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DIGITALIZATION OF THE BANKING SECTOR OF KAZAKHSTAN: CHALLENGES AND OPPORTUNITIES

In the context of the active digital transformation of the economy, the banking sector of Kazakhstan faces new challenges and opportunities that affect its sustainability and security. This article examines the key aspects of the digitalization of the banking sector, as well as its impact on the economic security and financial stability of credit institutions. The main focus is on the analysis of the impact of digital technologies on the strategic development of banks, risk structure, customer behavior patterns, and competitive environment.

Using the methods of comparative analysis, logical generalization, and systemic and structural approaches, both the international experience of the digitalization of the banking sector and the specifics of the development of digital initiatives in Kazakhstan are analyzed. Particular attention is paid to the practices of implementing digital platforms, mobile banking, artificial intelligence, big data systems, and blockchain technologies.

The study identifies key digital trends driving the transformation of banking and shows how digitalization can drive financial inclusion, optimize internal processes, and improve customer satisfaction. At the same time, it highlights the risks associated with digital transformation, including cybersecurity threats, legal and regulatory challenges, and social and ethical issues.

Based on the analysis, recommendations were developed to ensure the sustainability of the banking sector in the context of digitalization, including the need to improve public policy, implement comprehensive risk management systems, and develop human resources. The results obtained are of practical significance and can be used to formulate strategies for the sustainable development of the banking sector in Kazakhstan.

Keywords: bank, banking system, artificial intelligence, commercial bank, digitalization, digital transformation, digital economy

Кілт сөздер: банк, банк жүйесі, жасанды интеллект, коммерциялық банк, цифрландыру, цифрлық трансформация, цифрлық экономика.

Ключевые слова: банк, банковская система, искусственный интеллект, коммерческий банк, цифровизация, цифровая трансформация, цифровая экономика.

JEL classification : G21

Introduction. In the context of rapid technological progress and transformation of consumer behavior, active digitalization of banking services is taking place. This process is accompanied not only by the emergence of new opportunities but also by an increase in vulnerabilities, which necessitates a rethinking of approaches to ensuring the economic security of financial organizations.

The relevance of the topic is due to the need to develop effective risk management strategies and sustainable development of banks in the context of digital transformation. Issues of regulatory control, information security, adaptation of infrastructure, and increasing customer confidence are of particular importance.

The purpose of this study is to identify mechanisms for ensuring the economic security of the banking sector in the context of digitalization, as well as to formulate proposals aimed at reducing risks and increasing the sustainability of financial institutions.

In accordance with the stated goal, the article solves the following tasks:

- 1) analyze modern trends in the digitalization of the banking sector at the global and national levels;
- 2) identify key threats and risks accompanying digital transformation;
- 3) propose measures to improve the efficiency of digitalization, taking into account the sustainability and security of the banking system.

The methodological basis of the study was formed by methods of analysis and generalization of scientific literature, statistical analysis of financial stability indicators, as well as a comparative study of domestic and foreign experience in implementing digital technologies in the banking sector. The methods used provide scientific validity of the conclusions and allow us to offer practical recommendations for further improvement of digital processes in the banking system of Kazakhstan.

The hypothesis of the study suggests that the digitalization of the banking sector, subject to effective risk management and an appropriate regulatory framework, contributes to strengthening economic security and increasing the sustainability of the banking system of Kazakhstan.

The methodological basis of the study includes:

- analysis and generalization of scientific literature and cases of implementation of digital technologies in the banking sector;
- statistical analysis of financial stability indicators;
- a comparative study of international and domestic experience in the digitalization of the banking sector."

The study will develop recommendations for optimizing digitalization processes in banks, aimed at increasing their resilience to constant threats and improving customer experience. The results may be useful both for commercial bank executives making strategic decisions and for specialists involved in the implementation of digital products and risk management.

Literature review. The banking sector's digitalization is key to the financial industry's global and national transformation. This area is actively studied in global practice, but approaches and results vary depending on the country's conditions and the degree of development of the digital infrastructure.

One of the significant contributions to the international theory of digitalization is the work of S. Aidi and M. Roger [1], which argues that the introduction of digital technologies in the banking sector improves customer experience and increases operational efficiency. This opinion reflects the general trend on the global level, but for Kazakhstan, this topic requires a more detailed study, taking into account the specifics of the national economy and banking system, especially in the context of insufficient digital infrastructure. However, this approach, in our opinion, does not sufficiently take into account the specifics of developing countries, where infrastructure limitations can significantly slow down this process. Research by Rhodes and Schwartz [2] emphasizes that changes in banks' business models also require adaptation of risk management strategies. In the context of Kazakhstan, this problem is particularly relevant, since many banks in the country face difficulties in implementing modern technologies and the need for appropriate regulation to ensure the security of operations.

The works of Klaus Schwab [3], in turn, draw attention to the need to integrate cybersecurity into digital transformation processes. However, these studies, although emphasizing the importance of data protection, do not offer specific solutions that could be applied in practice in the banking sector of Kazakhstan, where cyber threats and data protection issues remain at a low level due to the lack of adequate infrastructure and regulations.

Among Kazakhstani studies, the works of Bekmukhanova and Zhakupova [4] stand out, focusing on the role of government initiatives in supporting the digitalization of the banking sector. However, these studies mainly focus on theoretical aspects and do not sufficiently consider the practical effectiveness of these initiatives, which limits their practical significance for banks seeking to implement innovative digital solutions.

A study by Zhanar Seitkhanova [5] highlights the importance of cooperation between banks and IT companies in creating digital platforms, which is a topical issue for the development of the Kazakh banking system. However, as in other studies, insufficient attention is paid to the risks associated with such partnerships, including issues of data security and legal liability of the parties.

The work of A. Aubakirov [6] examines local banking in Kazakhstan, which is directly related to increasing financial accessibility and inclusiveness. However, this analysis does not take into account possible problems of implementing local digital solutions and their integration into the general banking system, which is important for assessing the sustainability of these initiatives.

I. Makhmutov [7] focuses on cyber threats and data security, which are becoming an integral part of

the digitizing process. However, the study does not offer specific recommendations for adapting regulations and regulatory mechanisms, which complicates the practical application of the proposed approaches.

Thus, despite the significant contribution of existing studies, it is important to note that most of them do not provide sufficient information on the specifics of the digitalization of the banking sector in Kazakhstan, especially in the context of its sustainability and security. In particular, little attention is paid to the creation of a regulatory framework and the real risks that banks face in the process of digital transformation. In this study, we will seek to fill these gaps by offering recommendations for ensuring the economic security of banks in the context of digitalization and analyzing the effectiveness of measures already taken at the level of the state and banking institutions.

Main part. The transition to a digital economy has a transformative effect on the banking sector, which causes active discussions in academic and business circles. One of the central issues is the role of information technology in changing the architecture of the banking business. Researchers [8] draw attention to the growing dependence of banks on external IT companies, which create platforms and become the main operators of economic value, while the banks themselves are gradually losing their functions as direct producers of the digital financial products. This trend makes the banking sector vulnerable and requires a revision of traditional models of service management and building customer relationships.

Other researchers [9] focus on the technological gap between Kazakhstan and leading countries in the field of digitalization. This gap is especially critical in the context of the banking system, where the implementation of digital solutions requires not only technological but also institutional adaptation.

Analysis of current trends confirms the active digitalization of the banking sector of Kazakhstan. Thus, from 2019 to 2023, the number of active online banking users increased by 4.6 times, which confirms the high level of demand for digital financial services (see Figure 1). The growth is explained not only by the improvement of the digital infrastructure but also by the targeted state policy to support non-cash payments and fintech services.

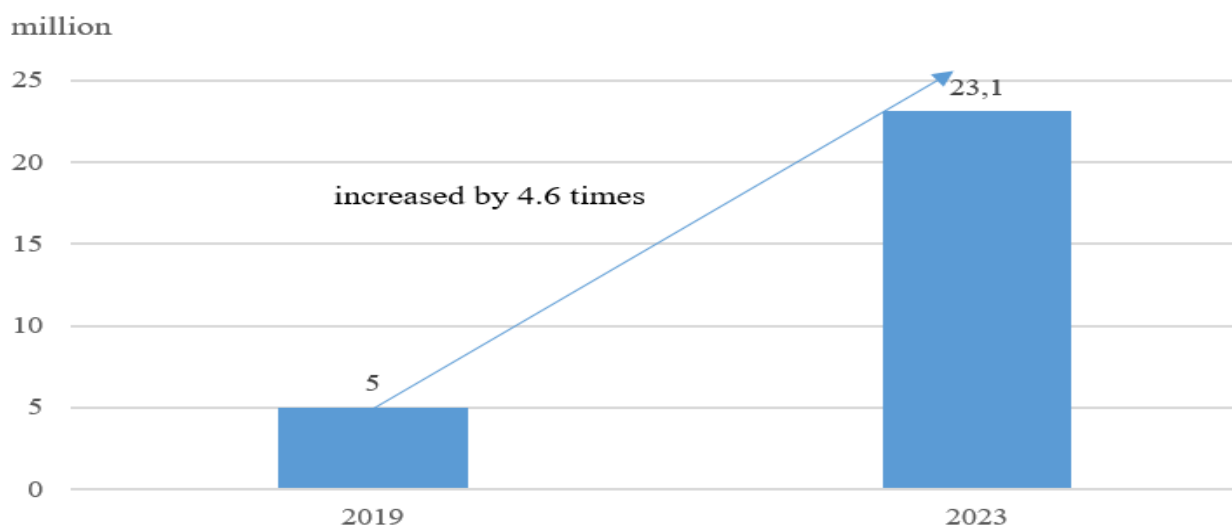
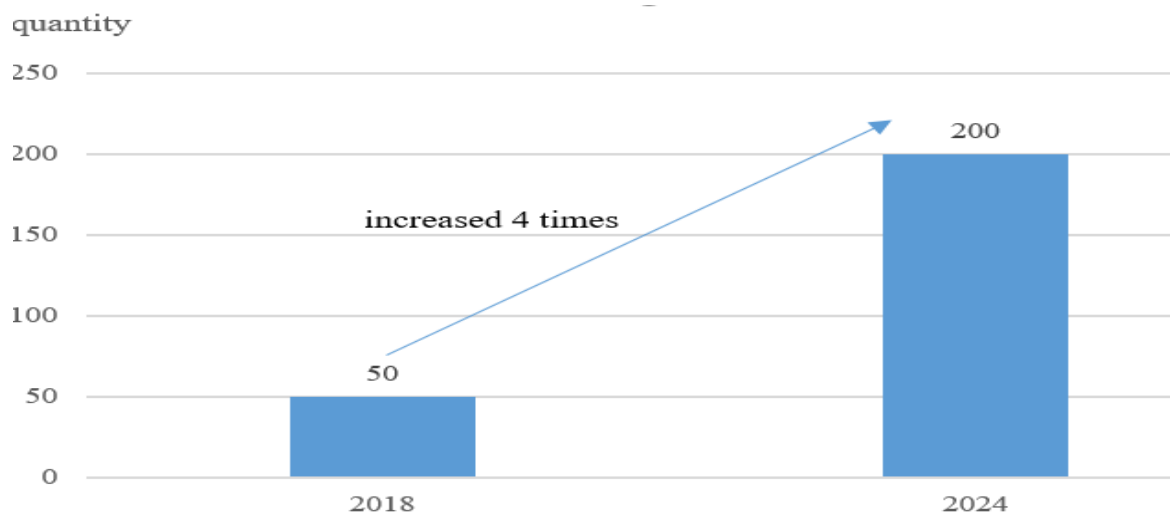


Figure –1. **Number of active online banking users, million.**

** compiled by the authors based on their own research.*

In parallel, the fintech market is rapidly developing in Kazakhstan: the number of startups has increased from ~50 in 2018 to more than 200 in 2024, while fintech has become a leader in attracting venture capital and is actively integrating into the banking ecosystem through partnership models (see Figure 2).

Figure – 2. **Number of fintech startups in Kazakhstan**

* compiled by the authors based on their own research.

Taking into account demographic factors (average age is 30 years old, 62% are aged 15 to 64 years old), Kazakhstan has a high potential for digital consumption. According to PwC estimates, electronic means of payment will account for 12.6% of total retail sales in 2023, and this figure has a steady upward trend.

However, digitalization is accompanied by several challenges: limited access to intellectual resources, dependence on external outsourcing, and the outflow of IT personnel negatively affect the sustainability of the technological development of banks [5, 7].

The peculiarity of the Kazakhstani digitalization model is the active role of the state. Unlike market economies, where the private sector leads in innovation, in Kazakhstan it is state regulators that set the strategic vector of digital transformation. This reduces the risks of systemic instability but slows down adaptation to global technological trends.

Digital transformation covers key initiatives in the banking sector: increasing operational efficiency, improving customer experience, and expanding the availability of financial services [9]. At the same time, about 70% of risks arising in the digital environment are related to the storage and transmission of data. As a result, 22% of banks worldwide are already spending more than a quarter of their budget on the digitalization of risk management systems—this is an important indicator of the prioritization of cybersecurity in the financial sector.

International experience (e.g., Malaysia, Thailand, Indonesia, Philippines, Vietnam) demonstrates the effectiveness of operational risk diversification as a competitiveness factor. Thus, Indonesia and Thailand have seen a steady increase in profitability and improved risk management. Chinese studies also confirm the positive effect of diversification—growth in market share, increase in non-interest income, and net interest margin.

This allows us to draw a practical conclusion: diversification of assets and income, combined with digital solutions, strengthens the resilience of banks in a volatile environment.

Digitalization is driving the use of new technologies such as blockchain, cryptocurrencies, crowdfunding, and hybrid service models, which requires banks to adapt their business models. An example of a legislative initiative in this direction is the PSD 2 directive, which is aimed at developing electronic payments and open banking.

However, the pace of digitalization varies across countries, from 89–93% of online banking users in Scandinavia to less than 7% in Eastern European countries. Kazakhstan has seen significant growth in mobile and contactless payments, P2P services, and digital mortgages, but barriers remain related to the digital illiteracy of the older generation and limited user adoption [10, 11].

Research by Banker, Chen, Liu, and Ou (2009) shows that online services do not always lead to sales growth, despite their cost-effectiveness. This highlights the importance of a balanced approach—maintaining offline channels as a supporting element of the strategy [12].

In the context of Kazakhstan, the key areas of digitalization are cybersecurity, mobile and digital payments, artificial intelligence (AI), digital mortgages, and improving user experience. These priorities

are in line with global trends and can be implemented taking into account local specifics through public-private partnerships and international cooperation.

In conclusion, successful digital transformation of banks requires a systematic approach: risk diversification, sustainable IT infrastructure, personnel readiness, and strategic planning. Only if these conditions are met simultaneously is it possible to move from formal digitalization to a real improvement in the quality of financial services and the sustainability of the banking system in Kazakhstan.

Conclusion. Digital transformation of the banking sector is an integral part of the current stage of economic development and requires a strategic approach from all participants in the financial system. The study indicated that the introduction of digital technologies has a complex impact on the structure, processes, and business models of banks, creating both new opportunities to improve the efficiency and availability of services and serious challenges in the fields of cybersecurity, regulation, and adaptation of the client base.

The specifics of the digitalization of the banking sector in Kazakhstan demonstrate the importance of state participation, regulatory support, and the development of local IT initiatives. Kazakhstan's experience confirms that the sustainability of digital transformation largely depends on the ability of banks to adapt to external technological changes, invest in digital infrastructure, and take into account the needs of different age and social groups of clients.

The practical significance of the results of this study lies in the formulation of key areas for developing an effective strategy for the digital transformation of banks: the development of cybersecurity, the use of artificial intelligence, the introduction of digital mortgages, and the strengthening of partnerships with fintech companies and international organizations. In the long term, this will increase the competitiveness of banks and ensure the sustainability of the financial system in the context of the global digital economy.

REFERENCES

1. Aidy S., Roger M. Digital Banking Transformation: Improving Customer Experience and Operational Efficiency // *Journal of Banking & Finance*. – 2021. – № 45(3). – P. 123–136.
2. Rhodes D., Schwartz P. Digital transformation in banking: Impact on business models and risk management // *Journal of Financial Innovation*. – 2021. – № 15(2). – P. 125–140.
3. Шваб К. Четвертая промышленная революция. – М.: Эксмо, 2020. – 208 с.
4. Бекмуханов Н.А., Жакупов К.Т. Цифровизация финансового сектора Казахстана: проблемы и перспективы // *Вестник Финансового университета при Правительстве Российской Федерации*. – 2022. – №24(3). – С. 78–85.
5. Сейтханова Ж.А. Роль ИТ-компаний в цифровизации банковского сектора Казахстана // *Журнал экономики и финансов*. – 2023. – №18(4). – С. 112–120.
6. Аубакирова А. Мобильный банкинг в Казахстане: перспективы и проблемы цифровизации финансового сектора // *Экономика и управление*. – 2022. – №12(2). – С. 88–95.
7. Махмутов И. Цифровизация финансового сектора Казахстана: риски и безопасность // *Банковское дело*. – 2020. – №23(4). – С. 45–52.
8. Vives X. The Impact of Digitalization on the Banking Sector: Opportunities and Challenges // *International Journal of Banking*. – 2020. – № 37(2). – P. 203–218.
9. Анохина А.А., Донская Е.Н. Цифровизация банковских услуг // *Актуальные проблемы современности: наука и общество*. – 2021. – №2. – С. 30–33.
10. Каленов О.Е. Цифровые экосистемы организаций // *Вестник Российского экономического университета имени Г. В. Плеханова*. – 2022. – №19(1). – С. 139–147. – doi: 10.21686/2413-2829-2022-1-139-147.
11. Neves C., Oliveira T., Santini F., Gutman L. Adoption and use of digital financial services: A meta analysis of barriers and facilitators // *International Journal of Information Management Data Insights*. – 2023. – №3. – doi: 10.1016/j.jjimei.2023.100201.
12. Javaheri D., Fahmideh M., Chizari H., Lalbakhsh P., Hur L. Cybersecurity threats in FinTech: A systematic review // *Expert Systems*. – 2023. – doi: 10.1016/j.eswa.2023.122697.

REFERENCES

1. Aidy S., Roger M. Digital Banking Transformation: Improving Customer Experience and Operational Efficiency // Journal of Banking & Finance. – 2021. – № 45(3). – P. 123–136.
2. Rhodes D., Schwartz P. Digital transformation in banking: Impact on business models and risk management // Journal of Financial Innovation. – 2021. – № 15(2). – P. 125–140.
3. Shvab K. Chetvertaya promyshlennaya revolyutsiya. – M.: Eksmo, 2020. – 208 s [in Russian].
4. Bekmukhanov N., Zhakupov K. Tsifrovizatsiya finansovogo sektora Kazakhstana: problemy i perspektivy // Vestnik Finansovogo universiteta pri Pravitelstve Rossiyskoy Federatsii. – 2022. – № 24(3). – S. 78–85 [in Russian].
5. Seytkhanova Zh. Rol' IT-kompaniy v tsifrovizatsii bankovskogo sektora Kazakhstana // Zhurnal ekonomiki i finansov. – 2023. – № 18(4). – S. 112–120 [in Russian].
6. Aubakirova A. Mobilnyy banking v Kazakhstane: perspektivy i problemy tsifrovizatsii finansovogo sektora // Ekonomika i upravleniye. – 2022. – № 12(2). – S. 88–95 [in Russian].
7. Makhmutov I. Tsifrovizatsiya finansovogo sektora Kazakhstana: riski i bezopasnost // Bankovskoye delo. – 2020. – № 23(4). – S. 45–52 [in Russian].
8. Vives X. The Impact of Digitalization on the Banking Sector: Opportunities and Challenges // International Journal of Banking. – 2020. – № 37(2). – P. 203–218.
9. Anokhina A., Donskaya Ye. Tsifrovizatsiya bankovskikh uslug // Aktualnyye problemy sovremennosti: nauka i obshchestvo. – 2021. – №2. – S. 30–33 [in Russian].
10. Kalenov O. Tsifrovyye ekosistemy organizatsiy // Vestnik Rossiyskogo ekonomicheskogo universiteta imeni G. V. Plekhanova. – 2022. – № 19(1). – S. 139–147. – doi: 10.21686/2413–2829–2022–1–139–147. [in Russian].
11. Neves T., Oliveira F., Santini L. Gutman Adoption and use of digital financial services: A meta analysis of barriers and facilitators//International Journal of Information Management Data Insights, 3 (2023). – doi:10.1016/j.jjime.2023.100201.
12. Javaheri D., Fahmideh M., Chizari H., Lalbakhsh P., Hur L. Cybersecurity threats in FinTech: A systematic Expert Systems. – doi:10.1016/j.eswa.2023.122697.

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ҚАЗАҚСТАНДАҒЫ БАНК СЕКТОРЫН ЦИФРЛАНДЫРУ: ҚИЫНДЫҚТАР МЕН МҮМКІНДІКТЕР

Аңдатпа

Экономиканың белсенді цифрлық трансформациясы жағдайында Қазақстанның банк секторы оның тұрақтылығы мен қауіпсіздігіне әсер ететін жаңа міндеттер мен мүмкіндіктерге тап болып отыр. Бұл мақалада банк секторын цифрландырудың негізгі аспектілері, сондай-ақ оның несиелік ұйымдардың экономикалық қауіпсіздігі мен қаржылық тұрақтылығына әсері қарастырылған. Негізгі назар цифрлық технологиялардың банктердің стратегиялық дамуына, тәуекел құрылымына, клиенттердің мінез-құлық үлгілеріне және бәсекелестік ортаға әсерін талдауға бағытталған.

Салыстырмалы талдау, логикалық жалпылау, жүйелік және құрылымдық тәсілдер әдістерін пайдалана отырып, банк секторын цифрландырудың халықаралық тәжірибесі де, Қазақстандағы цифрлық бастамаларды дамыту ерекшеліктері де талданды. Сандық платформаларды, мобильді банкінгі, жасанды интеллектті, Big Data жүйелерін және блокчейн технологияларын енгізу тәжірибесіне ерекше назар аударылады.

Зерттеу банк ісін түрлендіруге түрткі болатын негізгі цифрлық үрдістерді анықтады және цифрландыру қаржылық инклюзияны, ішкі процестерді оңтайландыруды және клиенттердің қанағаттануын қалай арттыратынын көрсетті. Сонымен бірге, назар цифрлық трансформацияға байланысты тәуекелдерге, соның ішінде киберқауіпсіздікке қауіп-қатерлерге, құқықтық және реттеуші мәселелерге, сондай-ақ әлеуметтік және этикалық аспектілерге аударылады.

Талдау негізінде цифрландыру жағдайында банк секторының тұрақтылығын қамтамасыз ету бойынша ұсыныстар әзірленді, оның ішінде мемлекеттік саясатты жетілдіру, тәуекелдерді басқарудың кешенді жүйелерін енгізу, кадрлық ресурстарды дамыту қажет. Алынған нәтижелердің практикалық маңызы бар және олар Қазақстанның банк секторының тұрақты дамуының стратегияларын қалыптастыру үшін пайдаланылуы мүмкін.

Кулубекова А.Ж., Цапова О.А., Смольянинова С.Ф., Кенжебаева З.С.

ЦИФРОВИЗАЦИЯ БАНКОВСКОГО СЕКТОРА КАЗАХСТАНА: ВЫЗОВЫ И ВОЗМОЖНОСТИ

Аннотация

В условиях активной цифровой трансформации экономики банковский сектор Казахстана сталкивается с новыми вызовами и возможностями, влияющими на его устойчивость и безопасность. В настоящей статье рассмотрены ключевые аспекты цифровизации банковской сферы, а также её воздействие на экономическую безопасность и финансовую устойчивость кредитных организаций. Основное внимание уделено анализу влияния цифровых технологий на стратегическое развитие банков, структуру рисков, клиентские модели поведения и конкурентную среду.

С использованием методов сравнительного анализа, логического обобщения, системного и структурного подходов проанализированы как международный опыт цифровизации банковского сектора, так и особенности развития цифровых инициатив в Казахстане. Особое внимание уделено практикам внедрения цифровых платформ, мобильного банкинга, искусственного интеллекта, систем Big Data и блокчейн-технологий.

В результате проведенного исследования выявлены основные цифровые тренды, определяющие трансформацию банковской деятельности, а также показано, каким образом цифровизация способствует росту финансовой инклюзии, оптимизации внутренних процессов и повышению уровня клиентской удовлетворённости. В то же время акцентируется внимание на рисках, сопровождающих цифровую трансформацию, включая угрозы кибербезопасности, правовые и регуляторные вызовы, а также социальные и этические аспекты.

На основе анализа выработаны рекомендации по обеспечению устойчивости банковского сектора в условиях цифровизации, включая необходимость совершенствования государственной политики, внедрения комплексных систем управления рисками, а также развития кадрового потенциала. Полученные результаты обладают практической значимостью и могут быть использованы для формирования стратегий устойчивого развития банковской сферы в Казахстане.

