

Research Paper

Problems and Prospects of Improving the Banking System and its Impact on the Economy

Viktoriia Myronchuk¹, Alisa Kirizleyeva², Volodymyr Saienko³, Olena Bodnar⁴ and Kyrlyo Muraviov⁵

¹Department of Banking, Finance, and Insurance VERIE WUNU, West Ukrainian National University, Vinnytsia, Ukraine

²Department of Finance, Donetsk National University of Economics and Trade named after Mikhail Tugan-Baranovsky, Kryvyi Rih, Ukraine

³Department of Innovation Management, Academy of Applied Sciences – Academy of Management and Administration in Opole, Poland

⁴Department of Finance, Banking and Insurance, Mykolayiv National Agrarian University, Mykolayiv, Ukraine

⁵Department of Administrative, Financial and Banking Law, Interregional Academy of Personnel Management, Kyiv, Ukraine

*Corresponding author: tvkurus1@ukr.net (ORCID ID: 0000-0003-2736-0017)

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ABSTRACT

The article analyzes management models of banking systems. The influencing factors presented in the analyzed models were analyzed. Research directions have been determined: innovative technologies in the e-banking system and management mechanisms aimed at customer orientation in conditions of high competition and a high degree of commercialization. A projection of trends in the development of banking services in a digital format was made in the system of transactions, payments, deposits in cryptocurrencies, and other banking operations. The trends confirmed the relevance of the development of digital technologies in banking systems. A simulation of banking systems management processes was carried out. In particular, the rates of deposits and loans were calculated by projecting the ratio of bank rate indicators for deposits and loans. Accordingly, the practical use of modeling processes of changes in the bank rate and changes in the pace of customer engagement is proposed. The direct proportional dependence of the rate on the rates of deposits and loans was determined. Such dependence allows for the implementation of management decisions regarding the development of a banking institution or the banking system based on modeling the process of changes associated with changes in the rate and the impact on the growth rates of the number of deposits and loans. In the perspective of further research, the analysis of other factors in the management system of the banking system is defined, in particular, their influence on the profitability of banking institutions and banking systems in the conditions of external challenges and innovative requests.

HIGHLIGHTS

- The article analyzes management models of banking systems. The influencing factors presented in the analyzed models were analyzed. Research directions have been determined: innovative technologies in the e-banking system and management mechanisms aimed at customer orientation in conditions of high competition and a high degree of commercialization.

Keywords: Banking system, national economy, investments, currency markets

The banking system is the basis for the formation of the investment and economic policy of the state. The formation of consumer activity and entrepreneurial development is closely related to the development

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and effective functioning of the banking system. The banking system is directly related to the public administration system formed in the state based on the features and specifics of the public administration system and the state financial policy, transformations are carried out, and there is a direct influence on the peculiarities of the development of the banking system. In turn, the banking system directly influences credit operations, investment processes, and financial markets. The banking system's functioning directly affects the efficiency of investment processes and the development of the commercial sector. The banking system affects the credit and monetary system, determining the emission processes, cash flow movements, the total money supply in the state, and the speed of turnover of funds.

Therefore, the banking system's influence on the development processes of state finances and the economy is decisive, so the research on the banking sector is highly relevant. The banking sector research acquires particular relevance in the conditions of transformational processes of the external environment. New global challenges have significantly changed the architecture of financial systems and the global economy. In quarantine restrictions, the development of e-commerce, and the digital economy, there is a transition from paper funds to virtual payments. The electronic system of finance and e-banking is the basis of forming the economy of a new social order - digital. Recent processes have only accelerated such changes. The beginning of the full-scale military aggression of the Russian Federation against Ukraine caused the emergence of new challenges, including in banking processes: an increase in the number of international electronic payments and transfers, the introduction of sanctions against the financial institutions of the aggressor country, which, in particular, related to its participation in international payment systems, the formation new financial flows for goods and services in connection with changes in trade at the global level. These new challenges determine the authors' attention to the scientific and research analysis of the development of the banking system in the new socio-political and socio-economic conditions.

Therefore, the purpose of the article is to model the processes of building effective processes

of development of the banking system in the conditions of global challenges and transformations. To achieve the goal of the research, the following tasks were performed:

- ♦ an analysis of the impact of the banking system on the national economy was carried out,
- ♦ trends in the development of the banking system are determined,
- ♦ development trends of the banking system were developed and mathematically substantiated,
- ♦ a model of interconnected influences was built.

Literature review

Modern society is undergoing fundamental changes in political, legal, social and organizational, spiritual and moral, and economic aspects (Holovaty, 2015). Banking system development is an essential element of public administration and state financial and credit policy. Determining the impact of the market structure and market conditions on the banking system is relevant. The banking system developing in countries with a market economy has higher efficiency than the banking systems of administrative and management structures. Therefore, market transformations are essential in the system of ensuring the processes of development of banking systems, as well as the processes of state administration (Khan, Saienko and Tolchieva, 2021).

The development of banking systems is an element of the digital economy, so the development processes of e-banking are relevant. E-banking is the basis of the formation of customer orientation and determination of feedback with consumers of banking services in the conditions of modern society. The research of e-banking simulation processes is fascinating. In particular, Kamboj, S., Sharma, M. and Sarmah, B. (2021). In their research, they developed a model of e-banking based on the analysis of four parameters: functional, system, information, and service. By adapting Delon and McLean's models of informational success, proposals were developed to implement the results of sociological research of respondents who were users of electronic e-banking services. The analysis was carried out using a sociological survey and modeling of its results using the method of structural equation modeling (SEM). As a result of the conducted research, it was determined that the analyzed failure parameters

in e-banking systems affect user satisfaction with e-banking. The developed model makes it possible to project failures in the system on the number of users who change the banking institution because of dissatisfaction with its work. Such a model helps to ensure the practical management of electronic banking systems as elements of the marketing policy of banking institutions. Therefore, empirical research and modeling processes allowed the development of practical mechanisms that can improve the efficiency of e-banking management processes.

Customer-oriented management is defined as the basis for the formation of effective banking systems. The possibilities of using artificial intelligence to develop a strategy for modeling the provision of banking services are analyzed. On the one hand, new technologies have a positive effect on consumers and their purchasing behavior since new technologies are aimed at simplifying systems for receiving services (Koval *et al.*, 2021). However, innovations and the need to adapt often cause negative emotions at the stage of their implementation and mastery by clients. In addition, innovative solutions have a more significant number of failures so that they can be negatively perceived by customers in the first stages and create negative situations at work (Latysheva, 2020). Research conducted by Omoge, A.P., Gala, P. and Horkey, A. (2022) identifies the results of quantitative data analysis of a sociological survey on the perception of the use of innovative banking technologies. The research results determined the impact of innovative technologies in banking processes on the quality of service, customer satisfaction, and consumer purchasing behavior. The research introduces the concept of «technology culture», which characterizes the degree of society's perception of innovative technologies and the determination of the capabilities and tasks of the bank management system to ensure the adaptation of clients to new technologies with minimal losses and maximum results.

Continuing the research of customer satisfaction with the provision of banking services, it is expedient to determine the impact of the development and implementation of electronic processes in the banking system and their impact on customer satisfaction. The analysis of the opinions of the respondents regarding the reliability of electronic

banking systems made it possible to form a set of factors influencing the opinions of consumers. Factor analysis, structural equation modeling, and group analysis of factors affecting consumer satisfaction were conducted in numerous types of research. In the structure of influence factors, the following factors were identified: level of security of financial transactions, the confidentiality of personal data and financial data, the usefulness of carrying out this or that financial transaction, accessibility for understanding, ease of use, convenience interface, and design. An innovative quality model of mobile banking services was developed based on analyzing the described indicators' weight parameters. As a result of the research, customer segmentation was also carried out, which allows the development of two fundamentally different approaches to different groups of customers to ensure the acceptance of innovative technologies in electronic banking. The research results allow us to use the model for the segmentation of banking systems management processes, particularly regarding the introduction of electronic banking (Rejman Petrović, Nedeljković *et al.* 2022).

Security has been identified as one of the priorities of innovative banking in many researches. Electronic processes define new requirements for financial security, new requirements for technologies for protecting personal financial data, the confidentiality of banking transactions, etc. Numerous authors have developed classifications of cyber fraud according to the scale of negative results and impact on the management processes of banking systems. The grouping was carried out by accumulating literature research and discussions in a focus group of cyber security experts. The predicted future made it possible to determine the priority groups of cyber security in the banking system, which require special attention in banking management systems. The results of the research were used to build a model for minimizing cyber security risks in the development system of electronic banking; in particular, in the practice of managing banking systems, it is possible to create ecosystems of a reliable environment through timely detection of failures and fraud, financial risk management, sustainable prevention of cyber fraud to protect banks as institutions, their employees, customers and the banking system at the macroeconomic level (Chhabra Roy and Prabhakaran, 2023).

Digital banking systems and their development are related to innovative technologies. The technological component is an essential aspect of the development of financial systems and the state's financial policy. Electronic banking, which is developed in many countries, is new for several countries and requires the search for effective management mechanisms at the level of public administration and the commercial banking system. In numerous researches, the authors identified among the practical factors influencing the development of electronic banking processes: payment systems, transactions, balance, and profits. Analysis of influence factors determined the critical role of electronic banking systems particularly payment systems using electronic funds. The number of payments made through electronic platforms is growing exponentially. Using the triangulation method, a synthesis of approaches related to descriptive and comparative analysis of existing electronic banking systems was carried out. The result of the research was the determination of the impact of digital currencies on payment systems and payment methods. The relationship between the work of the central bank, customer behavior and the bank's activities in the electronic banking system and the use of electronic payments was determined. (Jagrič, Fister, Amon *et al.*, 2022).

Analysis of individual consumers and their relationships with electronic banking systems is insufficient without a comprehensive analysis of household influences on electronic banking implementation processes. The method of moments used to research the relationship using a sample of respondents was generalized. This method made it possible to mathematically substantiate the choice of a strategy for managing household lending processes as an element of financial stability management. Also, the impact of such a management model on the processes of financial stability of the banking system and its security was determined. The transition from the strategy of managing individual clients to the analysis and work with households determines the increase in the volume of credit flows and the exchange of credit information as an element of influence on the stability of banks (Le and Nguyen, 2022).

Empirical research on the level of competitiveness of the banking system determined the effects

of factors on the financial stability of banking systems. Through the analysis of statistical data reflecting the results of banking activity of the market economies of the world's leading countries, it was determined that the stability of banks is connected with the openness and deregulation of financial markets. A directly proportional ratio of indicators of banking institutions' stability and the banking institutions' conversion volumes on the market has been determined. The impact of the quality of the institutional environment on the development of banking operations as an element of the state's financial policy is determined. It is proven that the institutional development of the banking system should be an essential element of bank management and banking policy because institutional quality strengthens the positive effect of banking concentration and financial stability (Tran, Nguyen and Nguyen, 2022).

Analyzing the most competitive markets for the provision of tourist services, the role of the banking system in ensuring entrepreneurial activity was determined. In particular, the developed model of analysis of the results of attracting credit funds from banking institutions to ensure the development of tourism enterprises allowed to confirm the role of bank lending in the development of enterprises, which is especially relevant in sectors of the economy with minimal barriers to market entry and high competition and a high degree of commercialization of the industry (Saienko, Mezentseva, Tolchieva *et al.* 2020).

The analysis of the effects of banking transformations on domestic business, in particular, enterprises, made it possible to determine that management systems at the microeconomic level are directly dependent on the transformations of the banking system. The projection of the results of such dependence determines the significant impact of external factors on the transformation of banking systems, as a result, the impact on entrepreneurial activity and business development (Hrosul, Kovalenko, Saienko *et al.*, 2021; Britchenko and Saienko, 2017).

The analysis of numerous researches made it possible to determine the performance indicators of banking institutions and the banking system. Operational efficiency was determined as one of these indicators. The influence of indicators on

the resulting parameters of the banking system was modeled. Among the influencing factors, operating efficiency was selected among the resulting indicators, labor productivity indicators, fixed assets, number of deposits, and non-interest income. The analysis of the proposed indicators made it possible to determine their overall impact by forming a dynamic model of impacts. The analysis of operational efficiency, defined in the model, is formed by calculating the efficiency ratio associated with the flexibility of management in the system of external transformations (Bangarwa and Roy, 2022). The research analysis made it possible to determine a hypothesis regarding the impact on the banking system of indicators characterizing deposits and loans, in particular, interest rates and their volumes.

The analysis of literary sources made it possible to determine the main directions of research related to the application of innovative approaches in the development of banking systems and the management of innovative banking support processes as elements of increasing efficiency and ensuring the development of banks at the level of commercial institutions and at the level of state fiscal policy, which will be investigated in the article.

Methodology

In the article, an analysis of literary sources was carried out, making it possible to synthesize the main research directions by using empirical and epistemological research methods. The analysis of statistical data on the development of the banking

system of the central economically developed financial systems of the world and the use of correlation-regression analysis methods made it possible to confirm the hypotheses of the influence of electronic banking systems on social processes and the influence of social processes on the development of digital banking operations. The projection of the statistical data analysis results determined the further growth of the number of users of electronic banking services. A management model of the optimal difference in loan and deposit rates is proposed as an element of monitoring the implementation of innovations and their impact on the stability of the development of the banking system, in particular e-banking.

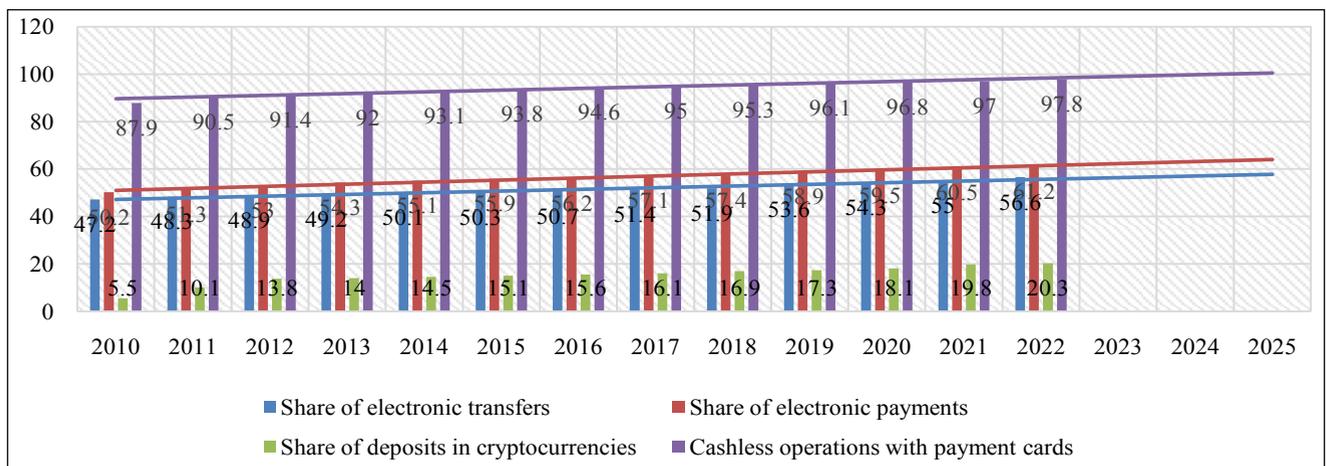
RESULTS

The analysis of literary sources made it possible to determine the main directions of ensuring the development of banking systems:

- ♦ introduction of innovative technologies,
- ♦ management of the effectiveness of the implementation of banking processes,
- ♦ providing orientation to the client’s needs as a result of all management processes.

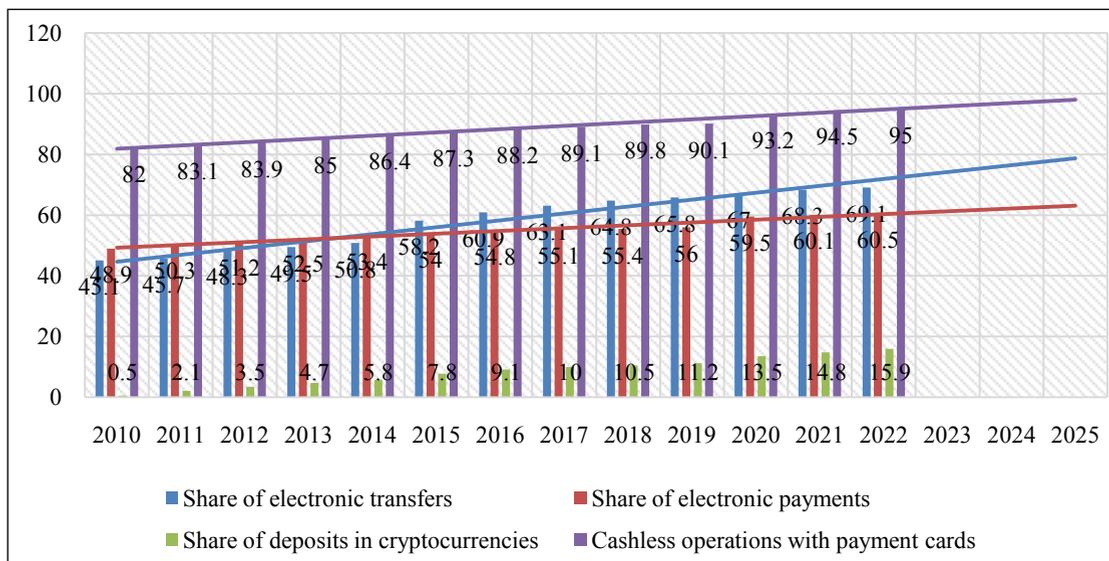
These tasks are identified as research priorities.

To analyze the process relevance of banking system digitalization, advisable to analyze the statistical data of the development of digital technologies. The summarized statistical data of the USA is presented in the diagram of Fig. 1.



*Source: Developed by the author based on the analysis of statistical data [International Monetary Fund].

Fig. 1: Analysis of the development of digital banking in the USA



*Source: Developed by the author based on the analysis of statistical data [The European Bank for Reconstruction and Development]

Fig. 2: Analysis of the development of digital banking in EU countries

Summary statistical data of the EU countries are presented in the diagram of Fig. 2.

The statistical data analysis shows the active development of digital technologies in the banking customer service system. For the USA, such trends are more active than for the EU countries, which can be associated with the rationalization of legislative support and de-regulatory processes in the economy, as well as the development of information technologies as the basis of a new type of economy - the digital economy.

The analysis of statistical data and the use of automated modeling systems made it possible to determine trends in the development of electronic processes in the banking system. Development trends confirm the hypothesis about the growth of electronic transactions in banking systems.

To find effective mechanisms for the development of banking systems managing advisable to turn to the modeling of banking processes. The modeling in the article will be based on the results of the literature analysis, which determined the relevance of modeling the processes of introducing innovative technologies and the analysis of statistical data on the development of electronic banking systems as a basis for the introduction of innovative technologies in banking operations.

For the development of effective practical recommendations, it is suggested to take the

management theory method as a basis. The first stage of modeling is goal setting. To determine the goals, the following hypotheses were formed:

- ♦ the banking system develops in conditions of open competition,
- ♦ competitive sectors of the economy develop due to the provision of consumer needs,
- ♦ the maximization of banks' income is directly dependent on the degree of satisfaction of consumer needs, the formation of loyalty,
- ♦ the bank's income is related to balancing the rates of attracting loans and deposits, which are formed due to the attraction of customers to the banking institution,
- ♦ the balancing of incoming indicators of loans and deposits affects the differentiation of rates, accordingly, ensures the further stability of the development of the banking institution and the banking system as a whole.

Having developed a hypothesis about the influence of loan and deposit rates on the competitiveness of the banking system and defining these indicators as indicators of customer orientation, it is advisable to develop a model of the effectiveness of the management of the banking system.

A parameter of the banking system management efficiency model is income optimization by adjusting the rate of loans and deposits. The model is based on

the proportional law of balance sheet management:
change in the loan rate – formula 1 –

$$\Delta l_{rk} K1_k \cdot \delta_{ba} \dots(1)$$

change of deposit rate – formula 2 –

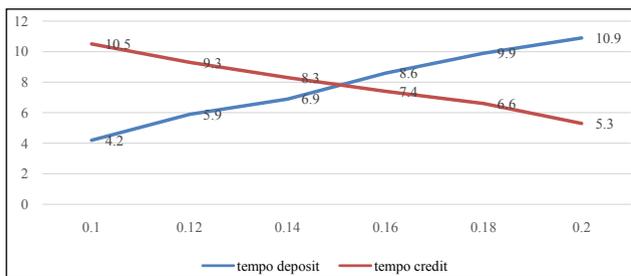
$$\Delta l_{rd} K1_d \cdot \delta_{ba} \dots(2)$$

Where $K1_k, K1_d$ – amplification factors,

δ_{ba} – the difference in rates of deposits and loans.

rk – the rate of deposits and loans

Based on the formulas, we will calculate the dependency for various loan and deposit rates: 0.1; 0.12; 0.14; 0.16; 0.18; 0.2, and rates of deposits and loans calculated because of the research. The results of dependence modeling are presented in Fig. 3.



*Source: Developed by the author based on calculations made according to formulas 1, 2.

Fig. 3: Modeling the dependence of influencing factors on the rate of growth of the number of deposits and loans

Modeling the interdependence of the rate of deposits and loans on their growth rates made it possible to determine the trend that every 0.02% change in the rate contributes from 1 to 1.7% to the rate of growth in the number of deposits and the decrease in the number of loans. So, the modeling processes made it possible to confirm the hypothesis that to increase the rate of loans, it is advisable to reduce the rate. To increase the rate of deposits, it is appropriate to increase the rate.

DISCUSSION

As a result of the conducted research, trends in the development of the banking system were determined it was determined that the basis of the formation of innovative mechanisms for the development of the banking system is the

introduction of electronic banking and digital technologies. For the introduction of innovative technologies in the conditions of an open market and high competition, it is advisable to determine the role of the effectiveness of bank process management processes. Modeling of management processes made it possible to determine the dependence between the rate of deposits and loans, which is a characteristic of the bank's customer orientation and profitability, and the rate of deposits and loans.

Analyzing the static data of the world's leading countries regarding the use of digital technologies and e-banking, the following was determined:

- ♦ the number of e-banking operations tends to constant growth,
- ♦ the banking system is developing at a constant pace. However, more significant jumps in the growth of indicators are observed with the beginning of quarantine restrictions, which is logical given the reduction of social contacts, correspondingly, the increase in the number of electronic payments and other electronic banking operations,
- ♦ in the total amount of transactions with payment cards in the world's leading economies, non-cash payments prevail,
- ♦ modeling of the interdependence of the rate of deposits and loans on their growth rate made it possible to determine the trend that every 0.02% change in the rate contributes from 1 to 1.7% to the rate of growth of the number of deposits and loans.

The directions of further research will determine the interdependence of the share of application of electronic deposit and credit systems to the rates of loans and deposits.

The debatable position of the research is the determination of the uniformity of the developed models for all social groups. Also, it is advisable for further research to determine the impact of the safety factor on the rates of deposits and loans as a possible reverse element to the assessment of interdependence to the interest rate.

CONCLUSION

As a result of the research of literary sources, the

analysis of statistical data on the development of the banking industry, and the modeling of the interdependence of the factors that form the banking system's profitability, the following was determined. The banking system is a complex element of the state's economic system, the transformations of which directly affect economic processes. The complexity and multifactorial processes of influence on the banking system determine the need for a comprehensive, systematic analysis of industry development trends and trends, as well as the provision of effective management mechanisms. The development trends of the industry are determined by the introduction of innovative digital technologies. Statistical data analysis has determined constant trends toward the growth of customers' interest in conducting banking operations in digital format. The introduction of new technologies involves not only the attraction of new customers but also the identification of barriers to the adaptation of bank customers to innovations. Having determined the factors affecting customer orientation and ensuring the competitiveness of banking institutions by attracting new and retaining old customers, it was proposed to estimate the influence of factors of changes in the rate of deposits and loans on the rates of deposits and loans, which determined the possibility of regulating profitability using managerial influences on these indicators and modeling the results banking activity.

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