep internal beliefs, moral and ethical principles and the desire to act in the interests of society, country, community or team. In times of crisis and war, value motivation is the internal force that allows managers of business entities to maintain moral orientation, resistance to destructive influences, the ability to make decisions based on long-term priorities, not short-term benefits. Such motivation of the individual becomes the basis for the formation of an ethical culture of management, contributes to the consolidation of the team, forms a positive image of business as a responsible and socially significant entity in the conditions of national resistance and the prospects for the revival of the country.

The results of the study allowed us to compile a structural model of motivational support for the professional development of managers of business entities (Fig. 1).

Thus, the motivation of a modern manager of a business entity is a multifactorial system that encompasses both external (economic) and internal (psychological, value) factors. An effective motivation system should be adaptive, individualized and one that takes into account modern challenges and trends. This not only increases the efficiency of management, but also contributes to the sustainable development of the enterprise.

**Discussion.** The results of the study indicate a transformation of the motivational paradigm during the wartime period. The traditional hierarchy of needs, as proposed by Maslow, becomes is being transformed: security, support, and the recognition of the social significance of one's activity come to the forefront. These findings align with theories of intrinsic motivation advanced by Ryan R. [18], as well as with the concept of servant leadership by Goleman D. [7] and discussed by Jiang X. & Wei Y. [13]. War conditions activate managers' need to belong to a community capable of overcoming difficulties, which strengthens their loyalty to the organization even in the absence of significant material incentives. In crisis conditions and in war conditions, the types of motivation of managers of business entities are significantly transformed under the influence of an unstable environment, psychological pressure, limited resources and increased responsibility (Table 2).

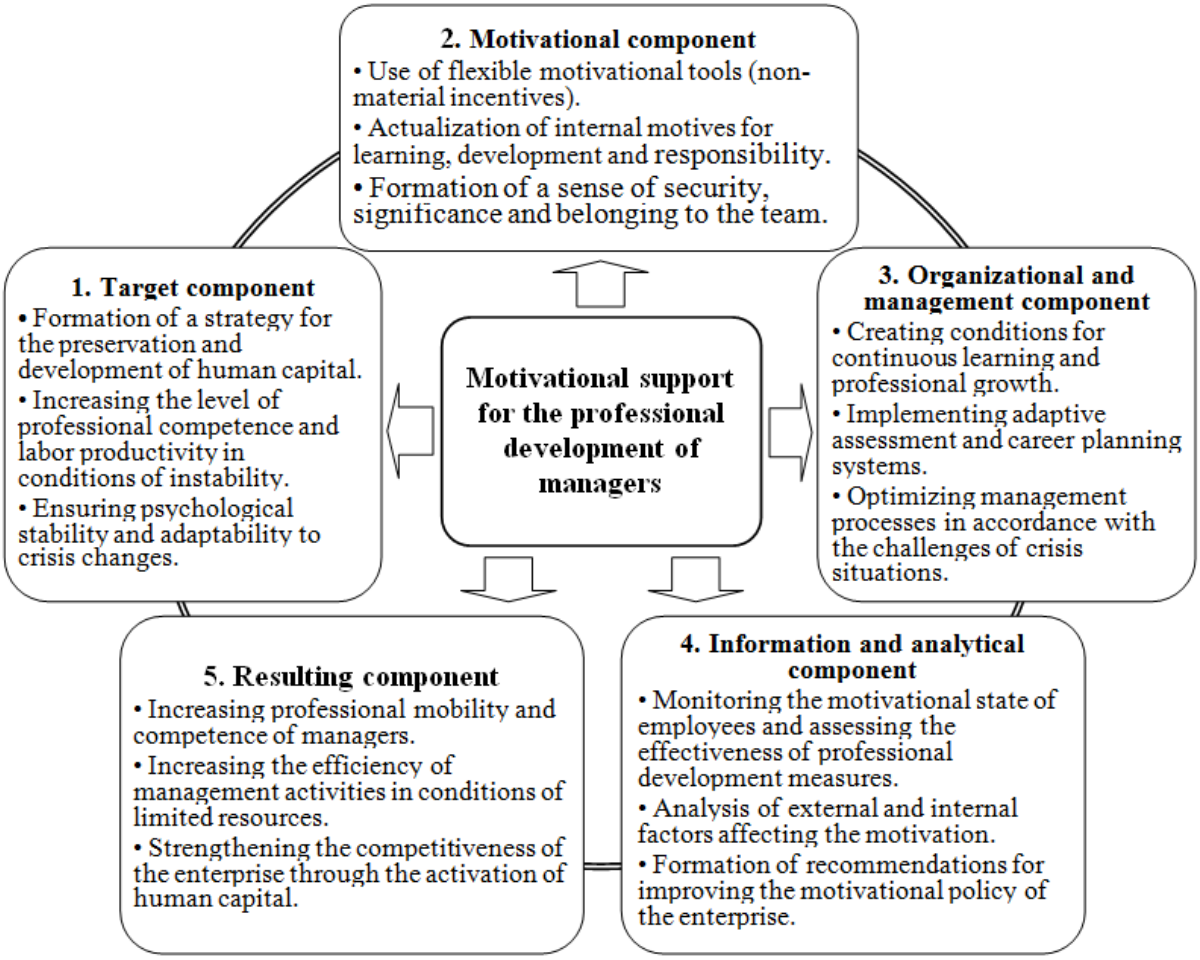


*Fig. 1 – Structural model of motivational support for managers of business entities*
*Source: developed by the author based on the results of the study*

In such situations, motivational factors acquire not only economic, but also deep value, social and existential content. Managers' motivation becomes multi-component, rational and emotional, material and spiritual factors are combined into a single system. If in conditions of stability economic motivation prevails, then during war and crisis priorities change, the role of value, social, work-life balance and existential motivation increases. Intangible motives begin to play a strategic role. It is intangible motives (values, responsibility, personal meaning) that provide long-term stability and moral strength of the manager, which is crucial in periods of turbulence. Effective managers of business entities in crisis conditions are forced to demonstrate flexibility of the motivational approach and the ability to quickly reorient motivational accents depending on the phase of the crisis, resource constraints and external challenges.

The results of the study made it possible to carry out an analytical review of current approaches to the types and forms of motivation of managers of business entities in crisis conditions, as well as to outline possible trends in their further transformation. It was established that the motivation of managers in crisis and war conditions significantly expands the boundaries of classical economic incentives. Value, psychological, innovative and patriotic factors are put to the fore, which form a new paradigm of managerial behavior. In the future, motivation will be transformed in the directions of deepening emotional intelligence, flexibility and self-realization, which will contribute to strengthening the organizational stability of enterprises. According to Goleman D. [7, p. 16], it is the level of emotional intelligence that determines who among a number of talented candidates within an intellectually demanding profession will be able to become the strongest leader.

*Table 2. Transformation of the motivation system in crisis conditions*

| Motivation systems | Normal conditions | Crisis conditions |
|---|---|---|
| Material motivation | Salary + bonuses for results | Minimum basic income maintenance |
| Career prospects | Systematic growth according to KPI | Temporary stop of vertical movements; preference for horizontal ones |
| Educational development | Trainings and courses | Online education; self-study |
| Nonmaterial motivation | Secondary role | Leading value: recognition, trust, support |
| Motivation to participate | Corporate goals | Social mission; support for the Armed Forces of Ukraine; assistance to the community |

*Source: developed by the author*

We believe that the trends and trends of transformation of types of motivation of managers in the future may be as follows:

− individualization of motivational strategies, which involves the transition from mass to personalized approaches based on the psycho-emotional state and life values of the manager;

− shifting the focus from material to moral and value incentives, according to which, in conditions of resource shortage, the emphasis shifts to recognition and a sense of involvement in a common cause;

− expanding the innovative space of motivation, when managers are increasingly motivated by freedom of decision-making, autonomy and the opportunity to form new practices.

− institutionalization of psychological support through the implementation of permanent corporate mental health programs, which should become a standard in personnel management;

− patriotism as a sustainable motivational platform;

− digitalization and gamification of motivation through the use of digital platforms for monitoring, recognizing achievements, and forming a competitive spirit in the team.

The following trends and trends of further transformation of the forms of motivational influence on managers of business entities should be considered:

− reorientation from material incentives to moral and value forms, since in conditions of limited funding the role of recognition, mission, patriotism and emotional support will increase;

− institutionalization of psycho-emotional support, when the constant presence of corporate psychologists, mentors, support systems will become a mandatory practice;

− strengthening of inclusiveness in management decisions by involving managers in the formation of anti-crisis strategies, which will contribute to increasing their involvement and responsibility;

− digitalization of gamification practices, in particular the development of internal platforms for motivation, ratings, challenges, competitions, etc.;

− development of educational and innovative programs as strategic motivation instead of temporary courses, building a permanent crisis training system aimed at adaptability;

− rooting of existential motivation as a response to deep uncertainty, in which business will turn to the internal values of the employee: humanity, dedication, mission;

− globalization of cultural motivations by creating universal corporate traditions (even online) as elements of the «social contract» between the company and managers.

In crisis and war conditions, the motivational impact on managers of business entities loses its traditional narrow economic coloring and acquires a multidimensional character, combining

economic, social, psychological, cultural and existential factors. In the future, those enterprises that are able to create a holistic, flexible and value-oriented motivation system adapted to conditions of high turbulence will be successful.

Therefore, systemic motivation of managers in times of war or crisis is not only a tool for preserving business, but also a factor of social stability, psychological balance and economic reconstruction. Its flexible combination allows you to make informed decisions, support people and maintain orientations in times of uncertainty.

In a crisis environment, especially in times of war, the effectiveness of management decisions largely depends on the correctly chosen forms of motivational influence on managers of business entities, in particular:

− there is no universal incentive – in times of crisis, motivational policy should be targeted, sensitive to the life and psychological circumstances of the manager;

− the most effective combination of flexible forms of stimulation works, when material incentives are supplemented with moral support, career opportunities, and recognition of values;

− it is important to form a corporate culture where the material is not separated from the human and existential, which creates trust and resistance to stress.

In such conditions, the motivational toolkit must adapt to limited resources, increasing psychological pressure, the need for prompt decision-making and work in conditions of risk. A systematic analysis of key forms of motivational influence on managers in a crisis environment has shown that the motivational focus shifts from material to moral and value-based. In a crisis, financial incentives are limited, so the importance of intangible forms increases significantly. Individualization of the approach becomes a key condition for effective motivational influence: some managers need autonomy, others need recognition or support. But a comprehensive combination of forms of motivational influence gives the best result. For example, a combination of material, value and social forms of motivation guarantees the stability and effectiveness of the management system of a business entity.

The value basis of motivation contributes not only to the professional development of managers, the formation of a sustainable management culture, but also affects the economy of business entities and survival in extreme conditions. The following should be considered key aspects of the impact of manager motivation on the economy of business entities.

Manager motivation in crisis conditions is not only a means of maintaining management efficiency, but also the basis of the economic endurance of the enterprise. Motivated managers are able to make informed decisions in conditions of resource shortage, adapt business models, maintain operational continuity even during hostilities, preserve and reorganize teams. This reduces the risk of loss of management capital and contributes to the economic survival of the business entity.

Innovative motivation of managers contributes to the emergence of new solutions, becomes a driver of innovative development and implementation of digital sales channels, anti-crisis logistics solutions, alternative personnel management, etc. All this supports the recovery of income, optimization of costs and opens up new markets, which directly improves the economic performance of business entities.

Career and professional motivation, participation of managers in crisis projects, educational programs, mentoring create a new layer of anti-crisis leaders who are ready to work in conditions of risk, limitations and uncertainty. This allows enterprises to maintain high quality management, respond quickly to changes, reduce costs due to the independent initiative of managers.

The connection between motivation and corporate cohesion contributes to the creation of a motivation system that is focused on support, recognition and common values, forms strong internal ties in the team, which reduces staff turnover, increases trust and reduces staff retention costs.

In general, the following economic consequences of the influence of managers' motivation on the economy of business entities can be distinguished: increased productivity of managers;

retention of clients through better response to challenges; saving resources through effective internal management; reducing losses from disorganization during crises.

Thus, the motivation of managers in crisis and war conditions is a system-forming factor that directly affects the economy of business entities. The most effective are complex motivational systems that combine material incentives with value, social and emotional factors. Successful enterprises are those that, in conditions of limited resources, were able to reorient themselves to moral and ethical incentives, institutionalize psychological support and provide managers with a mission, not just instructions. The ability to motivate in extreme conditions becomes a key competitive factor, and managers are a critical asset for the recovery of the economy and the reconstruction of the country.

**Conclusions.** Motivation of managers in emergency conditions acquires system-forming significance for ensuring the effectiveness of management decisions, adapting enterprises to external challenges, maintaining the continuity of business processes and the overall economic stability of business entities. Motivational factors play a decisive role in forming the internal readiness of managers for professional growth, self-realization, mastering innovative approaches and mobilizing management competencies. This leads to an increase in labor productivity, management quality and the level of responsibility of managers.

A transformation of the structure of managers' motivation in crisis conditions has been revealed: intangible factors come to the fore – value, social, moral, existential and patriotic motivation, while the role of material incentives is significantly reduced due to limited resources. In a crisis environment, the determining factor becomes the ability of business entities to form a system of moral and psychological support and a meaningful mission of activity.

It is substantiated that an effective motivation system should be adaptive, comprehensive and individualized, capable of combining material incentives with opportunities for professional growth, autonomy in decision-making, recognition of achievements, as well as support for socially significant values.

The direct economic effect of motivating managers has been established, which is manifested in increasing labor productivity, saving resources, reducing losses from disorganization, maintaining client relationships, reducing staff turnover, expanding the innovative capacity of enterprises and strengthening the competitiveness of business entities.

It is determined that in the post-crisis period, those business entities that are able to create an integrated system of motivating managers, focused on long-term goals, ethical principles of management, flexibility and humanity will have an advantage. A successful motivational policy in conditions of war and economic turbulence is a guarantee not only of business stability, but also a factor in the overall economic reconstruction of the country.

Given the results obtained, it is advisable to focus further scientific research on the following aspects:

- development of quantitative models for assessing the impact of motivational systems on the economic performance of enterprises;
- formation of an index of motivational stability of managers in crisis situations;
- comparative analysis of the effectiveness of motivational approaches in various sectors of the national economy and in the international context;
- research into digital, gamified and psychological tools for motivating managers in an environment of high turbulence;
- study of the long-term impact of intangible motivational factors on the stability of management decisions and the formation of the organizational culture of enterprises.

**References**

1. Banit, O. V. (2018). Professional development systems for managers in transnational corporations: the experience of Germany and Poland, 414 p. Retrieved from https://surl.li/hqzkik [in Ukrainian].
2. Brych, V., Borysiak, O., Bilous, L., & Galysh, N. (2020). *Transformation of the personnel management system of enterprises*, 212 p. Retrieved from https://surl.li/izkirv [in Ukrainian].

3. Cherusheva, G., & Parkhomenko, V. (2023). Models of managerial innovation competencies: structural and functional analysis. *Scientific thought development*, 2 (sge21-02), 29-41. DOI: https://doi.org/10.30890/2709-2313.2023-21-02-020 [in Ukrainian].
4. Drucker, P. (2005). Managing Oneself. *Harvard Business Review*. Retrieved from https://www.thecompleteleader.org/sites/default/files/imce/Managing%20Oneself_Drucker_HBR.pdf
5. Dubrova, N. (2024). Herzberg's two-factor theory of motivation: a critical view and practical application. Economy and Society, (68). DOI: https://doi.org/10.32782/2524-0072/2024-68-102 [in Ukrainian].
6. Fuchs, M., & Westermeyer, J. (2024). Situated between headquarters and local environment: local managers' scope for action in training activities. *Critical perspectives on international business*, 20 (1), 28-48. DOI: https://doi.org/10.1108/cpoib-06-2023-0046 .
7. Goleman, D. (2024). *Emotional intelligence*, 512 p.
8. Gorodianska, L. (2024). Directions of development of emotional intelligence and team interaction in enterprises. *Formation of Competencies of Gifted Individuals in the System of Extracurricular and Higher Education, 3, 197-205*. Retrieved from*https://er.nau.edu.ua/handle/NAU/66049* [in Ukrainian].
9. Gorodianska, L. V. (2025). Motivational aspects of professional development of foreign economic activity managers in crisis minds. *Actual problems in the system of education: general secondary education institution - pre-university training - higher education institution*, 5, 306-315. Retrieved from https://jrnl.nau.edu.ua/index.php/APSE/article/view/20282 [in Ukrainian].
10. Gorodianska, L. V. (2025). System for assessing managers' competency potential: methodological aspect. Educational analytics of Ukraine, 1 (33), 69-84. DOI: https://doi.org/10.32987/2617-8532-2025-1-69-84 [in Ukrainian].
11. Herasymenko, O., & Potapenko, A. (2023). Dominants of personnel motivation in the context of Ukrainian labor market transformations under martial law. *Economy and society*, 49. DOI: https://doi.org/10.32782/2524-0072/2023-49-46 [in Ukrainian].
12. Herzberg F. (1987). One more time: how do you motivate employees? *Harvard Business Review*, 5-16. Retrieved from https://www.insidemarketing.it/wp-content/uploads/2020/08/one_more_time_-_how_do_you_motivate_employees.pdf.
13. Jiang, X., & Wei, Y. (2024) Linking servant leadership to followers' thriving at work: self-determination theory perspective. *Front. Psychol*, Vol. 15. Retrieved from https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1384110/full.
14. Kohut, I. (2022). Analysis of motivation factors affecting teams in innovation projects during crisis and war, 40. DOI:https://doi.org/10.32782/2524-0072/2022-40-16 [in Ukrainian].
15. McAnally, K., & Hagger, M. S. (2024). Self-Determination Theory and Workplace Outcomes: A Conceptual Review and Future Research Directions. *Behavioral Sciences*, 14 (6), 428. DOI: https://doi.org/10.3390/bs14060428.
16. Mintzberg, H. (2009). Managers not MBAs: a hard look at the soft practice of managing and management development. *Berrett-Koehler Publishers*. Retrieved from https://www.bkconnection.com/static/Managers-Not-MBAs-EXCERPT.pdf.
17. Prodius, O., & Kapran, A. (2024). Improving the personnel management system under martial law. *Ekonomika ta suspilstvo*, (63). DOI: https://doi.org/10.32782/2524-0072/2024-63-131 [in Ukrainian].
18. Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55 (1), 68-78. DOI: https://doi.org/10.1037//0003-066x.55.1.68.
19. Semykina, M. V., Dudko, S. V., & Orlova, A. A., et al. (2021). *Professional development of enterprise personnel in the motivational management system, 440 p.* Retrieved from https://dspace.kntu.kr.ua/server/api/core/bitstreams/879a372a-bee4-41f0-8251-f7a4757f60fc/content [in Ukrainian].
20. Svitovy, O. M. (2021). Self-management as an effective tool for a manager's career growth. Scientific Bulletin of the Poltava University of Economics and Trade. Series "Economic Sciences", (2-2 (104), 54-60. https://doi.org/10.37734/2409-6873-2021-2-2-8.
21. Yakovenko, V. H, & Gromova, O. V. (2024). Consideration of the influence of social and psychological factors on human resource management in the conditions of crisis phenomena. *The bulletin of transport and industry economics*, 85, 125-135. DOI: https://doi.org/10.18664/btie.85.306555 [in Ukrainian].
22. Yefanov, V. (2025). Specificities of work motivation for ukrainian enterprises in war conditions. *Economy and society*, 71. DOI: https://doi.org/10.32782/2524-0072/2025-71-104 [in Ukrainian].

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**Мотивація менеджерів суб'єктів підприємницької діяльності в умовах кризи та війни: виклики та трансформації**

***Анотація.*** Стаття досліджує мотиваційні аспекти професійного розвитку менеджерів суб'єктів господарювання в умовах економічної турбулентності, кризи та війни, коли управлінський персонал виступає ключовим ресурсом забезпечення життєздатності та конкурентоспроможності бізнесу. Об'єктом дослідження є система мотивації менеджерів як основа їх професійного зростання, адаптивності та стійкості в екстремальних умовах.

**Постановка проблеми.** Основною проблемою визначено трансформацію традиційних підходів до мотивації в кризових умовах, коли матеріальні стимули значною мірою втрачають свою ефективність через обмеженість ресурсів, тоді як нематеріальні чинники (ціннісні, соціальні, патріотичні) набувають провідного значення.

**Невирішені аспекти проблеми.** Водночас залишаються невирішеними питання кількісної оцінки впливу мотиваційних систем на економічні результати підприємств, формування індексу мотиваційної стійкості менеджерів, а також дослідження новітніх цифрових та психологічних інструментів мотивації.

**Мета статті.** Метою статті є обґрунтування ролі мотивації у професійному розвитку менеджерів суб'єктів господарювання в кризових умовах та аналіз її впливу на економічну ефективність підприємств. У дослідженні застосовано методи системного аналізу, типології, експертного оцінювання, порівняльного аналізу мотиваційних моделей та індуктивного узагальнення.

**Виклад основного матеріалу.** Основна увага приділяється ідентифікації видів, форм і напрямів професійного розвитку менеджерів, трансформації структури мотиваційних факторів та їх інтеграції в управлінську практику. Результати дослідження свідчать, що мотивація в умовах кризи набуває комплексного характеру: на перший план виходять ціннісна, соціальна, мотивація балансу між роботою і особистим життям та екзистенційна мотивація. Ефективна система мотивації повинна бути адаптивною, індивідуалізованою та орієнтованою на поєднання матеріальних і нематеріальних стимулів. Це має теоретичне й практичне значення в контексті перспективи створення дієвої системи мотивації для менеджерів. Встановлено прямий економічний ефект мотивації менеджерів, що проявляється у зростанні продуктивності, зниженні витрат, зміцненні корпоративної згуртованості та посиленні інноваційного потенціалу підприємств.

**Висновки.** Зроблено висновок, що інтегрована система мотивації менеджерів у кризових умовах є не лише чинником стійкості бізнесу, але й запорукою економічного відновлення країни.

***Ключові слова:*** *мотивація, професійний розвиток, економічні ресурси, управління людськими ресурсами, війна, криза, суб'єкт підприємницької діяльності, економіка.*

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**Список літератури**

1. Баніт О. В. Системи професійного розвитку менеджерів у транснаціональних корпораціях: досвід Німеччини і Польщі : монографія. Київ : ДКС-Центр, 2018. 414 с. URL: https://surl.li/hqzkik (дата звернення: 26.06.2025).
2. Трансформація системи управління персоналом підприємств : монографія / В. Брич та ін. Тернопіль : ВПЦ «Економічна думка ТНЕУ», 2020. 212 с. URL: https://surl.li/izkirv (дата звернення: 27.06.2025).
3. Черушева, Г., Пархоменко, В. (2023). Моделі управлінських інноваційних компетенцій: структурний та функціональний аналіз. *European Science , 2* (sge21-02), 29-41. DOI: https://doi.org/10.30890/2709-2313.2023-21-02-020.
4. Drucker P. Managing Oneself. *Harvard Business Review*, 2005. URL: https://www.thecompleteleader.org/sites/default/files/imce/Managing%20Oneself_Drucker_HBR.pdf (дата звернення: 26.06.2025).
5. Дуброва Н. Двофакторна теорія мотивації Герцберга: критичний погляд та практичне застосування. *Економіка та суспільство*, 2024. Вип. 68. DOI: https://doi.org/10.32782/2524-0072/2024-68-102.
6. Fuchs M. & Westermeyer J. Situated between headquarters and local environment: local managers' scope for action in training activities. *Critical perspectives on international business,* 2024. 20 (1), 28-48. DOI: https://doi.org/10.1108/cpoib-06-2023-0046
7. Гоулман Д. Емоційний інтелект. Харків : Віват, 2024. 512 с.

8. Городянська Л. В. Напрями розвитку емоційного інтелекту та командної взаємодії на підприємствах. *Формування компетентностей обдарованої особистості в системі позашкільної та вищої освіти* : науковий журнал. Київ : НАУ. 2024. № 3. С. 197-205. URL: https://er.nau.edu.ua/handle/NAU/66049.
9. Городянська Л. В. Мотиваційні аспекти професійного розвитку менеджерів зовнішньоекономічної діяльності в кризових умовах. *Актуальні проблеми в системі освіти: заклад загальної середньої освіти – доуніверситетська підготовка – заклад вищої освіти : міжнародний науковий журнал*. Київ : Державний університет «Київський авіаційний інститут». 2025. № 5. С. 306-315. URL: https://jrnl.nau.edu.ua/index.php/APSE/article/view/20282 (дата звернення: 27.07.2025).
10. Городянська Л. В. Система оцінювання компетентнісного потенціалу менеджерів: методологічний аспект. *Освітня аналітика України* : науково-практичний журнал. Київ : ДНУ «Інститут освітньої аналітики». 2025. Вип. 1 (33). С. 69-84. DOI: https://doi.org/10.32987/2617-8532-2025-1-69-84.
11. Герасименко О., Потапенко А. Домінанти мотивації персоналу в контексті трансформацій ринку праці України в умовах воєнного стану. *Економіка та суспільство.* 2023. Вип. 49. DOI: https://doi.org/10.32782/2524-0072/2023-49-46.
12. Herzberg F. One more time: how do you motivate employees? *Harvard Business Review*, 1978. pp. 5-16. URL: https://www.insidemarketing.it/wp-content/uploads/2020/08/one_more_time_-_how_do_you_motivate_employees.pdf (дата звернення: 26.06.2025)
13. Jiang X. & Wei Y. (2024) Linking servant leadership to followers' thriving at work: self-determination theory perspective. *Front. Psychol.* URL: https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1384110/full (дата звернення: 27.06.2025).
14. Когут І. Аналіз факторів мотивації, які впливають на команди в інноваційних проєктах під час кризи та війни. Економіка та суспільство, 2022. Вип. 40. DOI: https://doi.org/10.32782/2524-0072/2022-40-16
15. McAnally, K., & Hagger, M. S. (2024). Self-Determination Theory and Workplace Outcomes: A Conceptual Review and Future Research Directions. *Behavioral Sciences*, 14 (6), 428. DOI: https://doi.org/10.3390/bs14060428.
16. Mintzberg H. Managers not MBAs: A Hard Look at the Soft Practice of Managing and Management Development Publisher: Berrett-Koehler Publishers, 2009. URL: https://www.bkconnection.com/static/Managers-Not-MBAs-EXCERPT.pdf (дата звернення: 26.06.2025).
17. Продіус О., Капран А. Удосконалення системи управління персоналом в умовах воєнного стану. *Економіка та суспільство.* 2024. Вип. 63. DOI: https://doi.org/10.32782/2524-0072/2024-63-131.
18. Ryan R. M., Deci E. L. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist.* 2000. Vol. 55. № 1. pp. 68-78. DOI: 10.1037//0003-066x.55.1.68
19. Професійний розвиток персоналу підприємств в системі мотиваційного менеджменту : колективна монографія / М. В. Семикіна та ін. Кропивницький : КОД, 2021. 440 с. URL: https://dspace.kntu.kr.ua/server/api/core/bitstreams/879a372a-bee4-41f0-8251-f7a4757f60fc/content (дата звернення: 26.06.2025).
20. Світовий О. М. Самоменеджмент як ефективний інструмент кар'єрного зростання управлінця. *Науковий вісник Полтавського університету економіки і торгівлі. Серія «Економічні науки».* 2021. (2-2 (104). С. 54-60. DOI: https://doi.org/10.37734/2409-6873-2021-2-2-8.
21. Яковенко В. Г., Громова О. В. Вплив соціально-психологічних чинників на управління людськими ресурсами в умовах кризових явищ. *Вісник економіки транспорту і промисловості.* 2024. № 85. С. 125-135. DOI: https://doi.org/10.18664/btie.85.306555.
22. Єфанов В. Специфіка мотивації праці для українських підприємств в умовах війни. *Економіка та суспільство.* 2025. Вип. 71. DOI: https://doi.org/10.32782/2524-0072/2025-71-104.

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# Business management in Ukraine in the context of the digital economy and wartime challenges

***Abstract.*** Business management in the context of the digital economy and military challenges is of particular relevance to Ukraine. The object of the study is the transformation of management processes of domestic enterprises under the influence of digitalization and crisis factors.

**Problem statement.** The problem lies in the significant digital divide between large businesses and small and medium-sized enterprises, the insufficient level of digital competencies of managers and employees, as well as cybersecurity risks and imperfect regulatory frameworks.

**Unresolved aspects of the problem.** The issues of forming comprehensive models for assessing the effectiveness of digital transformation, taking into account industry-specific features, and integrating public digital services into business processes remain unresolved.

**Purpose of the article.** The purpose of the article is to study the peculiarities of business management in Ukraine in the context of the digital economy and military challenges, and to identify the key risks and prospects for the digital transformation of enterprises.

**Presentation of the main material.** The article uses a combined approach that combines the analysis of scientific sources, statistical data and practical cases of Ukrainian and foreign companies. The author examines the impact of digital technologies on management decisions, organizational flexibility and business competitiveness. Particular attention is paid to the role of public policy, development of digital competencies of personnel, and adaptation of international experience to the conditions of the military crisis.

**Conclusions.** The results show that digitalization helps to increase productivity, optimize business processes, form new models of interaction and integrate Ukrainian enterprises into global markets. The practical significance of the study is to develop recommendations for entrepreneurs and government agencies on digital transformation strategies in times of war.

***Keywords****: digital transformation, digital competencies, innovations, innovative business models, small and medium-sized enterprises, state digital policy, global integration.*

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**Introduction.** The digital economy has become a crucial factor in the development of modern national economies, shaping new models of production, communications and business management. It is based on the use of information and communication technologies, e-commerce, and digital services that open up new opportunities for improving the efficiency of enterprises and their integration into the global economic space.

At the same time, digitalization brings new challenges: increased competition, the need for data protection, the rapid pace of technological change, and the need to develop digital competencies of staff. For Ukraine, these problems are exacerbated by the military situation, which creates additional barriers to business development and investment.

One of the main challenges is the digital divide between large companies and small and medium-sized businesses. While large corporations have the resources to implement modern technologies and cybersecurity systems, SMEs are often limited in terms of finances and personnel. An equally significant problem is the low level of digital literacy of managers and employees, which reduces the effectiveness of using new tools. Cybersecurity risks are also a particular threat, exacerbated by the growth of electronic transactions and data turnover.

The existing difficulties are compounded by the imperfection of the regulatory framework, which does not keep pace with technological change. As a result, businesses face legal uncertainty in the areas of e-commerce, personal data protection, and the use of cloud services.

At the same time, digital transformation opens up significant potential for Ukraine to modernize its business environment, increase its innovation potential, attract investment and create new markets. That is why it is important to find effective models of business management in the digital economy and develop strategies that can ensure the sustainability of enterprises and their competitiveness in the face of military challenges.

**Literature review.** The issue of business management in the context of the digital economy is attracting increasing attention from researchers around the world. Modern scholarly works show that digital transformation is not only a technological but also a strategic process that changes business models, market structure, and enterprise management.

Researchers, such as Yakushko [21], Melnyk and Ruda [9], and Mishchenko [12], emphasize the need to develop comprehensive approaches to the digitalization of management processes in Ukraine. They emphasize that digital transformation is characterized by high dynamics and requires the adaptation of management decisions and new competencies of managers. The works of Hrynko, Gviniashvili, and Kaliberda [5] and Nazarenko [13] note the impact of external challenges, in particular, military operations, on the speed and quality of the introduction of digital tools.

A special place in the scientific literature is occupied by e-commerce research. Its development in Ukraine is analyzed by Ilchuk, Kyrychenko, and Vodnytskyi [6], Berezovska and Kyrychenko [1], and Burka and Shkoda [3], who note that the war and global economic challenges both slow down and stimulate the development of online commerce. Sak [16] emphasizes the strategic guidelines of e-commerce and global trends, focusing on the importance of strategic diagnostics and the formation of new business models.

Foreign studies take a broader view of the digital economy. For example, Ciampi, Faraoni, Ballerini, and Meli [4] show that digitalization directly correlates with organizational flexibility of companies, ensuring their ability to quickly adapt to changes. Van de Wetering, Mikalef, and Pateli [18] confirm this with empirical results that demonstrate the importance of strategic alignment between IT agility and dynamic capabilities of organizations.

International organizations and think tanks make an important contribution to the study of digital transformation. The reports of the OECD [14; 15], World Bank [19], World Economic

Forum [20], McKinsey & Company [8], and the Brookings Institution (Ingram and Vora) [7] note that digitalization is a key factor in increasing the competitiveness of countries and one of the main tools for economic recovery after crisis shocks. In particular, the OECD and World Bank documents emphasize the role of digital policy in economic recovery, while McKinsey analyzes the development of artificial intelligence as a driving force for digital change.

Modern Ukrainian developments also complement the global picture. For example, Sycheva, Osypenko, and Petrishyna [17] study digital marketing as a tool for sustainable business development. The Ministry of Digital Transformation of Ukraine [10; 11] has developed a framework of digital competencies for citizens and presented the results of regional digitalization, which demonstrates the importance of public policy in the development of the digital economy.

Thus, the literature review shows that the digital economy is viewed as a complex process that combines technological innovation, strategic management, and socio-economic aspects of development. Ukrainian and foreign research complement each other: the former focuses on local challenges, including military ones, while the latter forms the theoretical foundations and global approaches to digital business transformation. This creates the basis for further research to improve business management models in the digital economy and crisis situations.

**Purpose, objectives and research methods.** The purpose of the article is to study the peculiarities of business management in Ukraine in the context of the digital economy and military challenges, to identify the key barriers to digital transformation and to outline the prospects for improving the efficiency of management practices of enterprises.

To achieve this goal, the following tasks are envisaged:

- to analyze modern scientific approaches to business management in the digital economy, taking into account foreign and Ukrainian experience;
- вto identify key challenges and barriers to the introduction of digital technologies into business processes;
- to explore the risks of digitalization and their impact on the effectiveness of management decisions;
- to outline promising areas for improving the efficiency of business management in the digital environment;
- to formulate practical recommendations on digital transformation strategies aimed at increasing the competitiveness and sustainability of enterprises.

The research methodology is based on an integrated approach that combines theoretical, empirical, quantitative and qualitative analysis. Theoretical methods include the systematization and generalization of scientific works of Ukrainian and foreign authors, which allowed us to define conceptual models of digital transformation and identify factors that affect the efficiency of business processes. Empirical methods involve the analysis of official statistics, government reports, industry reviews, and surveys of managers and specialists from various sectors. Quantitative methods include building indicators of the digital maturity of enterprises, using correlation and regression analysis to identify the relationship between the level of digitalization and the effectiveness of management decisions, and clustering enterprises by the degree of digital maturity and organizational flexibility. Qualitative methods include case studies of digital technologies implementation at specific Ukrainian enterprises, interviews with managers on the barriers and results of digitalization, content analysis of regulatory documents and strategic digital development programs.

A distinctive feature of the study is that it takes into account the military context, which affects the availability of resources, market structure, logistics processes, and the level of cyber risks. The study is interdisciplinary in nature, combining economic, managerial, technological, and social aspects, and its results are aimed at both the scientific community and practical managers and government authorities.

**Research results.** The development of the digital economy is significantly changing approaches to business management, creating new opportunities to improve the effectiveness of management decisions. According to research by international organizations, digital technologies not only optimize operational processes, but also create conditions for the formation of sustainable competitive advantages for enterprises. In particular, business process automation significantly reduces the time spent on data processing, reduces the likelihood of human error, and ensures a faster response to changes in the market environment [2].

Digital data management tools, such as Big Data and Business Intelligence, are shaping a qualitatively new level of decision-making. The use of large data sets in combination with artificial intelligence algorithms enables enterprises to more accurately predict demand, create personalized offers for customers, and optimize logistics chains. For example, Amazon and Alibaba actively use data analytics to improve the customer experience, allowing them to maintain their leading positions in the global market.

In Ukraine, the positive effect of business process digitalization is also evident. Companies that have implemented CRM systems and e-commerce platforms have seen an average sales growth of 15-20% in the first two years after integrating digital solutions. In the banking sector, an example of successful digital transformation is JSC CB PrivatBank, which was one of the first to introduce mobile banking and an online payment system, which reduced customer service costs and ensured high transaction speeds [8].

Digitalization contributes to increased productivity, reduced costs, personalized customer service, and strengthened competitive positions. Ukrainian companies are making significant progress in this area by using mobile applications, online platforms, CRM systems, and logistics process automation. To illustrate the key results, Table 1 summarizes international and Ukrainian experience.

*Table 1. Impact of digital solutions on business management efficiency*

| Country/company | Digital solutions | Result |
|---|---|---|
| Amazon (United States) | Big Data and artificial intelligence in logistics | Optimization of deliveries, reduction of delivery costs by 15% |
| Alibaba (China) | Cloud services and e-commerce platform | Personalization of offers for customers, sales growth by 25% |
| Siemens (Germany) | Industry 4.0, Internet of Things (IoT) | Automation of production, 20% increase in productivity |
| PrivatBank JSC (Ukraine) | Mobile banking, online payments | Reduction in maintenance costs, rapid growth of customer base |
| Rozetka (Ukraine) | CRM system and online sales platform | 18% increase in sales in the first 2 years of implementation |
| Nova Poshta (Ukraine) | Digital applications for customers and warehouse automation | Faster order processing, reduced delivery times |

*Source: complied by the authors based on [2, 11, 14, 15]*

International experience shows that digital technologies are becoming a key tool for ensuring business competitiveness, while examples from Ukrainian companies demonstrate their ability to effectively adapt global practices to local conditions. This confirms that digitalization is not only a requirement of the times, but also an effective mechanism for improving business management efficiency in Ukraine.

In the digital economy, the key factor for business success is not only the introduction of the latest technologies, but also the ability of organizations to adapt to rapid market changes. Organizational flexibility, manifested in the use of agile management methods (Agile, Scrum, Kanban) and the ability of staff to quickly acquire new skills, is the basis for the sustainability of enterprises in times of digital transformation.

According to the World Economic Forum report (Future of Jobs Report, 2023) [13], more than 44% of the core skills required of employees will change over the next five years. At the same time, the demand for digital competencies is growing the most: working with big data, artificial intelligence, cybersecurity, and process automation. A McKinsey study conducted in 2022 confirms that companies with a high level of digital literacy among their staff are 1.5 times more likely to achieve leadership positions in their industry.

In Ukraine, the issue of digital skills is also one of the most important. According to analytics from the Ministry of Digital Transformation of Ukraine for 2023, almost 53% of Ukrainians have basic digital skills, but only 15% have intermediate or advanced skills. This creates risks for businesses, as insufficient human resources can hinder the effective implementation of digital solutions. In response, the state is implementing educational programs based on the "Diia. Digital Education" portal, which has already attracted more than 2 million citizens.

Examples from Ukrainian businesses also demonstrate the importance of investing in staff development. In particular, Nova Poshta has introduced a corporate training program on digital services and logistics technologies, which has reduced operating costs by 12%. Kyivstar is developing competencies in the field of Big Data and analytics, which has enabled the company to increase its revenue from digital services by 27% in just one year.

At the international level, Microsoft is implementing a global initiative to retrain employees (Global Skilling Initiative), through which more than 50 million people have already acquired new digital skills. Similar programs are being implemented by Google and Amazon Web Services, which are creating corporate academies to support internal training [10].

Table 2 shows data on digital competencies and organizational flexibility with examples from Ukrainian and international companies.

*Table 2. Level of digital competence and organizational flexibility in business transformation*

| Company | Approach to staff development and flexibility | Result |
|---|---|---|
| Microsoft (USA) | Global Skilling Initiative, corporate courses on digital skills | Over 50 million people acquired new digital skills; increased team productivity |
| Google (USA) | Corporate academies and training courses on AI and big data | Improved digital literacy and adaptability of employees; rapid implementation of new projects |
| Amazon Web Services (USA) | Training programs for employees in the field of cloud technologies | Growth in internal competencies, reduction in time to implement new services |
| Diia. Digital Education (Ukraine) | Massive online courses on digital literacy for citizens | Over 2 million users attracted; improvement in basic digital skills |
| Nova Poshta (Ukraine) | Internal training courses and Agile programs for staff | 12% reduction in operating costs; improvement in service quality |
| Kyivstar (Ukraine) | Training programs in Big Data and analytics | 27% growth in revenue from digital services over the year; improvement in analytical capabilities |

*Source: complied by the authors based on [2, 11, 14, 15]*

Analyzing the data in Table 2, we can conclude that organizational flexibility and the development of digital competencies among staff directly affect the efficiency of business processes and the speed at which companies adapt to market changes. International experience shows that investments in training and retraining staff are strategically important for maintaining competitiveness. Ukrainian companies that actively implement digital skills development programs and apply flexible management methods achieve significant growth in productivity, operational efficiency, and customer satisfaction.

Recent research and practical examples prove that organizational flexibility and digital literacy of personnel are key factors in successful business transformation. Companies that invest in

employee training and development achieve significantly higher productivity, better adaptation to market changes, and strengthen their competitive positions in both domestic and global markets. A high level of employee qualification in digital tools ensures faster adaptation to change, while organizational flexibility allows companies to effectively implement new management models and respond to the challenges of the digital economy [14].

Global technology corporations such as Microsoft, Google, and AWS demonstrate significantly higher levels of digital competence and flexibility, confirming their leadership in the implementation of digital innovations. At the same time, Ukrainian companies and government initiatives, such as Diya. Digital Education, Nova Poshta, and Kyivstar, are gradually closing the gap by developing their own models of digital adaptation. This indicates the growing importance of investment in the development of personnel and organizational structures, which are key factors for successful integration into the global digital space.

It is expected that during 2025-2030, Ukrainian companies will significantly accelerate the pace of digital competence development through the active implementation of training programs, cooperation with international technology partners, and expanded access to IT education initiatives. According to forecasts by OECD and McKinsey analysts, by 2030, more than 70% of work processes in medium and large enterprises in Ukraine could be partially or fully automated. This will contribute to growing demand for specialists in digital analytics, cybersecurity, artificial intelligence, and data management.

Organizational flexibility, in turn, will become a determining factor in business sustainability, as companies with adaptive management models will be able to respond more quickly to global economic crises and technological changes. It is predicted that companies that systematically invest in the digital skills of their employees and the modernization of management practices will achieve 20-30% higher productivity compared to their competitors. Over the next few years, Ukraine has all the prerequisites to reduce the digital divide with developed economies and form its own competitive advantages in the global business environment [15].

Table 3 shows the projected directions for the development of Ukraine's digital economy in the medium term. The focus is on key aspects that determine the effectiveness of business management in the new conditions: the development of employees' digital competencies, the automation of business processes, the transformation of organizational models, increased productivity, and integration into global business networks.

*Table 3. Forecast of key trends in Ukraine's digital economy for 2025-2030*

| Key aspects | Forecast for 2025-2030 |
|---|---|
| Development of digital competencies | Growth to 80-85% coverage of employees by digital education programs |
| Business process automation | 70% of processes in medium and large companies are partially or fully automated |
| Demand for digital professions | High demand for specialists in AI, Big Data, cybersecurity |
| Organizational flexibility | Growth in the role of adaptive management models, rapid response to change |
| Business productivity | 20–30% higher performance among companies investing in digitalization |
| Global integration | Reduction of the digital divide, active participation in global business networks |

*Source: complied by the authors based on [2, 11, 14, 15]*

An analysis of forecast trends shows that by 2030, digitalization will become a determining factor in the development of Ukrainian business. Companies that invest in the development of their staff's digital skills and the automation of business processes will gain significant competitive advantages and will be able to integrate into global markets. At the same time, organizational flexibility is becoming an equally important condition for success, as the ability to quickly adapt to technological and market changes will determine the level of productivity and sustainability of

companies. Business management in Ukraine in the digital economy should be based on a balance between technological innovation and human capital development.

Fig. 1 summarizes the main trends in the development of Ukraine's digital economy for the period 2025-2030, reflecting the key vectors of change and opportunities for their practical implementation.

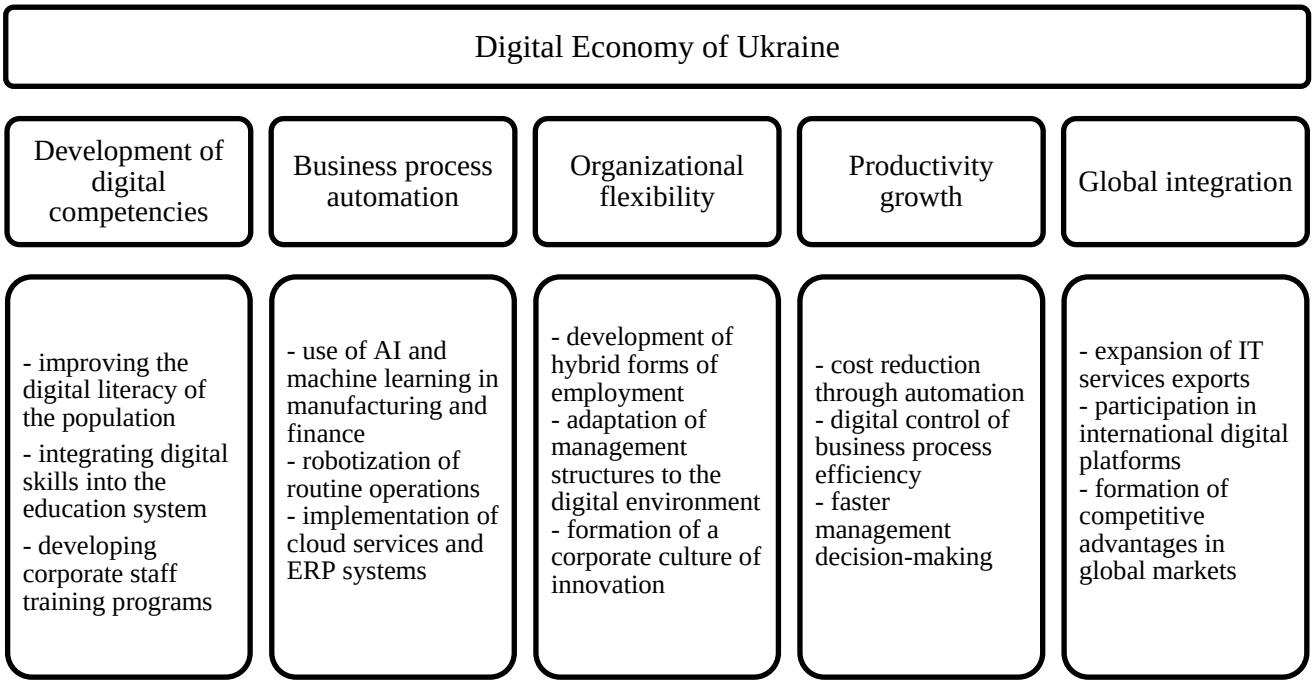


*Figure 1. Trends in the development of Ukraine's digital economy*
*Source: complied by the authors based on [2, 11, 14, 15]*

Small and medium-sized enterprises (SMEs) remain a key element of the Ukrainian economy: they account for over 99% of all companies, provide around 80% of jobs in the business sector, and generate over 68% of added value. Despite this contribution, most SMEs are concentrated in traditional sectors with low levels of innovation, such as trade and services, although there has been some growth in the share of enterprises in industry and IT in recent years [19].

The full-scale invasion has caused significant damage to the country's economic environment. Key challenges include the destruction of critical infrastructure, labour losses due to internal and external migration, supply and logistics disruptions, reduced exports and falling budget revenues. It is estimated that more than 60% of SMEs temporarily suspended operations in the first months of the war. However, about 80% of companies were able to resume operations within six months, although constant shelling, power shortages, and logistics problems continue to create obstacles to stable functioning.

Against this backdrop, the information and communication technology (ICT) sector is showing significant growth, providing new opportunities for economic growth and supporting business recovery. Digitalization contributes to improving business efficiency, reducing vulnerability to crises, and developing innovative services. Thanks to government initiatives such as the expansion of electronic services within the Diya platform and the introduction of electronic construction, digital technologies have become a tool not only for short-term recovery but also for long-term modernization of the economy.

Digital transformation has particularly great potential for SMEs, as limited resources make them more vulnerable to external shocks. Currently, Ukrainian small and medium-sized enterprises have not yet fully taken advantage of digital solutions: only half of medium-sized companies and

about a third of small companies have their own websites, while this figure reaches almost 70% for large enterprises. In addition, the level of use of modern digital tools and automation remains below average European standards, creating additional challenges for improving competitiveness.

During the war, the Ukrainian government continues to work actively on developing the SME sector and strengthening digitalization, in particular through the upcoming SME Strategy for 2024-2027. The Organisation for Economic Co-operation and Development supports Ukraine in shaping policies aimed at fully exploiting the potential of digital technologies for economic growth and recovery, offering analytical findings and recommendations for inclusion in government programmes and initiatives [20]. In this context, the key areas of action can be grouped into three main components:

1. Formation of an effective ecosystem for the digitalization of SMEs at the national and regional levels. Digital transformation is a priority for the government, which is being implemented through a number of strategic documents, including the National Economic Strategy until 2030 and the Global Innovation Vision of Ukraine 2030. However, there are not enough provisions specifically targeting SMEs. The optimal step would be to integrate measures for the digitalization of SMEs into a single coordinated policy document—a future SME Strategy or a special National Digital Strategy—with clear goals, measures, budget, and performance indicators. Significant efforts have already been made to build the institutional framework, including the creation of the Ministry of Digital Transformation of Ukraine in 2019 and the development of the Diya. Business platform and a network of Support Centers both in Ukraine and in Warsaw. At the same time, it is important to strengthen the role of Chief Digital Transformation Officers (CDTOs) at the local level and ensure regular information exchange between the public and private sectors, as well as raise awareness of digital services in small towns and villages.

2. Developing comprehensive programs to support the digitalization of SMEs. Despite existing measures, small and medium-sized enterprises often lack information about existing digital tools, the necessary skills, or available support services. Limited financial resources further hinder their digital transformation. To overcome these barriers, the government, through Diya and EEPO, offers a range of online services, but this is not enough to meet the diverse needs of SMEs. A smart move would be to develop a comprehensive support program that includes online digital maturity self-assessment tools, support for sectoral initiatives, and interaction with private consultants. In terms of financing, even with a limited budget for digitalization, it is possible to use co-financing mechanisms, vouchers, grants, and long-term incentives for investments in digital technologies.

3. Using digital technologies to overcome the consequences of war and restore the economy. Digital tools help SMEs adapt to trade disruptions, and e-commerce is growing, but its adoption among small businesses remains low, with only about 4–5% selling online. Targeted support, including logistics optimization, market awareness, and compliance with legislation, can significantly improve the situation. In addition, SMEs remain vulnerable to digital risks and cyberattacks, particularly due to the use of outdated or insecure software. Ukraine could strengthen cybersecurity measures, expand cooperation between stakeholders, and strengthen the regulatory framework to improve business resilience in the long term.

The table presents the main policy directions, recommendations, and proposed measures, divided into short-, medium-, and long-term actions.

Ukraine began actively developing centralized and regional digital policies even before the full-scale invasion began. These efforts became particularly important during the war, when digitalization became a key factor in the country's resilience. Innovative approaches aimed at ensuring uninterrupted service to citizens and countering cyber threats attracted the attention of the international community.

*Table 4. Recommendations for digitization and increasing the resilience of SMEs in wartime*

| Policy area | Recommendation | Proposed measures | Term | Implementation |
|---|---|---|---|---|
| SME digitalization ecosystem | Optimize SME digitalization policy | Integrate measures into a single strategic document | Short-term | Preparation of the draft SME Strategy 2024-27 |
| | | | Medium-term | Development of a National Digital Strategy for SMEs |
| | | | Long-term | Continuous monitoring, updating of documents, and budget planning |
| Institutional framework | Improve coordination and awareness | Strengthen the role of CDTO, raise awareness in small towns | Short-term | Conducting training seminars and campaigns |
| | | | Medium-term | Expanding the network of "Diia. Business" support centers |
| | | | Long-term | Ensuring stable public-private information exchange |
| Support for SME digitalization | Provide comprehensive support services | Online digital maturity assessment tool, consultations | Short-term | Launching online resources and self-assessment |
| | | | Medium-term | Sectoral support programs, cooperation with private consultants |
| | | | Long-term | Creation of a sustainable digital transformation program with budgetary support |
| Financing digitalization | Ensure access to finance | Vouchers, grants, co-financing | Short-term | Introduction of short-term incentives |
| | | | Medium-term | Creation of a co-financing system for SMEs |
| | | | Long-term | Long-term incentives for investment in digital technologies |
| Use of digital technologies | Overcome the effects of war and increase resilience | E-commerce, cybersecurity | Short-term | Support for SMEs in launching online sales, raising cyber awareness |
| | | | Medium-term | Optimization of logistics and adaptation to changes in legislation |
| | | | Long-term | Strengthening cyber resilience, long-term integration of digital solutions into business processes |
| Challenges of wartime | Improve SME resilience to crises | Business continuity, relocation, asset protection | Short-term | Providing information and advice on crisis management, operational support |
| | | | Medium-term | Creating a system for monitoring risks and responding to emergencies |
| | | | Long-term | Long-term sustainability planning, integration of anti-crisis mechanisms into SME strategies |

*Source: complied by the authors based on [2, 11, 14, 15]*

Ukraine's digital economy, especially the ICT sector, remained a key driver of development before the war, and its resilience was largely due to the coordination of actions following the

creation of the Ministry of Digital Transformation (MDT) in 2019. The MDT was tasked with streamlining the fragmented strategy of previous years and creating a unified approach with an authorized body to monitor implementation, respond to new needs, and digitize government operations, processes, and services.

Developing a comprehensive digital strategy requires clearly defined high-level goals and principles that will serve as the basis for planning in all areas of public policy. For Ukraine, the desire to integrate into the European Union has become a key factor in shaping national strategies and action plans.

After the full-scale invasion, EU support for Ukraine's digitalization has intensified [2]. Efforts are focused on ensuring uninterrupted digital communications and electronic services for citizens and authorities, which has become critically important in the context of cyberattacks on Internet infrastructure. The EU is also providing technical assistance to the Ministry of Digital Transformation in developing a National Strategy for Broadband Internet Access, which includes the rollout of high-speed fiber-optic networks and 5G technology.

The approach to the digitalisation of small and medium-sized enterprises (SMEs) must take into account the interests of all participants in the ecosystem in order to avoid duplication of efforts and make the most effective use of existing support readiness. Currently, a significant part of the funding for SME initiatives comes from international programmes and private funds, as the state budget is mainly directed towards wartime needs. Increasing the availability of domestic financing to support SMEs will remain critical in the long term.

Leading initiatives and institutions supporting SMEs reflect the influence of key international partners such as USAID, GIZ, and the EU. Among the largest donors are USAID and UKAID, which support the Prozorro and Trembita platforms; the Swiss Development Agency directs resources towards the digitization of public services and e-democracy, including tools for petitions and local budgets; the EU focuses on strengthening Ukraine's administrative capacity [10].

The US government was the main partner of the ICU initiative “Diia,” allocating $25 million for the initial development of the platform with the prospect of further funding through the state budget. USAID programs supported about 4,700 SMEs, providing grants and assistance worth $64 million under the Advantage Ukraine initiative. The EEPO budget for 2021 was €1.3 million, part of which came from the state and part from donors. After the start of the full-scale invasion, international funding increased, with state funds amounting to €900,000 and donor funding exceeding €1 million.

There are few direct investment funds in Ukraine, but those that do exist have a long history and play a key role in supporting SMEs. The Western NIS Enterprise Fund (WNISEF) has been operating for over 29 years, collaborating with the SME Center on projects for SMEs, providing financing and information support on government platforms. Horizon Capital has also been active in the country for over 29 years, providing financial support for SME development. Since the start of the war, WNISEF has raised over $250 million to support small and medium-sized businesses, becoming the first large fund of this scale to be approved by the President of Ukraine [15].

Civil society organizations play an important role in SME support initiatives, providing strategic and policy input and filling financial gaps. The recovery and development of SMEs after the war will require close coordination among partners on a large scale and the effective combination of public, international, and private resources.

The private sector plays a key role in the digitalization of SMEs, but interaction between different participants in the ecosystem needs to be further strengthened. The Ukrainian digitalization ecosystem benefits from the active participation of private companies and initiatives that promote the development of business support infrastructure, including incubators and accelerators. For example, Digital Boost Hub and the recently opened TechAdvance innovation accelerator provide entrepreneurs with expert support and training programs to accelerate digital transformation.

Business associations play a significant role in shaping policy and implementing SME digitalization projects. The Ukrainian Innovation Alliance (UIA), for example, brings together more than 1,500 companies in 45 clusters across various sectors, from engineering and IT to agribusiness, medicine, textiles, and construction. Some of these clusters also support defense and territorial initiatives. To provide financial support to SMEs, the UIA provides access to Horizon Europe programs and other international grant mechanisms, and promotes the development of international partnerships to create export opportunities and training programs for professional development [19].

The innovative models developed by the alliance envisage the phased development of infrastructure: the creation of support zones and value chains, innovation centers and laboratories, incubators, and experience zones. The UIA actively cooperates with international organizations such as the European Cluster Alliance and EIT Manufacturing to integrate Ukrainian SMEs into global innovation networks. In addition, there are a number of private innovation parks operating in Ukraine, including UNIT.City and UNIT.Kharkiv, which include research centers, educational institutions, and high-tech enterprises.

Despite these efforts, there are still limitations: the number of incubators, accelerators, and experience zones is still insufficient, and innovation parks face problems with supporting infrastructure, regulatory barriers, and a lack of sufficient investment incentives. Cooperation between the public and private sectors requires coordination, particularly with regard to the development of joint KPIs and tools to support the digital development of SMEs.

The Ukrainian government has identified digitalization as a priority policy area and has already developed a number of national strategies and documents outlining the state's ambitions for digital development.

An analysis of existing support services for SMEs in Ukraine has shown that digital centers in Ukraine already have a foundation in the form of Diya.Business and regional hubs, but they need to be scaled up and integrated. In the context of war, the key task is to develop mobile and offline formats that can operate with limited internet access.

Digital maturity self-assessment tools are still in their infancy, but their unification and adaptation to economic sectors will enable SMEs to develop realistic transformation plans. Military challenges require simple, flexible solutions that are accessible even without stable electricity and internet access.

Sectoral digital plans in Ukraine remain fragmented. There is a need for a unified methodology and coordination between industries. This is particularly relevant in wartime, as supply chains are disrupted and businesses relocate, changing the priorities of digitalization [8].

The development of digital skills and staff capacity has seen some success through Diia.Education and donor programs, but fragmentation remains the norm. It is important to introduce short distance learning courses and voucher programs to compensate for staff losses caused by evacuation and mobilization.

Financial support for the digitalization of SMEs is limited to grant and loan programs. In wartime, this is particularly problematic due to increased risks and a shortage of public resources. It is advisable to develop vouchers and co-financed grants that reduce the financial burden on businesses.

Overall, the analysis shows that Ukraine has already created basic mechanisms to support the digital transformation of SMEs, but their effectiveness is hampered by both systemic gaps (fragmentation, lack of coordination, limited funding) and specific challenges of wartime. This necessitates the adaptation of international practices to crisis conditions, a focus on flexible support instruments, and a strengthening of the state's role as a coordinator of business digital transformation.

Adapting international experience in digital transformation cannot be achieved by directly copying ready-made models. It is necessary to take into account the Ukrainian context, especially in the context of the military crisis. For example, the practice of creating “single window” digital

centers, which is widespread in EU countries, must be transformed into a format of mobile or online hubs capable of operating under conditions of limited infrastructure. Digital maturity self-assessment tools need to be simplified to be accessible to small businesses without the involvement of expensive consultants. It is also important to take into account the needs of relocated companies and regional differences in the level of digital infrastructure.

A key element of successful adaptation is the use of flexible tools that can be quickly scaled or transformed depending on the situation. These include:

- mobile digital hubs in safe regions;
- grant and voucher programs with minimal bureaucratic procedures;
- modular training programs on digital skills in online, offline, or blended learning formats;
- sectoral roadmaps for digitalization for the most affected industries (agriculture, logistics, manufacturing).
- Such tools enable businesses not only to survive but also to adapt to new conditions while remaining competitive.
- International experience shows that successful digitalization of SMEs in crisis conditions is only possible with clear coordination from the state. In Ukraine, this should be achieved through:
- the development of a unified national strategy for digital support of SMEs;
- the creation of a centralized platform with information on all assistance programs available to businesses;
- the introduction of mechanisms for co-financing digital projects;
- the simplification of regulatory procedures and the accelerated adaptation of the legislative framework.

Particular attention should be paid to creating backup digital solutions, such as cloud services and cyber security systems, which help reduce the risks of infrastructure loss. The development of public-private partnerships and continuous monitoring of program effectiveness will ensure rapid adjustment of support in line with business needs.

The adaptation of international practices in the field of digital transformation to Ukrainian crisis conditions should be based on flexible and easy-to-use tools (Table 5). The state plays a key role as a coordinator, combining the resources of business, international organizations, and the public sector. This approach not only allows overcoming the current challenges of wartime, but also lays the foundation for sustainable economic recovery through digitalization.

*Table 5. Adaptation of international digital transformation practices to the conditions of war in Ukraine*

| International practice | Ukrainian adaptation during the war | Expected effect |
|---|---|---|
| One-stop shops for business digitalization | Online platforms and mobile hubs in safe regions | Accessibility of information and support for SMEs even with limited infrastructure |
| Digital maturity self-assessment (online tools, consultations) | Simplified questionnaires and digital calculators with basic recommendations | Quick assessment of the state of the enterprise without significant costs |
| Sectoral digitalization roadmaps | Focus on priority sectors (agriculture, logistics, industry, IT) | Targeted assistance and concentration of resources on critical areas |
| Programs to improve staff digital skills | Short online courses, microlearning, modular programs with practical elements | Mass coverage of employees even in wartime conditions |
| Financial support (grants, loans, incentives) | Voucher systems, grant competitions with minimal bureaucracy, co-financing from the state | Operational access of businesses to resources for digitalization |

*Source: complied by the authors based on [2, 11, 14, 15]*

The study demonstrates that the adaptation of international digital transformation practices to the conditions of war in Ukraine is based on flexibility, accessibility, and resource prioritization. International tools such as one-stop shops, digital maturity self-assessment, sectoral roadmaps, training programs, and financial support are taking on specific forms in line with Ukrainian realities, where online centers and mobile hubs provide access to information and advice even in regions with limited infrastructure, Shortened questionnaires and digital calculators allow for quick assessment of the state of enterprises without significant time and resource costs, and a focus on critical sectors of the economy, such as agriculture, industry, logistics, and IT, contributes to the efficient use of limited resources. At the same time, short online courses and modular training programs ensure mass training of personnel even in wartime, while voucher systems, grants with minimal bureaucracy, and state co-financing allow businesses to quickly obtain resources for digitalization, emphasizing the speed, efficiency, and continuity of the digital transformation process.

As a result, the flexibility and adaptability of international practices allows businesses to operate in difficult conditions of war and limited infrastructure, digitization through online tools and mobile hubs provides equal access to information and training for small and medium-sized businesses, priority support for critical sectors of the economy increases the effectiveness of public policy, mass and rapid training of personnel strengthens digital literacy and business resilience, and state coordination and simplified financial support are key factors in the successful adaptation of international experience. Thus, the study confirms that the comprehensive adaptation of international digital transformation practices in wartime contributes to the resilience and competitiveness of Ukrainian businesses, ensuring the efficient use of resources and rapid response to wartime challenges.

**Discussion.** The results of the study confirm the key hypothesis that digitalization is a determining factor in improving business management efficiency and enterprise sustainability in the face of military challenges. In particular, the integration of solutions such as CRM systems, mobile banking, and logistics process automation leads to increased productivity and reduced operating costs for Ukrainian companies. This is consistent with the findings of Ciampi, Faraoni, Ballerini, and Meli, who emphasize that digitalization is directly related to the organizational flexibility of a business [4].

A comparison of international and Ukrainian cases (Amazon, Alibaba, Siemens, PrivatBank, Rozetka, Nova Poshta) shows that, despite differences in scale and resources, the basic trends are common: digital tools enable faster decision-making, deeper data analysis, and personalized customer interactions. This confirms the global thesis that digital transformation changes not only operational processes but also companies' business models [16].

The development of digital competencies among staff deserves special attention. Ukrainian examples (Nova Poshta, Kyivstar, the Diia. Digital Education initiative) show that investments in employee training and retraining directly affect the efficiency of business processes and the competitive position of enterprises. This is consistent with data from the World Economic Forum (2023), according to which more than 44% of employee skills will undergo transformation in the next five years [20].

At the same time, the results also indicate the existence of significant barriers. These include the digital divide between large businesses and SMEs, a lack of financial resources for innovation, low digital skills among some employees, and insufficient readiness of enterprises to implement cyber security systems. Similar challenges are described in studies by Berezovska and Kyrychenko [1] and Burka and Shkoda [3], which emphasize the vulnerability of small businesses to crisis shocks.

The war context increases the complexity of digital transformation, but at the same time creates momentum for more active implementation of digital solutions. For example, government e-services and the Diya platform have become tools for ensuring business and service continuity even

in wartime. This is consistent with the conclusions of the OECD [14; 15] and the World Bank [19], which emphasize the strategic role of digital policy in rebuilding the economy after crises.

The results obtained also demonstrate ambiguity: although digital solutions significantly improve management efficiency, their implementation does not always produce the expected results due to personnel and infrastructure constraints. This points to the need to adapt international practices to Ukrainian realities by creating mobile digital hubs, simplified digital maturity assessment tools, and flexible training programs for SMEs.

The limitations of the study lie in the dependence on the availability of statistical data and the difficulties of collecting quality information during martial law. In further scientific research, it is advisable to study in more detail the economic return on investment in digital competencies and organizational flexibility, as well as to assess the long-term impact of digitalization on the sustainability of Ukrainian enterprises.

Thus, the discussion confirms that digitalization is not only a technological but also a strategic factor in business development. Its success in Ukraine will depend on a combination of innovative technologies, human capital development, and active state support, which will ensure competitiveness in the global market even in the face of military challenges.

**Conclusions**. The development of the digital economy is radically changing approaches to business management, creating new opportunities to improve the effectiveness of management decisions and form sustainable competitive advantages for enterprises. Research by international organizations, including the World Economic Forum and the OECD, confirms that digital technologies not only optimize operational processes but also pave the way for more effective forecasting of market changes and adaptation of business models. Business process automation significantly reduces the time required to process information, lowers the likelihood of human error, and speeds up responses to fluctuations in supply and demand. The use of Big Data and Business Intelligence tools creates a new level of management decisions, providing the possibility of a personalized approach to customers and optimization of logistics chains, as proven by examples of global companies that actively use data analytics to increase efficiency and competitiveness.

In Ukraine, digitalization is also having a positive impact on business. Companies that have implemented CRM systems and e-commerce platforms are showing significant sales growth, and examples such as PrivatBank, Rozetka, and Nova Poshta demonstrate the effectiveness of mobile banking, online platforms, and logistics process automation. Digital tools make it possible to reduce costs, increase productivity, and strengthen competitive positions, while ensuring a quick response to changes in the market environment. This underscores the importance not only of technological innovation, but also of the ability of companies to adapt to market dynamics using flexible management methods such as Agile, Scrum, and Kanban.

Particular attention is paid to developing the digital skills of personnel. Analytics show that investments in training and retraining employees significantly increase productivity and the ability of companies to quickly implement innovations. More than 44% of core skills will undergo changes in the next five years, requiring active improvement of digital literacy. International corporations, including Microsoft, Google, and Amazon Web Services, are implementing global training programs, while Ukrainian initiatives such as Diia. Digital Education, Nova Poshta, and Kyivstar are showing positive results in improving digital skills and operational efficiency. This indicates a direct link between the level of digital competence and the speed at which businesses adapt to market changes.

Forecast studies indicate a significant acceleration of digitalization in Ukraine during 2025-2030. It is expected that more than 70% of work processes in medium and large enterprises can be partially or fully automated, which will stimulate demand for specialists in data analytics, artificial intelligence, cybersecurity, and information flow management. At the same time, organizational flexibility will become a key factor in the sustainability of enterprises, allowing them to respond quickly to technological and economic challenges, including crisis situations related to war and

infrastructure disruptions. Investments in employees' digital skills and the modernization of management practices are expected to increase productivity by 20-30% compared to competitors, facilitating the integration of Ukrainian companies into global business networks.

The SME sector plays an important role in the development of Ukraine's digital economy, accounting for over 99% of all enterprises, providing about 80% of jobs, and generating over 68% of added value. Despite their significant contribution, SMEs are often concentrated in traditional sectors with low innovation and underutilize digital solutions. In the context of war and limited resources, the state and international partners are implementing measures to support SMEs by creating a comprehensive digitalization ecosystem through the Diia platform, support centers, incubators, and accelerators. Cooperation with international donors such as USAID, the EU, and WNISEF provides financial and expert support for the implementation of digital technologies and the development of competencies. At the same time, there is a need for further coordination between the public, private, and civil sectors to avoid duplication of efforts and ensure the effective integration of SMEs into the digital economy [14, 15].

Prospects for further research in this area are related to studying optimal models of digital transformation for SMEs, assessing the effectiveness of investments in the development of digital competencies, and identifying mechanisms for increasing organizational flexibility in crisis situations. Another important area is research into the impact of digitalization on the integration of Ukrainian businesses into global economic networks and the formation of sustainable competitive advantages. Taking these aspects into account will provide a strategic basis for the development of the digital economy and the long-term sustainability of Ukrainian enterprises.

**References**

1. Berezovska, L., & Kyrychenko, A. (2022). Development of e-commerce in Ukraine and the EU. *Economy and Society, 42,* Article 42-15. DOI: https://doi.org/10.32782/2524-0072/2022-42-15 [in Ukranian]
2. Better Regulation Delivery Office (BRDO). (2024, June 10). *Digitalisation of Ukrainian SMEs: What was discussed at the workshop organised by the OECD.* Retrieved from: https://brdo.com.ua/en/news/tsyfrovizatsiya-ukrayinskogo-msp-pro-shho-govoryly-na-vorkshopi-organizovanomu-oesr/
3. Burka, B., & Shkoda, M. (2024). Development of e-commerce in Ukraine in the conditions of digital transformation, mobile technologies and economic instability caused by military actions. *Strategic Economic Research Journal, 6*(23), 8–17. DOI: https://doi.org/10.30857/2786-5398.2024.6.1 [in Ukranian]
4. Ciampi, F., Faraoni, M., Ballerini, J., & Meli, F. (2022). The co-evolutionary relationship between digitalization and organizational agility: Ongoing debates, theoretical developments and future research perspectives. *Technological Forecasting and Social Change, 176,* 121383. DOI: https://doi.org/10.1016/j.techfore.2021.121383
5. Hrynko, T., Gviniashvili, T., & Kaliberda, M. (2023). Strategic enterprise management in the digital economy. *Economy and Society, 50,* Article 50-71. DOI: https://doi.org/10.32782/2524-0072/2023-50-71 [in Ukranian]
6. Ilchuk, M., Kyrychenko, A., & Vodnitskyi, M. (2023). Development of e-commerce in Ukraine in the war and post-war conditions. *Science and Innovation, 19*(3), 3–14. DOI: https://doi.org/10.15407/scine19.03.003
7. Ingram, G., & Vora, P. (2024, January 30). Ukraine: Digital resilience in a time of war. *Brookings Institution, Center for Sustainable Development.* Retrieved from: https://www.brookings.edu/articles/ukraine-digital-resilience-in-a-time-of-war/
8. McKinsey & Company. (2022, December 6). *The state of AI in 2022—and a half decade in review* [Survey]. Retrieved from https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2022-and-a-half-decade-in-review
9. Melnyk, O. H., & Ruda, M. V. (2024). Strategic aspects of digital business transformation. *Management and Entrepreneurship in Ukraine, 2*(12), 196–209. DOI: https://doi.org/10.23939/smeu2024.02.196 [in Ukranian]
10. Ministry of Digital Transformation of Ukraine. (2021, March 30). *Digital competence framework for Ukrainian citizens* [PDF file]. Retrieved from: https://thedigital.gov.ua/storage/uploads/files/news_post/2021/3/mintsifra-oprilyudnyue-ramku-tsifrovoi-kompetentnosti-dlya-gromadyan/%D0%9E%D0%A0%20%D0%A6%D0%9A.pdf [in Ukranian]
11. Ministry of Digital Transformation of Ukraine. (2024, January 11). *Results of digital transformation in the regions of Ukraine for 2023.* Cabinet of Ministers of Ukraine. Retrieved from: https://www.kmu.gov.ua/news/rezultaty-tsyfrovoi-transformatsii-v-rehionakh-ukrainy-za-2023-rik [in Ukranian]
12. Mishchenko, V. I. (2022). Strategic management of digital transformation processes in the economy. *Economy of Ukraine, 1,* 67–81. Retrieved from: http://nbuv.gov.ua/UJRN/EkUk_2022_1_6 [in Ukranian]
13. Nazarenko, O. (2023, September). Digital transformation of Ukraine's economy in the conditions of war. *National Institute for Strategic Studies.* Retrieved from: https://niss.gov.ua/news/komentari-ekspertiv/tsyfrova-transformatsiya-ekonomiky-ukrayiny-v-umovakh-viyny-veresen-2023 [in Ukranian]
14. OECD. (2022, July 1). *Digitalisation for recovery in Ukraine.* OECD Policy Responses on the Impacts of the War in Ukraine. OECD Publishing. DOI: https://doi.org/10.1787/c5477864-en
15. OECD. (2024). *Enhancing resilience by boosting digital business transformation in Ukraine.* OECD Publishing. DOI: https://doi.org/10.1787/4b13b0bb-en

16. Sak, T. V. (2021). Electronic commerce: Global trends, diagnostics, strategic orientations. *Marketing and Digital Technologies, 5*(3), 30–42. DOI: https://doi.org/10.15276/mdt.5.3.2021.3 [in Ukranian]
17. Sychova, O., Osypenko, N., & Petrishyna, T. (2023). Digital marketing as a tool for sustainable business development. *Economy and Society, 50,* Article 50-32. DOI: https://doi.org/10.32782/2524-0072/2023-50-32 [in Ukranian]
18. Van de Wetering, R., Mikalef, P., & Pateli, A. (2018). Strategic alignment between IT flexibility and dynamic capabilities: An empirical investigation. *International Journal of IT/Business Alignment and Governance, 9*(1), 1–20. DOI: https://doi.org/10.4018/IJITBAG.2018010101
19. World Bank. (2023, November 30). *The World Bank and Ukraine: Laying the groundwork for reconstruction in the midst of war*. Retrieved from: https://projects.worldbank.org/en/results/2023/11/30/the-world-bank-and-ukraine-laying-the-groundwork-for-reconstruction-in-the-midst-of-war
20. World Economic Forum. (2023, April 30). *The future of jobs report 2023.* World Economic Forum. Retrieved from: https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf
21. Yakushko, I. (2022). The essence and features of digital transformation. *Problems and Prospects of Economics and Management, 4*(28), 75–82. Retrieved from: http://ppeu.stu.cn.ua/article/view/262608 [in Ukranian]
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**Управління бізнесом в Україні в контексті цифрової економіки та викликів воєнного часу**

***Анотація.*** Управління бізнесом в умовах цифрової економіки та воєнних викликів набуває особливої актуальності для України. Об'єктом дослідження виступає трансформація управлінських процесів вітчизняних підприємств під впливом цифровізації та кризових факторів.

**Постановка проблеми.** Проблема полягає у наявності суттєвої цифрової нерівності між великим бізнесом та малими і середніми підприємствами, недостатньому рівні цифрових компетенцій управлінців і працівників, а також у ризиках кібербезпеки та недосконалості нормативно-правової бази.

**Нерозв'язані аспекти.** Нерозв'язаними залишаються питання формування комплексних моделей оцінювання ефективності цифрової трансформації, урахування галузевих особливостей та інтеграції державних цифрових сервісів у бізнес-процеси.

**Мета статті.** Метою статті є дослідження особливостей управління бізнесом в Україні в умовах цифрової економіки та воєнних викликів, визначення ключових ризиків і перспектив цифрової трансформації підприємств.

**Основний матеріал.** У статті використано комбінований підхід, що поєднує аналіз наукових джерел, статистичних даних та практичних кейсів українських і зарубіжних компаній. Досліджено вплив цифрових технологій на управлінські рішення, організаційну гнучкість і конкурентоспроможність бізнесу. Особлива увага приділяється ролі державної політики, розвитку цифрових компетенцій персоналу та адаптації міжнародного досвіду до умов воєнної кризи.

**Висновки.** Результати свідчать, що цифровізація сприяє підвищенню продуктивності, оптимізації бізнес-процесів, формуванню нових моделей взаємодії та інтеграції українських підприємств у глобальні ринки. Практичне значення дослідження полягає у виробленні рекомендацій для підприємців і державних органів щодо стратегій цифрової трансформації в умовах війни.

***Ключові слова****: цифрова трансформація, цифрові компетенції, інновації, інноваційні бізнес-моделі, малі та середні підприємства, державна цифрова політика, глобальна інтеграція.*

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**Список літератури**

1. Березовська Л., Кириченко А. Розвиток електронної комерції в Україні та ЄС. Економіка та суспільство. 2022. Вип. 42. DOI: https://doi.org/10.32782/2524-0072/2022-42-15
2. Better Regulation Delivery Office (BRDO). Digitalisation of Ukrainian SMEs: What was discussed at the workshop organised by the OECD. 10.06.2024. URL: https://brdo.com.ua/en/news/tsyfrovizatsiya-ukrayinskogo-msp-pro-shho-govoryly-na-vorkshopi-organizovanomu-oesr/
3. Бурка Б., Шкода М. Розвиток електронної комерції в Україні в умовах цифрової трансформації, мобільних технологій та економічної нестабільності, спричиненої військовими діями. Проблеми розвитку: Журнал стратегічних економічних досліджень. 2024. Т. 6, № 23. С. 8–17. DOI: https://doi.org/10.30857/2786-5398.2024.6.1
4. Ciampi F., Faraoni M., Ballerini J., Meli F. The co-evolutionary relationship between digitalization and organizational agility: Ongoing debates, theoretical developments and future research perspectives. Technological Forecasting and Social Change. 2022. Vol. 176. P. 121383. DOI: https://doi.org/10.1016/j.techfore.2021.121383
5. Гринько Т., Гвініашвілі Т., Каліберда М. Стратегічне управління підприємством в умовах цифрової економіки. Економіка та суспільство. 2023. Вип. 50. DOI: https://doi.org/10.32782/2524-0072/2023-50-71
6. Ilchuk M., Kyrychenko A., Vodnitskyi M. Development of e-Commerce in Ukraine in the war and post-war conditions. Science and Innovation. 2023. Vol. 19, No. 3. P. 3–14. DOI: https://doi.org/10.15407/scine19.03.003
7. Ingram G., Vora P. Ukraine: Digital resilience in a time of war. Brookings Institution, Center for Sustainable Development. 30.01.2024. URL: https://www.brookings.edu/articles/ukraine-digital-resilience-in-a-time-of-war/
8. McKinsey & Company. The state of AI in 2022—and a half decade in review [Survey]. 06.12.2022. URL: https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2022-and-a-half-decade-in-review
9. Мельник О. Г., Руда М. В. Стратегічні аспекти цифрової трансформації бізнесу. Менеджмент та підприємництво в Україні. 2024. № 2(12). С. 196–209. DOI: https://doi.org/10.23939/smeu2024.02.196
10. Міністерство цифрової трансформації України. Рамка цифрових компетентностей для громадян України [PDF-файл]. 30.03.2021. URL: https://thedigital.gov.ua/storage/uploads/files/news_post/2021/3/mintsifra-oprilyudnyue-ramku-tsifrovoi-kompetentnosti-dlya-gromadyan/%D0%9E%D0%A0%20%D0%A6%D0%9A.pdf
11. Міністерство цифрової трансформації України. Результати цифрової трансформації в регіонах України за 2023 рік. Кабінет Міністрів України. 11.01.2024. URL: https://www.kmu.gov.ua/news/rezultaty-tsyfrovoi-transformatsii-v-rehionakh-ukrainy-za-2023-rik
12. Міщенко В. І. Стратегічне управління процесами цифрової трансформації економіки. Економіка України. 2022. № 1. С. 67–81. URL: http://nbuv.gov.ua/UJRN/EkUk_2022_1_6
13. Назаренко О. Цифрова трансформація економіки України в умовах війни. Національний інститут стратегічних досліджень. Вересень 2023. URL: https://niss.gov.ua/news/komentari-ekspertiv/tsyfrova-transformatsiya-ekonomiky-ukrayiny-v-umovakh-viyny-veresen-2023
14. OECD. Digitalisation for recovery in Ukraine. OECD Policy Responses on the Impacts of the War in Ukraine. Paris: OECD Publishing, 01.07.2022. DOI: https://doi.org/10.1787/c5477864-en
15. OECD. Enhancing resilience by boosting digital business transformation in Ukraine. Paris: OECD Publishing, 2024. DOI: https://doi.org/10.1787/4b13b0bb-en
16. Сак Т. В. Електронна комерція: глобальні тенденції, діагностика, стратегічні орієнтири. Маркетинг і цифрові технології. 2021. Т. 5, № 3. С. 30–42. DOI: https://doi.org/10.15276/mdt.5.3.2021.3
17. Сичова О., Осипенко Н., Петрішина Т. Цифровий маркетинг як інструмент сталого розвитку бізнесу. Економіка та суспільство. 2023. Вип. 50. DOI: https://doi.org/10.32782/2524-0072/2023-50-32
18. Van de Wetering R., Mikalef P., Pateli A. Strategic alignment between IT flexibility and dynamic capabilities: An empirical investigation. International Journal of IT/Business Alignment and Governance. 2018. Vol. 9, No. 1. P. 1–20. DOI: https://doi.org/10.4018/IJITBAG.2018010101
19. World Bank. The World Bank and Ukraine: Laying the groundwork for reconstruction in the midst of war. 30.11.2023. URL: https://projects.worldbank.org/en/results/2023/11/30/the-world-bank-and-ukraine-laying-the-groundwork-for-reconstruction-in-the-midst-of-war
20. World Economic Forum. The Future of Jobs Report 2023. Geneva: WEF, 30.04.2023. URL: https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf
21. Якушко І. Сутність та особливості цифрової трансформації. Проблеми і перспективи економіки та управління. 2022. Вип. 4(28). С. 75–82. URL: http://ppeu.stu.cn.ua/article/view/262608

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# Evolution of management theories in the context of business communication

***Abstract.*** This paper explores the evolution of management theories and their impact on business communication, focusing on the shift from rigid, hierarchical systems to adaptive, technology-enabled models. The research object is the dynamic relationship between managerial paradigms and communication strategies within organizations.

**Problem statement.** Although management theory and organizational communication are well-studied, the integration of classical principles with the demands of today's digital, globalized business environment remains insufficiently examined.

**Unresolved aspects of the problem.** Limited research addresses the adaptation of traditional models to digital contexts, the embedding of emotional intelligence into technology-mediated communication, and the influence of sustainability narratives on stakeholder relations.

**Purpose of the article.** The study aims to trace the progression of management theories in relation to business communication and to propose ways of integrating foundational principles with contemporary innovations.

**Presentation of the main material.** Employing a qualitative approach, the research synthesizes peer-reviewed literature, corporate case studies, and industry reports. It follows the historical path from Scientific Management and Administrative Theory to the Human Relations Movement, Systems Theory, and Contingency Theory, culminating in the digital era's emphasis on AI-driven tools, virtual collaboration, and cross-cultural competence. Findings reveal that while clarity and structure remain essential, adaptability, empathy, and technological integration are now critical for effective communication.

**Conclusions.** The results show that communication strategies must evolve alongside management paradigms to ensure organizational resilience. The study offers a framework for leaders to enhance collaboration, decision-making, and stakeholder trust. Future research should focus on AI ethics, neuroscience-based communication, and sustainability-oriented engagement.

***Keywords:*** *management theories, business communication, digital transformation, sustainability communication, adaptive strategies, organizational effectiveness.*

**JEL Classification:** M10, M12, M14, M15, M54, L22, L23

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**Introduction.** The study of management theories has long been intertwined with the development of communication strategies within organizations. The effectiveness of managerial decisions is largely dependent on how well information is transmitted, received, and interpreted across hierarchical levels. Over the past century, the evolution of management thought has introduced new communication paradigms, reflecting technological advancements, globalization, and cultural diversity. This paper investigates how management theories have evolved with regard to business communication, assessing their implications for contemporary business environments.

The evolution of management theories has been a cornerstone in shaping organizational practices, particularly in the realm of business communication. As organizations grow in complexity, the need for effective communication becomes paramount. This study aims to explore the interplay between management theories and business communication, tracing their development from classical to modern approaches. The relevance of this research is underscored by the increasing globalization of businesses and the advent of digital communication technologies, which have transformed traditional communication paradigms. The primary objective of this study is to provide a comprehensive analysis of how management theories have influenced communication practices and to offer insights into optimizing these practices for contemporary organizations.

The primary objective of this study is to analyze the evolution of management theories in relation to business communication and to evaluate how emerging technologies are reshaping managerial interactions. The specific research objectives include: examining historical management theories and their communication models; analyzing contemporary management communication frameworks; assessing the role of digital transformation in shaping business communication; identifying future trends in communication-based management practices.

The research employs a qualitative methodology, utilizing content analysis of peer-reviewed literature, case studies from multinational corporations, and industry reports. Comparative analysis is used to evaluate communication shifts across different management paradigms.

**Literature Review.** The evolution of management thought can be broadly classified into several major schools, each influencing business communication in distinct ways. Classical management theory, pioneered by Taylor [26] and Fayol [10], emphasized hierarchical structures and top-down communication, prioritizing efficiency over employee interaction. Behavioral theorists, such as Mayo [19] and McGregor [18], introduced a more human-centric approach, recognizing the role of informal communication networks. The systems and contingency perspectives of the 20th century further integrated communication as a dynamic component of management, highlighting its adaptability in different organizational contexts (Katz & Kahn [12]).

In recent decades, digital transformation and globalization have shifted management paradigms, fostering new communication models that integrate artificial intelligence, big data, and cross-cultural interactions (Drucker [5]; Brynjolfsson & McAfee [3]). Scholars argue that modern communication tools enhance managerial decision-making while simultaneously posing challenges such as information overload and ethical considerations (Goleman [8]; Davenport [4]). This study synthesizes existing literature to identify key trends and challenges in the evolution of management communication.

The literature on management theories and business communication is vast and multidisciplinary. Classical management theories, such as Frederick Taylor’s Scientific Management [26] and Henri Fayol’s Administrative Theory [10], emphasized hierarchical structures and formal communication channels (Taylor [26]; Fayol [10]). These theories laid the groundwork for structured communication within organizations but were often criticized for their rigidity.

The Human Relations Movement, pioneered by Elton Mayo [19] and Chester Barnard [1], shifted the focus to interpersonal relationships and informal communication networks (Mayo [19]). This era marked the beginning of a more people-centric approach to management and communication.

Contemporary theories, such as Systems Theory and Contingency Theory, have further refined the understanding of organizational communication. Systems Theory views organizations as interconnected systems where communication flows across multiple levels (Katz & Kahn [12]). Contingency Theory, on the other hand, posits that communication strategies must be tailored to specific organizational contexts (Fiedler [6]).

Recent studies have explored the impact of digital transformation on business communication, emphasizing the role of social media, virtual teams, and artificial intelligence (Leonardi et al. [16]; Treem & Leonardi [27]). These developments highlight the need for adaptive communication strategies that align with modern management practices.

Classical management theories, such as Scientific Management and Administrative Theory, continue to influence organizational communication, albeit in adapted forms. Recent studies have revisited these theories in the context of digital transformation. For instance, Smith and Johnson [23] analyzed how Taylor's principles of efficiency [26] can be applied to remote work environments, emphasizing the need for clear, structured communication channels. Similarly, García-Sánchez et al. [7] explored the relevance of Fayol's hierarchical communication model [10] in multinational corporations, noting its limitations in fostering cross-cultural collaboration.

The Human Relations Movement remains a cornerstone of modern communication practices, particularly in fostering employee engagement and collaboration. Recent research has highlighted the role of emotional intelligence and empathy in managerial communication. For example, Lee et al. [14] found that leaders who adopt a people-centric communication style are more effective in motivating teams and reducing turnover. Additionally, a study by Brown and Green [2] emphasized the importance of informal communication networks in promoting innovation, particularly in tech startups.

Systems Theory has gained renewed attention in the context of globalized and interconnected organizations. Recent studies have examined how communication flows across organizational boundaries, particularly in supply chain management and virtual teams. For instance, Zhang et al. [29] investigated the role of integrated communication systems in enhancing supply chain resilience, highlighting the importance of real-time information sharing. Similarly, Müller and Schmidt [20] explored the challenges of managing communication in virtual teams, proposing a systems-based approach to improve coordination and trust.

Contingency Theory has been widely applied to understand the dynamic nature of business communication in diverse organizational contexts. Recent research has focused on the role of adaptive communication strategies in responding to external disruptions, such as the COVID-19 pandemic. For example, Suntsova [24, 25], Nguyen et al. [21] analyzed how organizations adapted their communication strategies during the pandemic, emphasizing the need for flexibility and empathy. Another study by Patel and Carter [22] highlighted the importance of context-specific communication in multicultural teams, suggesting that managers tailor their approaches to align with cultural norms.

The advent of digital technologies has revolutionized business communication, prompting a reevaluation of traditional management theories. Recent studies have explored the impact of social media, artificial intelligence, and virtual reality on organizational communication. For instance, Leonardi and Treem [17, 27] examined how enterprise social media platforms facilitate knowledge sharing and collaboration, noting their potential to bridge hierarchical gaps. Similarly, a study by Wang et al. [28] investigated the use of AI-powered chatbots in customer service, highlighting their ability to enhance efficiency while posing challenges related to human-AI interaction.

Recent research has identified several emerging trends in the intersection of management theories and business communication. These include the growing importance of sustainability communication, the role of storytelling in leadership, and the integration of neuroscience insights into communication strategies. For example, Jones et al. [9] explored how sustainability narratives influence stakeholder engagement, suggesting that managers adopt a values-based communication

approach. Additionally, a study by Kim and Park [13] highlighted the potential of neuroscience to enhance understanding of communication dynamics, particularly in high-stress environments.

Recent studies highlight the need for adaptive, inclusive, and technology-driven communication strategies that align with contemporary organizational challenges. While classical theories provide a foundational understanding, modern paradigms emphasize flexibility, empathy, and innovation. Future research should continue to explore the integration of emerging technologies and interdisciplinary insights to further enhance organizational communication practices.

**Purpose, objectives and research methods.** The methodology employed in this study is rooted in a qualitative and analytical approach, designed to explore the evolution of management theories and their impact on contemporary business communication practices. The research is based on a comprehensive review of scholarly literature, historical texts, and case studies, which collectively provide a robust foundation for understanding the theoretical and practical dimensions of the topic.

To begin, a systematic literature review was conducted to identify key management theories and their contributions to the field of business communication. This involved analyzing seminal works by theorists such as Frederick Taylor [26], Henri Fayol [10], Elton Mayo [19], Paul Hersey, Kenneth Blanchard, and James MacGregor Burns, among others. The selection of these theories was guided by their historical significance and enduring relevance to modern organizational practices. Peer-reviewed journal articles, books, and conference papers were examined to trace the development of these theories over time and to identify their core principles.

In addition to the literature review, a comparative analysis was undertaken to examine how these theories have been adapted and applied in contemporary business settings. This involved studying real-world examples and case studies from diverse industries to illustrate the practical implications of each theoretical framework. Particular attention was paid to the role of technology, globalization, and changing workforce dynamics in shaping modern communication practices.

The research also incorporated a critical evaluation of the strengths and limitations of each management theory in the context of current business challenges. This evaluation was informed by insights from academic debates, expert opinions, and empirical studies, allowing for a nuanced understanding of how these theories have evolved to meet the demands of the digital age.

To ensure the validity and reliability of the findings, the study adhered to established academic standards for qualitative research. This included triangulating data from multiple sources, maintaining a rigorous and transparent analytical process, and critically reflecting on potential biases or limitations. The integration of historical perspectives with contemporary applications provided a holistic view of the topic, enabling the identification of key trends and best practices in business communication.

Overall, the methodology adopted in this study combines theoretical analysis with practical insights, offering a comprehensive exploration of the evolution of management theories and their relevance to modern business communication. By bridging the gap between theory and practice, this research aims to contribute to the ongoing discourse on effective communication strategies in a rapidly changing business environment.

**Research results.** The early 20th century saw a rigid communication structure in organizations, where managers issued directives through formalized channels. Taylor's scientific management [26] promoted strict adherence to instructions, minimizing worker autonomy in decision-making. Fayol's administrative theory [10] reinforced a linear communication process, emphasizing discipline and clear command chains.

Behavioral theorists later challenged these rigid structures. The Hawthorne Studies (Mayo [19]) revealed the significance of informal communication networks, while McGregor's Theory X and Theory Y [18] underscored how managerial attitudes influence communication openness. The transition from a mechanistic to a human-oriented communication approach marked a pivotal shift in management philosophy.

During the mid-20th century, systems theory (Katz & Kahn [12]) and contingency theory (Lawrence & Lorsch [15]) introduced a more flexible understanding of communication. Organizations were viewed as open systems interacting with their environment, requiring dynamic communication mechanisms. The contingency approach posited that communication effectiveness depended on contextual factors, such as industry type and organizational structure.

The rise of information technology and artificial intelligence has significantly altered business communication. Digital platforms facilitate real-time interactions, flattening hierarchical structures and fostering participatory decision-making. Studies highlight that AI-driven communication tools enhance efficiency but also raise concerns about human oversight and bias (Brynjolfsson & McAfee [3]). Moreover, globalization necessitates intercultural communication competence, as diverse teams operate in virtual environments (Hofstede [11]).

The findings reveal a clear progression in the relationship between management theories and business communication. Classical theories emphasized top-down communication, with a focus on efficiency and control. The Human Relations Movement introduced the concept of two-way communication, fostering employee engagement and collaboration.

Modern theories, such as Systems Theory and Contingency Theory, advocate for flexible communication strategies that adapt to organizational needs. The rise of digital technologies has further transformed communication, enabling real-time interactions and global collaboration. Case studies of organizations like Google and Toyota illustrate the successful integration of modern management theories with innovative communication practices.

Let’s examine the evolution of management theories in the context of business communication through the lens of their impact on modern business processes and communication strategies. Below are the key aspects of management theories that remain relevant for contemporary business communication:


*Fig. 1. The key aspects of management theories that remain relevant for contemporary business communication now days*
**Repared by author*

Fig. 1 represents the evolution of management theories that has profoundly influenced the development of business communication, shaping its principles and practices in ways that remain highly relevant in the contemporary business environment. As an economist examining this evolution, it becomes evident that the interplay between management theories and communication strategies has been pivotal in addressing the complexities of modern organizational dynamics. Each theoretical framework has contributed unique insights, many of which continue to inform effective business communication today.

Classical management theory, pioneered by figures such as Frederick Taylor [26] and Henri Fayol [10], laid the groundwork for structured and hierarchical communication. The emphasis on clarity, precision, and efficiency in conveying instructions remains a cornerstone of business communication. In today's fast-paced and competitive landscape, the need for clear, goal-oriented communication is paramount. Organizations must ensure that messages are delivered in a manner that minimizes ambiguity and maximizes productivity, reflecting the enduring legacy of classical principles.

The human relations theory, championed by Elton Mayo [19], shifted the focus toward the interpersonal aspects of communication. Mayo's work [19] underscored the importance of informal relationships and the role of emotional intelligence in fostering a collaborative work environment. In the modern context, this translates into an emphasis on corporate culture, team-building, and the use of informal communication channels such as social networks and instant messaging platforms. Leaders are increasingly expected to demonstrate empathy, active listening, and the ability to connect with employees on a personal level, highlighting the lasting impact of human relations theory.

The systems approach to management introduced a holistic perspective, viewing organizations as interconnected systems where communication serves as the vital link between components. This theory underscores the importance of integrating communication flows across departments, teams, and external partners. In an era defined by technological advancements, the systems approach has gained renewed relevance. Tools such as CRM systems and collaboration platforms facilitate seamless communication, ensuring that information is shared efficiently and that organizational goals are aligned.

Situational leadership theory, developed by Paul Hersey and Kenneth Blanchard, emphasizes the need for adaptability in communication. Leaders must tailor their communication styles to suit specific contexts, whether navigating a crisis, driving innovation, or managing routine tasks. This flexibility is particularly crucial in today's diverse and dynamic business environment, where a one-size-fits-all approach to communication is often ineffective. The ability to adjust one's tone, medium, and message based on the situation reflects the practical application of situational leadership principles.

Transformational leadership theory, articulated by James MacGregor Burns, highlights the role of communication in inspiring and motivating teams. Transformational leaders use communication as a tool to articulate a compelling vision, foster trust, and encourage innovation. In an age where change is constant, the ability to communicate a clear and inspiring vision is indispensable. Leaders who can effectively convey their ideas and rally their teams around shared goals are better positioned to navigate the challenges of the modern business landscape.

Knowledge management theory has further enriched the field of business communication by emphasizing the importance of knowledge sharing and collaboration. In today's knowledge-driven economy, organizations must create platforms and systems that facilitate the exchange of information. This includes leveraging technology to develop internal databases, conduct webinars, and implement training programs. Effective communication in this context not only enhances operational efficiency but also drives innovation by encouraging the free flow of ideas.

Finally, stakeholder theory has brought attention to the broader implications of business communication. Organizations must engage with a diverse range of stakeholders, including employees, customers, investors, and the public. Transparent and open communication is essential for building trust and maintaining positive relationships. Additionally, the growing emphasis on corporate social responsibility (CSR) has made it imperative for businesses to communicate their social and environmental initiatives effectively. This not only enhances their reputation but also aligns with the expectations of socially conscious stakeholders.

In conclusion, the evolution of management theories has left an indelible mark on the practice of business communication. From the structured clarity of classical theory to the adaptive flexibility

of situational leadership, each framework has contributed valuable insights that remain relevant in today's complex and interconnected world. As organizations continue to navigate the challenges of the digital age, the integration of these theoretical principles into communication strategies will be essential for achieving sustained success. The ability to communicate effectively, empathetically, and strategically will remain a critical competency for leaders and organizations alike.

Modern business communication integrates elements of various management theories, adapting them to the challenges of the digital era. The most prominent aspects that remain relevant include: clarity and structure in communication; emphasis on the human factor and emotional intelligence; use of technology to integrate communication flows; flexibility and adaptability in different situations; transparency and openness in stakeholder relationships.

**Discussion.** The study of management theories has long been intertwined with the development of communication strategies within organizations. The effectiveness of managerial decisions is largely dependent on how well information is transmitted, received, and interpreted across hierarchical levels. Over the past century, the evolution of management thought has introduced new communication paradigms, reflecting technological advancements, globalization, and cultural diversity. This paper investigates how management theories have evolved with regard to business communication, assessing their implications for contemporary business environments. The findings reveal a clear progression in the relationship between management theories and business communication, highlighting the need for adaptive, inclusive, and technology-driven strategies that align with modern organizational challenges.

Classical management theories, such as Taylor's Scientific Management [26] and Fayol's Administrative Theory [10], emphasized hierarchical structures and formal communication channels. While these theories laid the groundwork for structured communication, their rigidity often limited employee autonomy and creativity. However, recent studies have revisited these theories in the context of digital transformation. For instance, Smith and Johnson [23] demonstrated how Taylor's principles of efficiency [26] can be applied to remote work environments, emphasizing the need for clear, structured communication channels. Similarly, García-Sánchez et al. [7] explored the relevance of Fayol's hierarchical communication model [10] in multinational corporations, noting its limitations in fostering cross-cultural collaboration. These findings suggest that while classical theories provide a foundational understanding, they must be adapted to address the complexities of modern organizations.

The Human Relations Movement, pioneered by Elton Mayo [19] and Chester Barnard [1], shifted the focus to interpersonal relationships and informal communication networks. This people-centric approach remains highly relevant in contemporary business communication. Recent research has highlighted the role of emotional intelligence and empathy in managerial communication. For example, Lee et al. [14] found that leaders who adopt a people-centric communication style are more effective in motivating teams and reducing turnover. Additionally, Brown and Green [2] emphasized the importance of informal communication networks in promoting innovation, particularly in tech startups. These studies underscore the enduring value of human-centric approaches in fostering collaboration and engagement.

Systems Theory has gained renewed attention in the context of globalized and interconnected organizations. Recent studies have examined how communication flows across organizational boundaries, particularly in supply chain management and virtual teams. Zhang et al. [29] investigated the role of integrated communication systems in enhancing supply chain resilience, highlighting the importance of real-time information sharing. Similarly, Müller and Schmidt [20] explored the challenges of managing communication in virtual teams, proposing a systems-based approach to improve coordination and trust. These findings suggest that Systems Theory provides a valuable framework for understanding and optimizing communication in complex organizational environments.

Contingency Theory has been widely applied to understand the dynamic nature of business communication in diverse organizational contexts. Recent research has focused on the role of adaptive communication strategies in responding to external disruptions, such as the COVID-19 pandemic. Nguyen et al. [21] analyzed how organizations adapted their communication strategies during the pandemic, emphasizing the need for flexibility and empathy. Another study by Patel and Carter [22] highlighted the importance of context-specific communication in multicultural teams, suggesting that managers tailor their approaches to align with cultural norms. These studies demonstrate the practical relevance of Contingency Theory in addressing the unique challenges of modern business environments.

The advent of digital technologies has revolutionized business communication, prompting a reevaluation of traditional management theories. Recent studies have explored the impact of social media, artificial intelligence, and virtual reality on organizational communication. Leonardi and Treem [17, 27] examined how enterprise social media platforms facilitate knowledge sharing and collaboration, noting their potential to bridge hierarchical gaps. Similarly, Wang et al. [28] investigated the use of AI-powered chatbots in customer service, highlighting their ability to enhance efficiency while posing challenges related to human-AI interaction. These findings underscore the transformative potential of digital technologies in reshaping communication practices.

Recent research has identified several emerging trends in the intersection of management theories and business communication. These include the growing importance of sustainability communication, the role of storytelling in leadership, and the integration of neuroscience insights into communication strategies. Jones et al. [9] explored how sustainability narratives influence stakeholder engagement, suggesting that managers adopt a values-based communication approach. Additionally, Kim and Park [13] highlighted the potential of neuroscience to enhance understanding of communication dynamics, particularly in high-stress environments. These trends point to the need for interdisciplinary approaches in addressing the challenges of modern business communication.

The evolution of management theories has profoundly influenced the development of business communication, shaping its principles and practices in ways that remain highly relevant in the contemporary business environment. From the structured clarity of classical theories to the adaptive flexibility of modern paradigms, each framework has contributed valuable insights that continue to inform effective communication strategies. As organizations navigate the challenges of the digital age, the integration of these theoretical principles into communication practices will be essential for achieving sustained success. Future research should continue to explore the role of emerging technologies and interdisciplinary insights in further enhancing organizational communication.

The findings indicate that communication has shifted from a rigid, hierarchical model to a more dynamic, technology-enabled framework. While classical management theories prioritized control and formal channels, contemporary perspectives emphasize collaboration, adaptability, and digital integration. Challenges such as data security, misinformation, and communication overload require managerial attention in the digital era. Future research should explore ethical considerations and the impact of AI on managerial decision-making.

The results underscore the importance of aligning communication strategies with management theories. Classical theories, while effective in their time, are often inadequate for today’s dynamic business environments. Modern theories offer a more holistic approach, emphasizing adaptability and inclusivity.

The integration of digital tools has revolutionized business communication, enabling organizations to overcome geographical and temporal barriers. However, challenges such as information overload and privacy concerns must be addressed to fully leverage these technologies.

**Conclusions.** This study underscores the integral role of communication in the evolution of management theories. The transition from hierarchical, command-driven models to interactive,

technology-enhanced frameworks reflects broader socio-economic and technological transformations. Future managerial success will depend on the ability to integrate AI-driven communication tools while maintaining ethical and transparent interactions.

This study highlights the scientific novelty of integrating management theories with business communication practices. The findings have significant socio-economic implications, offering a framework for enhancing organizational effectiveness. Future research should explore the role of emerging technologies, such as artificial intelligence and blockchain, in shaping communication strategies.

The study of the evolution of management theories in the context of business communication has revealed a dynamic and transformative journey, reflecting the changing needs and complexities of organizations over time. From the rigid, hierarchical structures of classical management theories to the adaptive, technology-driven frameworks of modern paradigms, the interplay between management thought and communication practices has been pivotal in shaping organizational effectiveness. This research underscores the enduring relevance of foundational theories while highlighting the necessity of adapting them to contemporary challenges.

Key Findings:

- Classical Management Theories: The principles of Scientific Management and Administrative Theory laid the groundwork for structured and efficient communication. However, their rigidity often limited employee autonomy and creativity. Recent adaptations, such as applying Taylor's principles [26] to remote work environments, demonstrate their continued relevance but also highlight the need for flexibility in modern contexts.
- Human Relations Movement: The shift toward human-centric approaches, emphasizing emotional intelligence and informal communication networks, has proven essential in fostering employee engagement and collaboration. Leaders who prioritize empathy and interpersonal relationships are better equipped to motivate teams and drive innovation.
- Systems and Contingency Theories: These frameworks have introduced a more holistic and adaptable understanding of communication. Systems Theory emphasizes the interconnectedness of organizational components, while Contingency Theory underscores the importance of tailoring communication strategies to specific contexts. Both approaches are particularly relevant in today's globalized and digitally connected world.
- Digital Transformation: The advent of digital technologies has revolutionized business communication, enabling real-time interactions, global collaboration, and data-driven decision-making. However, challenges such as information overload, privacy concerns, and the ethical use of AI must be addressed to fully leverage these advancements.
- Emerging Trends: Sustainability communication, storytelling in leadership, and the integration of neuroscience insights represent the future of business communication. These trends highlight the need for interdisciplinary approaches and values-based strategies to address the evolving expectations of stakeholders.

The findings of this study have significant implications for organizational leaders and managers implications for practice:

- Adaptability: Modern communication strategies must be flexible and responsive to changing organizational and environmental contexts.
- Inclusivity: Emphasizing empathy, emotional intelligence, and cultural sensitivity is crucial for fostering collaboration in diverse teams.
- Technology Integration: Leveraging digital tools can enhance efficiency and innovation, but organizations must also address the associated challenges, such as data security and ethical considerations.
- Sustainability and Values: Communicating organizational values and sustainability initiatives is essential for building trust and maintaining positive stakeholder relationships.

While this study provides a comprehensive analysis of the evolution of management theories and their impact on business communication, several areas warrant further exploration: the ethical implications of AI and automation in managerial decision-making; the role of neuroscience in understanding and improving communication dynamics; the long-term impact of sustainability narratives on organizational performance and stakeholder engagement; the development of frameworks for managing communication in hybrid and fully remote work environments.

The evolution of management theories has profoundly influenced the principles and practices of business communication, shaping them into a critical competency for organizational success. From the structured clarity of classical theories to the adaptive flexibility of modern paradigms, each framework has contributed valuable insights that remain relevant in today's complex and interconnected world. As organizations continue to navigate the challenges of the digital age, the integration of these theoretical principles into communication strategies will be essential for achieving sustained success. The ability to communicate effectively, empathetically, and strategically will remain a cornerstone of effective leadership and organizational excellence.

This research not only contributes to the academic understanding of management and communication but also provides practical guidance for leaders seeking to optimize their communication practices in an ever-evolving business landscape. Future studies should build on these findings to further explore the intersection of management theories, emerging technologies, and interdisciplinary insights, ensuring that organizations remain agile and resilient in the face of new challenges.

**References**

1. Barnard, C. I. (1938). The functions of the *executive. Harvard University Press*. Retrieved from: https://archive.org/details/functionsofexec00barn
2. Brown, A., & Green, T. (2022). Informal communication networks and innovation in tech startups. *Journal of Management*, 48(3), 567-589.
3. Brynjolfsson, E., & McAfee, A. (2014). The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. *W.W. Norton & Company*. Retrieved from: https://archive.org/details/secondmachineage0000bryn
4. Davenport, T. H. (2020). The AI Advantage: How to Put the Artificial Intelligence Revolution to Work. *MIT Press*. https://doi.org/10.7551/mitpress/11781.001.0001
5. Drucker, P. (1999). Management Challenges for the 21st Century. HarperBusiness. https://doi.org/10.4324/9780080942384
6. Fiedler, F. E. (1967). A theory of leadership effectiveness. *McGraw-Hill*. Retrieved from: https://archive.org/details/theoryofleadersh00fied
7. García-Sánchez, E., Rodríguez-Domínguez, L., & Gallego-Álvarez, I. (2021). *Hierarchical communication in multinational corporations: A Fayolian perspective. Journal of Organizational Change Management*, 34(5), 789-805.
8. Goleman, D. (2006). Emotional Intelligence: Why It Can Matter More Than IQ. *Bantam*. Retrieved from: https://openlibrary.org/books/OL784532M/Emotional_intelligence
9. Jones, P., Comfort, D., & Hillier, D. (2022). Sustainability narratives and stakeholder engagement. *Business Strategy and the Environment*, 31(4), 1234-1246. https://doi.org/10.1002/bse.3124
10. Fayol, H. (1949). General and industrial management. Pitman. Retrieved from: https://archive.org/details/generalindustria0000henr
11. Hofstede, G. (2010). Cultures and Organizations: Software of the Mind. *McGraw-Hill*.
12. Katz, D., & Kahn, R. L. (1966). The social psychology of organizations. *Wiley*.
13. Kim, S., & Park, J. (2023). Neuroscience and communication dynamics in high-stress environments. *Academy of Management Learning & Education*, 22(1), 45-67.
14. Lee, Y., Kim, H., & Park, S. (2019). Emotional intelligence and leadership communication. *Academy of Management Journal*, 62(4), 1123-1145.
15. Lawrence, P. R., & Lorsch, J. W. (1967). Organization and Environment: Managing Differentiation and Integration. *Harvard Business School Press*.
16. Leonardi, P. M., Huysman, M., & Steinfield, C. (2013). Enterprise social media: Definition, history, and prospects for the study of social technologies in organizations. *Journal of Computer-Mediated Communication*, 19(1), 1-19. https://doi.org/10.1111/jcc4.12029
17. Leonardi, P. M., & Treem, J. W. (2020). Knowledge sharing through enterprise social media. *Administrative Science Quarterly*, 65(2), 345-385.
18. McGregor, D. (1960). The Human Side of Enterprise. *McGraw-Hi*ll.
19. Mayo, E. (1933). The human problems of an industrial civilization. *Macmillan*.
20. Müller, R., & Schmidt, S. (2020). Communication in virtual teams: A systems-based approach. *Journal of Management Studies*, 57(5), 789-812. https://doi.org/10.1111/joms.12567
21. Nguyen, T., Nguyen, H., & Tran, T. (2021). Adaptive communication strategies during COVID-19. *Public Relations Review*, 47(3), 102056. https://doi.org/10.1016/j.pubrev.2021.102056

22. Patel, R., & Carter, M. (2022). Context-specific communication in multicultural teams. *Journal of Applied Behavioral Science*, 58(2), 234-256.
23. Smith, J., & Johnson, E. (2020). Scientific Management in the digital age. *Journal of Business Research*, 115, 45-56.
24. Suntsova, O., Husiatynska, A., & Husiatynskiy, M. (2025). Effective communication in business process management: *A methodological framework. Scientific monograph*. Irpin, Ukraine: STU, New-York,USA:U-Sun, 2025. 304 p. https://doi.org/10.5281/zenodo.15335757
25. Suntsova O.O. Financial Technologies as a Component of the Digital Economy: Trends in the Realities of the COVID-19 Pandemic *Economic Bulletin. Series: finance, accounting, taxation*. Issue 7. 2021. P.161-175.
26. Taylor, F. W. (1911). The principles of scientific management. *Harper & Brothers*.
27. Treem, J. W., & Leonardi, P. M. (2012). Social media use in organizations: Exploring the affordances of visibility, editability, persistence, and association. *Annals of the International Communication Association*, 36(1), 143-189.
28. Wang, Y., Zhang, X., & Li, J. (2023). AI-powered chatbots in customer service. *Journal of Business Research*, 145, 123-135.
29. Zhang, L., Chen, Y., & Wang, H. (2021). Integrated communication systems in supply chain resilience. *International Journal of Production Economics*, 231, 108234. https://doi.org/10.1016/j.ijpe.2021.108234

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**Еволюція теорій управління в контексті ділового спілкування**

***Анотація.*** У цій статті досліджується еволюція теорій управління та їх вплив на ділову комунікацію, зосереджуючись на переході від жорстких, ієрархічних систем до адаптивних моделей, заснованих на технологіях. Об'єктом дослідження є динамічний взаємозв'язок між управлінськими парадигмами та комунікаційними стратегіями в організаціях.

**Постановка задачі.** Незважаючи на теорію управління та організаційні комунікації добре вивчені, інтеграція класичних принципів з вимогами сучасного цифрового, глобалізованого бізнес-середовища залишається недостатньо вивченою.

**Невирішені аспекти проблеми.** Обмежені дослідження стосуються адаптації традиційних моделей до цифрового контексту, вбудовування емоційного інтелекту в технологічну комунікацію, а також впливу наративів про сталий розвиток на відносини із зацікавленими сторонами.

**Мета статті.** Метою дослідження є простеження прогресу теорій управління по відношенню до ділового спілкування та пропозиція шляхів інтеграції основоположних принципів із сучасними інноваціями.

**Виклад основного матеріалу.** Використовуючи якісний підхід, дослідження синтезує рецензовану літературу, корпоративні тематичні дослідження та галузеві звіти. Вона простежує історичний шлях від наукового менеджменту та адміністративної теорії до руху людських відносин, теорії систем та теорії непередбачених обставин, кульмінацією якого є акцент цифрової ери на інструментах на основі штучного інтелекту, віртуальній співпраці та міжкультурній компетентності. Результати показують, що хоча ясність і структура залишаються важливими, адаптивність, емпатія та технологічна інтеграція зараз мають вирішальне значення для ефективної комунікації.

**Висновки.** Результати показують, що комунікаційні стратегії повинні розвиватися разом з парадигмами управління для забезпечення організаційної стійкості. Дослідження пропонує основу для лідерів для посилення співпраці, прийняття рішень та довіри зацікавлених сторін. Майбутні дослідження мають бути зосереджені на етиці штучного інтелекту, комунікації на основі нейронаук та залученні, орієнтованому на сталий розвиток.

***Ключові слова:*** *теорії управління, бізнес-комунікація, цифрова трансформація, комунікація сталого розвитку, адаптивні стратегії, організаційна ефективність.*

Класифікація JEL: M10, M12, M14, M15, M54, L22, L23

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**Список літератури**

1. Barnard C. I. The functions of the executive. Harvard University Press, 1938. URL: https://archive.org/details/functionsofexec00barn.
2. Brown A., Green T. Informal communication networks and innovation in tech startups. *Journal of Management*. 2022. Vol. 48, No. 3. P. 567–589.
3. Brynjolfsson E., McAfee A. The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. W.W. Norton & Company, 2014. URL: https://archive.org/details/secondmachineage0000bryn.
4. Davenport T. H. The AI Advantage: How to Put the Artificial Intelligence Revolution to Work. MIT Press, 2020. DOI: https://doi.org/10.7551/mitpress/11781.001.0001.
5. Drucker P. Management Challenges for the 21st Century. HarperBusiness, 1999. DOI: https://doi.org/10.4324/9780080942384.
6. Fiedler F. E. A theory of leadership effectiveness. McGraw-Hill, 1967. URL: https://archive.org/details/theoryofleadersh00fied.
7. García-Sánchez E., Rodríguez-Domínguez L., Gallego-Álvarez I. Hierarchical communication in multinational corporations: A Fayolian perspective. *Journal of Organizational Change Management*. 2021. Vol. 34, No. 5. P. 789–805.
8. Goleman D. Emotional Intelligence: Why It Can Matter More Than IQ. Bantam, 2006. URL: https://openlibrary.org/books/OL784532M/Emotional_intelligence.
9. Jones P., Comfort D., Hillier D. Sustainability narratives and stakeholder engagement. *Business Strategy and the Environment*. 2022. Vol. 31, No. 4. P. 1234–1246. DOI: https://doi.org/10.1002/bse.3124.
10. Fayol H. General and industrial management. Pitman, 1949. URL: https://archive.org/details/generalindustria0000henr.
11. Hofstede G. Cultures and Organizations: Software of the Mind. McGraw-Hill, 2010.
12. Katz D., Kahn R. L. The social psychology of organizations. Wiley, 1966.

13. Kim S., Park J. Neuroscience and communication dynamics in high-stress environments. *Academy of Management Learning & Education*. 2023. Vol. 22, No. 1. P. 45–67.
14. Lee Y., Kim H., Park S. Emotional intelligence and leadership communication. *Academy of Management Journal*. 2019. Vol. 62, No. 4. P. 1123–1145.
15. Lawrence P. R., Lorsch J. W. Organization and Environment: Managing Differentiation and Integration. Harvard Business School Press, 1967.
16. Leonardi P. M., Huysman M., Steinfield C. Enterprise social media: Definition, history, and prospects for the study of social technologies in organizations. *Journal of Computer-Mediated Communication*. 2013. Vol. 19, No. 1. P. 1–19. DOI: https://doi.org/10.1111/jcc4.12029.
17. Leonardi P. M., Treem J. W. Knowledge sharing through enterprise social media. *Administrative Science Quarterly*. 2020. Vol. 65, No. 2. P. 345–385.
18. McGregor D. The Human Side of Enterprise. McGraw-Hill, 1960.
19. Mayo E. The human problems of an industrial civilization. Macmillan, 1933.
20. Müller R., Schmidt S. Communication in virtual teams: A systems-based approach. *Journal of Management Studies*. 2020. Vol. 57, No. 5. P. 789–812. DOI: https://doi.org/10.1111/joms.12567.
21. Nguyen T., Nguyen H., Tran T. Adaptive communication strategies during COVID-19. *Public Relations Review*. 2021. Vol. 47, No. 3. P. 102056. DOI: https://doi.org/10.1016/j.pubrev.2021.102056.
22. Patel R., Carter M. Context-specific communication in multicultural teams. *Journal of Applied Behavioral Science*. 2022. Vol. 58, No. 2. P. 234–256.
23. Smith J., Johnson E. Scientific Management in the digital age. *Journal of Business Research*. 2020. Vol. 115. P. 45–56.
24. Suntsova O., Husiatynska A., Husiatynskiy M. Effective communication in business process management: A methodological framework. Scientific monograph. Irpin, Ukraine: STU; New-York, USA: U-Sun, 2025. 304 p. DOI: https://doi.org/10.5281/zenodo.15335757.
25. Suntsova O. O. Financial Technologies as a Component of the Digital Economy: Trends in the Realities of the COVID-19 Pandemic. *Economic Bulletin. Series: finance, accounting, taxation*. 2021. Issue 7. P. 161–175.
26. Taylor F. W. The principles of scientific management. Harper & Brothers, 1911.
27. Treem J. W., Leonardi P. M. Social media use in organizations: Exploring the affordances of visibility, editability, persistence, and association. *Annals of the International Communication Association*. 2012. Vol. 36, No. 1. P. 143–189.
28. Wang Y., Zhang X., Li J. AI-powered chatbots in customer service. *Journal of Business Research*. 2023. Vol. 145. P. 123–135.
29. Zhang L., Chen Y., Wang H. Integrated communication systems in supply chain resilience. *International Journal of Production Economics*. 2021. Vol. 231. P. 108234. DOI: https://doi.org/10.1016/j.ijpe.2021.108234.

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