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V.N. KARAZIN KHARKIV NATIONAL UNIVERSITY**

Karazin Banking Institute

Department: **Banking Business and Financial Technologies**
Specialty: **072 Finance, Banking, Insurance and Stock Market**
Educational
program: **Financial Technologies and Banking Management**
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QUALIFYING MASTER'S THESIS

on the topic:

DIGITALIZATION OF BANKING BUSINESS

higher education student **Bai Xianyu**

The qualifying master's thesis was accepted for
defense by the decision of the Department of
Banking Business and Financial Technologies

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**TASK
FOR THE QUALIFYING MASTER'S THESIS**

of Bai Xianyu

1. Topic of the work "DIGITALIZATION OF BANKING BUSINESS".

Scientific adviser Doctor of Economics, Professor Borys Samorodov

(surname, first name, patronymic, academic degree, academic title)

Approved by order of the university dated September 17, 2024 No. 4601-5/1025.

2. Deadline for the student to submit the work November 18, 2024

3. List of issues to be developed:

In Chapter 1: to reveal the essence of the concept of "bank financial stability" and provide its classification, determine the need for bank credit risk management in the system of ensuring its financial stability, characterize the organizational and legal support of the bank's financial stability system and its credit risk management, to provide technical and economic characteristics of JSC CB "PrivatBank".

In Chapter 2: to analyze the level of credit risk management of the banking system of Ukraine in order to ensure its financial stability, to assess the level of financial stability of the banking system of Ukraine, to calculate the level of credit risk of JSC CB "PrivatBank".

In Chapter 3: to investigate stress testing as a modern tool of risk management, to consider credit risk management in the bank in order to ensure its financial stability, to determine the directions of state policy to ensure the financial stability of domestic

banks.

4. Work plan

No.	Name of work stages
1	The choice of the topic of the qualifying master's thesis
2	Approval of the plan and tasks of the qualifying master's thesis
3	Completion of a qualifying master's thesis
4	Submission of a qualifying master's thesis to the department to check for borrowings from other documents
5	Admission by the head of the department to the defense of a qualifying master's thesis
6	Defense of a qualifying master's thesis

5. Date of the task issue September 25, 2024

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ABSTRACT
ON THE QUALIFYING MASTER'S THESIS
"DIGITALIZATION OF BANKING BUSINESS"

of Bai Xianyu

The qualifying master's thesis comprises 93 pages, 17 tables, 17 figures, 19 formulas, 1 appendix, and a list of 79 references.

The **object of research** is the process of credit risk management in the system of ensuring the bank's financial stability.

The **subject of research** is the modern methods of assessing credit risk levels and managing them within the system of ensuring the bank's financial stability.

The **purpose of the qualifying master's thesis** is to summarize the theoretical foundations of organizing credit risk management to ensure the financial stability of the bank.

The **tasks of the qualifying master's thesis** are as follows:

- to reveal the essence of the concept of "financial stability of the bank" and provide its classification;
- to determine the need for managing credit risk in the system of ensuring the bank's financial stability;
- to characterize the organizational and legal support for the bank's financial stability system and its credit risk management;
- to provide technical and economic characteristics of JSC CB "PrivatBank";
- to analyze the level of credit risk management in the banking system of Ukraine to ensure financial stability;
- to assess the level of financial stability of the banking system of Ukraine;
- to calculate the credit risk level of JSC CB "PrivatBank";
- to explore stress testing as a modern tool for risk management;
- to consider credit risk management in banks as a way of ensuring financial stability;
- to determine the directions of state policy aimed at ensuring the financial stability of domestic banks.

Based on **the results of the research**, theoretical and practical provisions are formulated, which the author has developed into specific proposals for improving the credit risk management system to ensure the financial stability of banks.

The obtained results can be used to calculate credit risk levels and evaluate the quality of credit portfolio management, ensuring financial stability and minimizing credit risks.

KEYWORDS: Credit Risks, Financial Stability, Credit Portfolio, PrivatBank, Risk Management.

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INTRODUCTION

The banking system of Ukraine is currently in a state of restructuring. Today, the management bodies of both the central bank and commercial banks face the issue of effectiveness and adequacy of risk management principles and tools. The amount of credit risks accepted by the bank directly affects the level of financial stability. In this regard, the study of credit risk management issues in the system of ensuring the financial stability of the bank acquires special importance, which determines the relevance of the chosen topic and the feasibility of conducting research for the development of this issue.

The issues of ensuring the financial stability of banks were the subject of serious scientific research and were considered in the works of such domestic and foreign economists: G. Azarenkova, O. Baranovsky, O. Vasyurenko, V. Gluschenka, O. Golovko, S. Drobyshevskyi, Zh. Kaminsky, V. Korneeva, M. Krupky, M. Matovnikova, N. Pogorelenko, L. Primostki.

The following domestic and foreign scientists paid attention to the issue of bank credit risk management: N. Bobyl, V. Vitlinskyi, N. Volkova, P. Dadashova, V. Dzyublyuk, A. Epifanov, M. Kvasniy, O. Klyusko, V. Kovalenko, V. Mishchenko, L. Ostankova, N. Prytula, L. Shoemaker.

The purpose of the work is to generalize the theoretical foundations of the organization of credit risk management in the system of ensuring the financial stability of the bank.

To achieve the set goal, the following tasks are solved in the work:

- reveal the essence of the concept of "financial stability of the bank" and provide its classification;
- to determine the need to manage the bank's credit risk in the system of ensuring its financial stability;
- characterize the organizational and legal support of the bank's financial stability system and its credit risk management;

- to provide technical and economic characteristics of JSC CB "PrivatBank";
- to analyze the level of credit risk management of the banking system of Ukraine to ensure its financial stability;
- assess the level of financial stability of the banking system of Ukraine;
- calculate the level of credit risk of JSC CB "PrivatBank";
- explore stress testing as a modern risk management tool;
- consider credit risk management in the bank in order to ensure its financial stability;
- determine the directions of state policy to ensure the financial stability of domestic banks.

The object of the study is the process of credit risk management in the system of ensuring the bank's financial stability.

Subject of research – modern methods of assessing the level of credit risks and their management in the system of ensuring the financial stability of the bank.

A number of general scientific and special research methods were used in the work, namely: theoretical generalization – to study and systematize existing theoretical approaches to determining the content of credit risk management in the system of ensuring financial stability; a systematic approach to the study of organizational and economic support, a graphic method for the purpose of summarizing statistical data and their analysis; mathematical modeling - for calculating the main indicators of the level of credit risks for the purpose of their further assessment and interpretation.

The scientific novelty of the qualifying master's thesis consists in the generalization of the existing theoretical provisions regarding the definition of the concept of "credit risks", as well as in the application of mathematical modeling tools and methods for assessing the level of credit risks of JSC CB "PrivatBank".

The issue of credit risk management and financial stability of the banking system of Ukraine is given considerable attention by the state and the National Bank of Ukraine, which was reflected in the Laws of Ukraine "On the National

Bank" dated 05/20/1999. No. 679-XIV (with amendments and additions), "On banks and banking activity" dated 07.12.2000, No. 2121-III (with amendments and additions), Resolution of the Board of the National Bank of Ukraine "On the approval of the Regulation on the determination by banks of Ukraine of the amount of credit risk for active banking operations" No. 351 dated 06/30/2016, Resolution of the Board of the National Bank of Ukraine Methodological guidelines for the inspection of banks "Risk assessment system" No. 104 of 15.03.2004y., Resolution of the Board of the National Bank of Ukraine "On the approval of Methodological recommendations regarding the procedure for stress testing in banks of Ukraine" No. 460 dated August 6, 2009. and other legal acts.

The information base of the research is data from the State Committee of Statistics of Ukraine, the National Bank of Ukraine, the Association of Ukrainian Banks, and other statistical sources.

CHAPTER 1

THEORETICAL BASICS OF CREDIT RISK MANAGEMENT IN THE SYSTEM FOR ENSURING THE FINANCIAL STABILITY OF THE BANK

1.1. The essence and classification of the bank's financial stability

Ensuring the financial stability of banks is a necessary condition for the effective functioning of the economy of Ukraine. Today, strengthening the financial stability of banks in Ukraine, their dynamic development, increasing trust, and therefore maximizing the positive impact of the banking system on the processes of economic development necessitate the improvement of banking activities in such a way as to ensure the profitability of the banking business and protection against possible risks.

In scientific studies, the concept of financial stability is considered in many scientific works (Table 1.1) [2-7].

Thus, after analyzing the definitions of domestic and foreign scientists, we believe that the financial stability of the bank is the ability of the bank to perform its functions as effectively and with minimal risk under the influence of internal and external factors, ensuring profitability and reliability of saving and returning deposits of its customers.

According to the stability of the bank's work, the National Bank of Ukraine distinguishes the following types of financial stability: normal, characterized by stable activity, absence of non-payments or delays in fulfilling obligations, sufficient profitability; an unstable financial state, for which delayed payments and a low level of profitability, etc., are normal, and a crisis financial state, which is characterized by constant non-payments, the presence of overdue debts, etc., can ultimately lead to bankruptcy [1].

Table 1.1

Determination of the financial stability of the bank

Author	Definition
V. Zatvarska[2]	The balance of the components of the banking system, the presence of interconnected and mutually coordinated proportions between them both in the sectoral and regional aspects, as well as the preservation of balance and effective interaction with the financial and macroeconomic systems
P. Kallaur[3]	Not a simultaneous state of a system, but a characteristic of its ability to function effectively over a long period of time, maintaining equilibrium and preserving its structure
L. Klusko [4]	Compliance with parameters of the bank's activity (capital, liquidity, solvency, profitability, level of problem assets, etc.) within permissible limits. Dynamic financial stability means balanced and balanced growth of positive parameters of the bank's activity and reduction of negative parameters of the bank's activity within the limits of permissible risk in accordance with the defined system of agreed strategic and current goals of its functioning in the process of progressive development
O. Baranovsky [5]	The ability to withstand external and internal influences, maintaining stable balance and reliability over time
V. Kochetkov [6]	The ability of the bank as a system of transformation of the bank's resources (personnel, financial resources, assets, equipment and information technologies) with maximum efficiency and minimum risk to perform its functions in the market environment despite the influence of endogenous and exogenous factors
I. Cellar [7]	An integral characteristic of the bank's ability as a system of transformation of resources and risks to fully (with maximum efficiency and minimum risk) perform its functions, withstanding the influence of external and internal environmental factors

In accordance with the above, the main approaches to the formulation of the concept of financial stability of the bank can be presented in fig. 1.1 [8].

The financial stability of banks in Ukraine is influenced by the factors presented in the table. 1.2 [2-4]. Taking into account these factors, banks will develop a system of measures to minimize the risks they encounter during their activities.

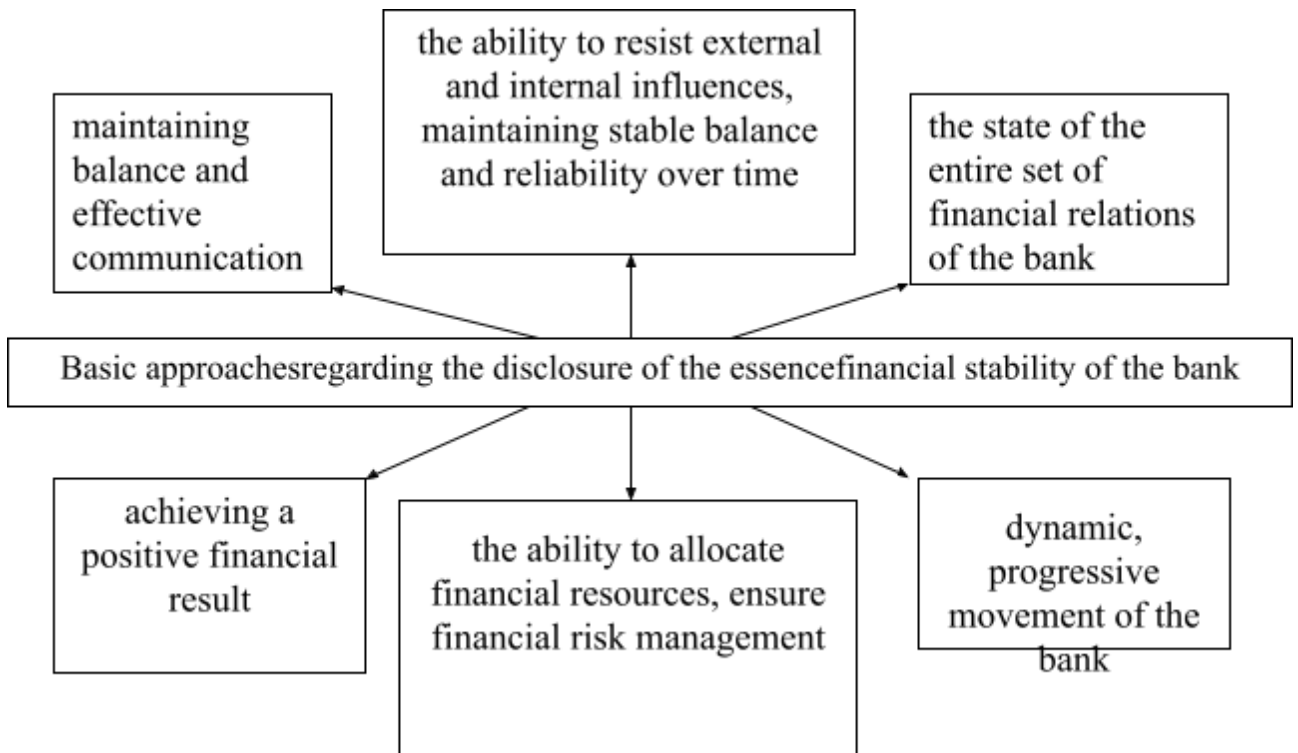


Fig. 1.1. Basic approaches regarding the disclosure of the essence financial stability of the bank

Due to the observance of specific principles, it is possible to ensure the financial stability of domestic banks. These principles are presented in Appendix A. The practical implementation of these principles gives banks the opportunity to make a profit from their activities, while maintaining their stability in a competitive environment.

It should be noted that one of the NBU's supervisory functions is monitoring the financial stability of the banking system. Its purpose is to provide information that will reflect the results of the banking system of state administration bodies and the banking system.

Macroprudential policy is a policy aimed at preventing the accumulation of systemic risks and their realization in the financial sector, as well as increasing its stability and resilience. Ensuring financial stability is the ultimate goal. The need to develop a macroprudential policy is caused by the fact that the system contains interdependent components, therefore the sector should be regulated as a system,

and not only at the level of individual institutions. Macroprudential policy cannot eliminate systemic risks completely, but it can prevent their excessive accumulation and reduce the probability of their realization.

Table 1.2

Factors affecting the financial stability of the bank

Name	External	Internal
Economical	investment climate; the state of the balance of payments and the economy, tax policy; instability of legislation; inflation rate; budget deficit or surplus	capital adequacy; quality of assets and liabilities; profitability and liquidity
market/ Organizational	instability of the currency market; inflation rate; volumes of capital outflow abroad	state of bank management; ability to innovate, change; internal management structure; marketing and strategies of the bank
Socio-political / Technological	political and social stability; citizens' trust in the country's credit and financial system	the level of technical equipment with means of automation and computer equipment; focus on the development of modern banking technologies; market needs for new banking products
Financial	interest, credit and currency policy of the NBU; the state of the money market; the amount of currency reserves of the NBU	financial strategy and asset structure, etc

Thus, to ensure the financial stability of the bank, it is necessary to have a flexible capital structure, constantly organize its circulation with an excess of income over expenses in order to maintain solvency and create conditions for its development. The development of the financial stability management system of commercial banks involves an objective definition, that is, an assessment of its current and desired state. That is why effective management and ensuring one's own financial stability in the conditions of a financial crisis should be the duty and main strategic task of every commercial bank.

1.2. Necessity of managing the bank's credit risk in the system of ensuring its financial stability

In today's world, the issue of banking risks occupies a significant place, because it is accepted that the activities of banks are effective when the risks they take are under control and within their financial capabilities. Today, lending is the most profitable and dynamic banking operation, and because of this, credit risk is one of the main objects of research in banking. Therefore, the development of effective credit risk management in domestic banks is an integral part of banking activity. Effective risk management is achieved by analyzing the essence of credit risk and determining the factors that affect it. Scientists pay considerable attention to the definition of the concept of credit risk (Table 1.3.) [9-16].

Thus, a critical analysis of the definitions of credit risk led to the following conclusion. In our opinion, credit risk is defined as the probability that the borrower, as a result of external and internal factors, will not be able to fulfill his obligations to the creditor, due to which the creditor will not be able to receive the planned income from the transaction.

The formed definition summarizes modern approaches to the interpretation of the concept of "credit risk" and:

- focuses attention on the subjects (creditor, borrower) of the credit transaction and the object (cost);
- notes the planned receipt of income as the immediate purpose of the operation;
- notes that non-payment of a loan can occur due to the action of both external and internal factors, thus the occurrence of credit risk becomes possible both due to the fault of the borrower, the creditor, and due to the adverse impact of the macroeconomic situation on their activities.

Table 1.3

Definition of the concept of "credit risk"

Author	Definition
U. Vladychyn [9]; N. Cobbler [10]	the probability that the borrower will not pay the principal debt and interest for using the loan within the terms specified in the loan agreement;
T. Kosovo [11]	the degree (degree) of uncertainty regarding the occurrence of undesirable events during the implementation of financial transactions, the essence of which is that the counterparty of the bank will not be able to fulfill its obligations and at the same time will not be able to use the provision of return of borrowed funds.
B. Karpinsky [12]	the risk of non-fulfillment by the borrower (the bank's counterparty) of obligations under credit transactions (that is, the risk that the borrower's payment of interest and principal under credit transactions will be made with deviations from the terms of the credit agreement or will not be made at all);
V. Bobyl [13]	the probability that the borrower will not fulfill his obligations to the bank;
Basel Committee on Banking Supervision [14]	the possibility that the borrower of the bank or the counterparty will not be able to fulfill its obligations with previously achieved conditions
I. Demczyk [15]	the potential possibility of losing principal and interest on it, which arises as a result of a violation of the integrity of the movement of the loan value under the influence of various factors;
V. Vitlinsky [16]	a set of probable, undesirable events during the implementation of financial transactions, the essence of which is that the counterparty of the bank will not be able to fulfill the obligations assumed and at the same time will not be able to use the available means of protection;

Credit risk management is formed on the basis of the following basic principles:

- credit risk is consciously accepted in order to receive income from a credit transaction;
- the scale of the consequences of accepting credit risk must be taken into account;
- application of risk minimization methods is a necessary condition during its management;
- management takes place both at the level of individual risk and at the level of the credit portfolio;

- the level of accepted credit risk and the level of profitability are interdependent and must be equal to each other;
- the accepted credit risk must correspond to the bank's financial capabilities and the amount of its own capital;
- costs to reduce negative results due to credit risk should not exceed possible losses from it;
- the term of the credit transaction directly affects the level of risk, the longer the term, the higher the risk, which requires additional income of the bank;
- management takes place in accordance with the bank's strategy and credit policy;
- the possibility of risk transfer or its insurance [16].

The practical implementation of these principles will make it possible to reduce losses in case of credit risk and effectively manage it.

We believe that a comprehensive approach to credit risk management should include six main stages of management (Fig. 1.2) [13], First of all, it should be the definition of management tasks and goals, which are aimed at developing clear strategies within the framework of credit policy. They will provide an opportunity to determine the specifics of the corresponding impact on the degree of risk and the specifics of the credit risk management process.

Based on the above, the bank may resort to one of the following strategies at the time of credit activity:

- minimization of risks (preserving the financial results of the bank's activities, which are achieved through insurance operations, hedging, formation of the optimal level of the loan portfolio, as well as obtaining average profits).
- profit maximization (the bank consciously assumes credit risk, during management, an aggressive credit portfolio is formed).
- The content of the management stages, their characteristics and the results that will be achieved as a result of their implementation are given in the table. 1.4 [17].

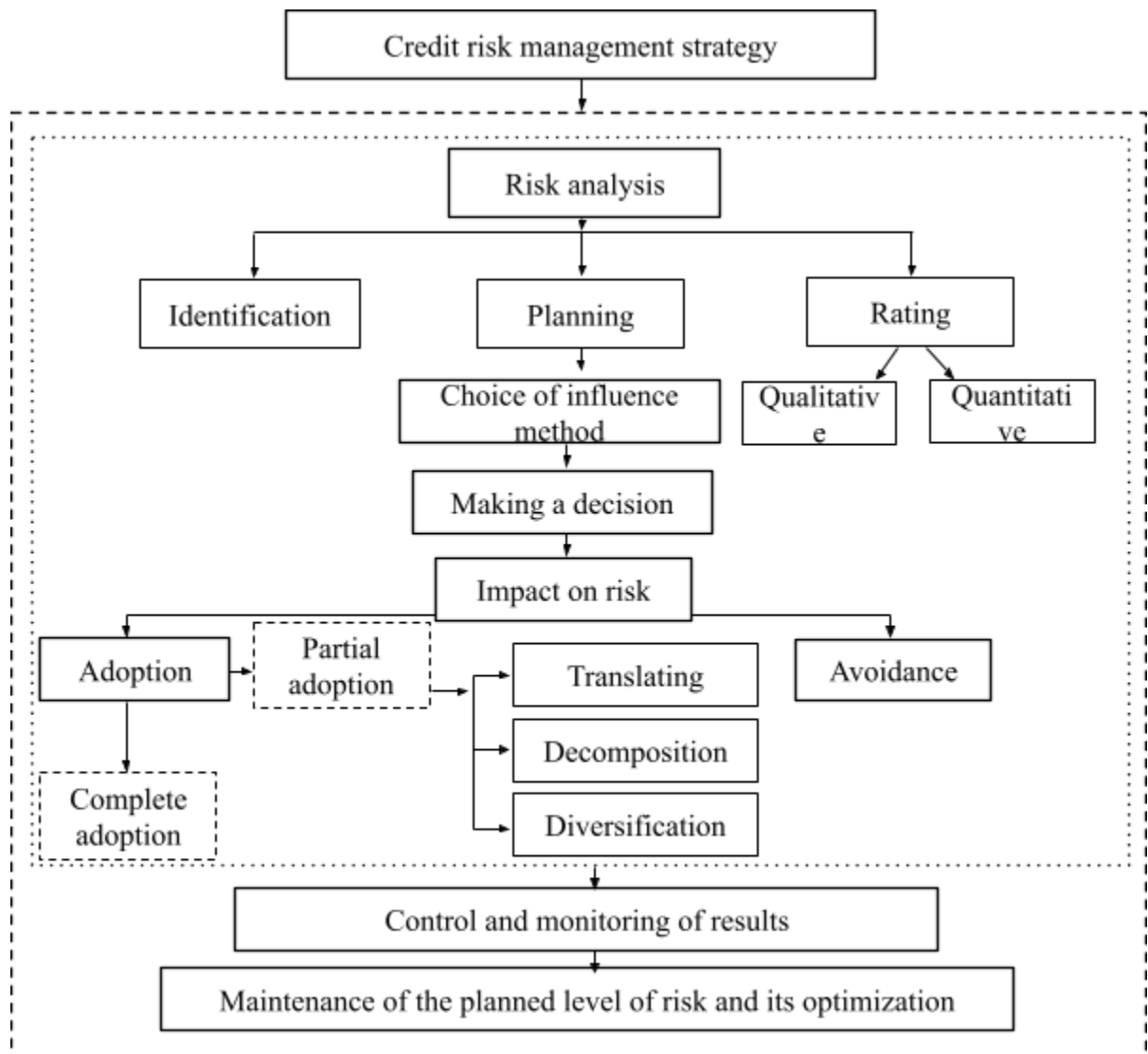


Fig. 1.2. Stages of bank credit risk management

In order to effectively apply credit risk management methods and take into account all the features of its occurrence, it will be appropriate to distinguish the following hierarchical levels:

- portfolio - credit risk management methods are applied to the general credit portfolio;
- individual - analysis, assessment and minimization of credit risk is carried out in relation to a separate loan or borrower.

Table 1.4

The content of credit risk management stages and the result of implementation

Stage	Content	Result
Preparation of credit risk management strategy	Development of Credit Policy, Risk Management Policy, Credit Risk Monitoring Policy, determination of tolerance levels and regulation of management decisions in accordance with the bank's strategic goals, development of management tactics components.	Formation of the appropriate regulatory and methodological base for the possibility of making correct management decisions and high-quality organization of the bank's credit risk management.
Credit risk planning	Determination of the purposes for which the loan will be granted, normalization of the level of acceptable risk of the credit transaction in accordance with the principles of the Credit Policy, justification of the bank's credit products according to the risk/income principle.	Identification of "weaknesses" in the borrower's activity and shortcomings in the developed credit products in order to accept only the planned level of risk, which will not pose a threat to the bank.
Risk identification	Identification of uncertainty in the borrower's activities, study of sources of threats and possible losses. Distribution of factors according to their significance and development of a risk map	Formation of an idea of threats and risks among bank employees, as well as analysis of their impact on the borrower's activity and the bank's credit portfolio.
Assessment and measurement of risk	Quantitative and qualitative assessment of the level of risk, its possible duration and the threats it can cause. Consolidation of risk assessment and forecasting methods.	Formation of risk assessment criteria, form and size of its manifestation and impact on the efficiency of banking activity.
Choice of risk management methods	Form and regulate risk management methods, analysis of the effectiveness of their impact on a risk event and effectiveness in a specific credit transaction. Verification of compliance with limits, reserves, standards.	Provision of a set of management tools in accordance with accepted methods.
Evaluation of results, control and correction	Control and monitoring of the practical implementation of management methods and development of tactical recommendations for their optimization.	Timely detection of errors and deviations from the expected results and formation of proposals for their correction.

Based on the indicated levels, it is possible to divide into individual credit risk and credit portfolio risk.

By the term individual credit risk, we mean the probability that the borrower will not fulfill all his obligations under the credit transaction, which means that the possibility that the loan payments due to the influence of external and internal

factors will be made with a deviation from the terms of the credit agreement. Accordingly, the main goal of individual credit risk management is to reduce the probability of losing borrowed funds [17].

However, in order to ensure the efficient operation of banking institutions, it is not enough to consider credit risks only from the individual level, because they, being correlated with each other and influencing each other, are combined in the credit portfolio into an aggregate credit risk. Only then can a conclusion be drawn regarding the effectiveness of the bank's credit activity, and hence its functioning as a whole.

Therefore, the total amount of credit portfolio risk directly depends on the amount of individual credit risks. The degree of interdependence between individual borrowers is also a determining factor - the lower it is, the lower the overall credit risk. Thus, the assessment of credit risk should be carried out at the level of the credit portfolio as a whole, because the indicators of individual elements do not carry complexity and can cause an increase in the level of credit risk by correlation with the general indicator, and thereby negatively affect the financial condition of the bank. Also, it should be taken into account that the risk of the loan portfolio may arise due to the improper fulfillment of obligations by several borrowers at the same time, as a result, the quality indicators of the loan portfolio will not meet the established norms, thereby the bank will suffer losses.

1.3. Organizational and legal provision of the bank's financial stability system and credit risk management

The need and purpose of the mechanism for ensuring financial stability is determined by the problem of practical provision of financial stability of banks at the macro- and micro-level for their proper functioning and stable development, on the one hand, and also, with the aim of creating basic prerequisites for banks to

fulfill their functions, to realize their role in the economy on the other hand, which is reflected in the reliability of the banking system as a whole, in the economic development of the country and the speed of market transformations in the process of social reproduction.

To maintain any economic system, including a bank, in a certain state or to achieve higher results, a necessary condition is coordinated activity. Ensuring the financial stability of the bank is a complex and multifaceted process, which is carried out with the help of the interaction of various forms, methods, tools, levers and ways of influencing the subject of management on its object based on a clearly developed concept. The process of ensuring the financial stability of banks is aimed at the application of certain methods (Fig. 1.3), which are interconnected in the process of their implementation: planning, analysis and evaluation of the main elements, regulation of the financial stability of commercial banks and control over the activities of the banking institution. As can be seen from Figure 1.3, the process of ensuring the financial stability of banks consists of the main elements, which we will consider in more detail.

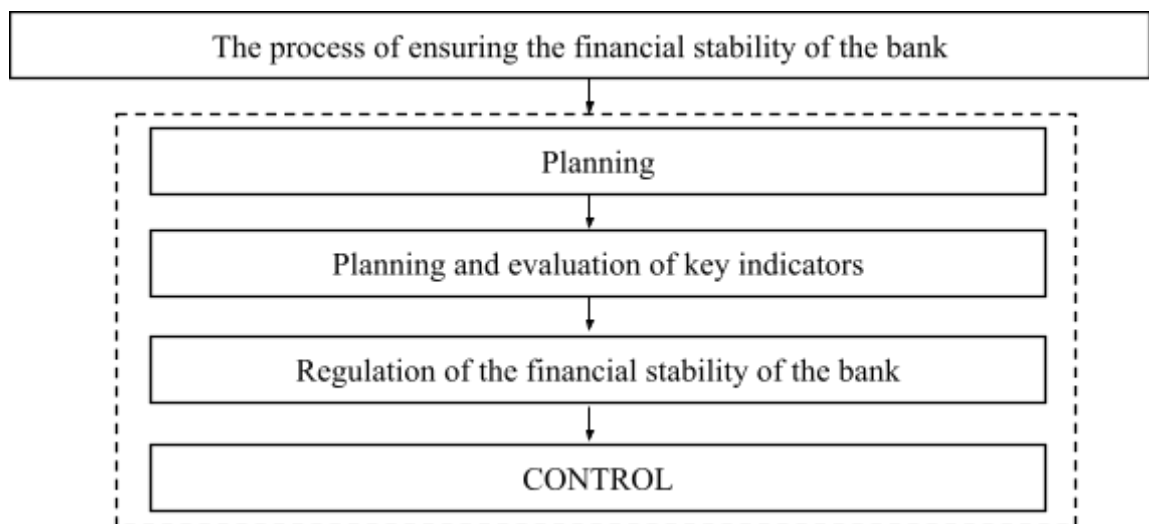


Fig. 1.3. The process of ensuring the financial stability of the bank

The planning process is necessary for setting goals, defining tactics and strategies for achieving the main goal (ensuring the bank's financial stability).

Direct implementation of complex financial planning of the bank takes place at the operational level, where it is disclosed through planning and control of operational activities, and should be aimed at planning assets and liabilities, planning the amount of equity capital and taking into account risks. At the same time, liquidity risk, credit risk, and operational technological risk have the greatest influence that determines the specifics of financial planning in the bank today [18].

The next element of ensuring the financial stability of the bank is the analysis and assessment of the main elements that determine the stable financial condition of the banking institution. The analysis makes it possible to identify the cause-and-effect relationships of various aspects of the bank's activity. It is with the help of analysis that you can quickly calculate how the financial indicators that determine the level of financial stability change and, accordingly, make a reasoned decision aimed at ensuring it.

Today, several methodological approaches are used to assess the financial stability of a bank. The simplest is the ratio analysis, which is based on the calculation of a wide list of financial indicators (liquidity, capital adequacy, profitability, risk level) [19]. This method allows for a detailed and comprehensive study of the bank's activities and to identify specific features of its functioning, but it does not allow to determine a generalized assessment of financial stability, since reliable conclusions about the bank's financial stability are possible if the entire mass of information about the bank, which is often confidential, is processed.

Integral methods make it possible to determine financial stability as one quantitative characteristic and provide an opportunity for comparative analysis of a large group of banks. When applying integral methods, financial stability is calculated as an aggregated set of basic indicators. That is, the positive features of the integral method are relatively insignificant complexity of calculations, obtaining one quantitative characteristic of the bank's financial condition. It can be noted that the integral method is the most acceptable when conducting remote analysis, which does not involve a high level of detail. The main problem when using this method is the correct determination of the weighting factors [20].

The point-rating method is based on the analysis of individual areas of the bank's activity, namely: capital, asset quality, management quality, profitability, management and risk (according to the SAMELSO system). For each of the listed characteristics of the banking institution's activity, points are determined that correspond to the level of the institution's activity and form an overall score. The main drawback of this method is that it is characterized by subjectivism. Therefore, the integral indicator as a whole for the bank can be calculated only on the basis of complex group indicators [21].

Regulation of the financial stability of banking institutions can be carried out with the help of a complex of techniques and methods.

Self-regulation (internal regulation) is current, operational management using appropriate methods of managing own capital, assets and liabilities, profit, liquidity and solvency, risks.

Next, we will consider control as one of the stages of ensuring the financial stability of the bank, which consists in checking the compliance of the obtained results with the planned indicators, the optimal values of which contribute to increasing the level of financial stability of the bank. In order to maintain control over the level of financial stability of the bank and effectively ensure it, it is necessary to observe the passage of all phases of control (previous, current, subsequent), both by supervisory bodies and directly by banks [8].

Note that ensuring the financial stability of the bank is determined by such characteristics as: level of capitalization; asset quality; quality of obligations; level of solvency and liquidity; profitability level; quality of capital management, assets and liabilities, solvency, liquidity and profitability; the level of sensitivity of the bank to risks and the quality of their management. Important characteristics of the bank's financial stability are the quality of assets and the quality of the bank's liabilities [22].

The management of accepted credit risks of banks should be considered on the basis of problem loans, because their share remains quite large in the loan portfolio of banks in Ukraine. The emergence of problem loans requires the

formation of significant reserves by banks to cover them, limiting the amount of funds directed to lending. Therefore, reducing the burden of reserving funds by credit institutions is one of the key tasks of the banking system. One of the reasons for the situation with an increase in the mass of non-performing loans is the lack of a mechanism for their implementation, numerous conflicts of legislation, thanks to which it is possible not to return the received loans, which gives significant advantages to unscrupulous borrowers over those who properly fulfill their obligations obligations, as a result of which the latter, due to the banks' artificially inflated interest rate on the loan, are forced to pay both for themselves personally and for the borrower who avoids returning the loan. In addition to the above, this is influenced by a number of negative factors, such as the protracted economic crisis in the country and the associated low solvency of the population, a fairly high level of the real (effective) interest rate on loans, which significantly reduces the ability of borrowers to service loans, high credit risk. Unfortunately, certain provisions of the tax legislation also do not contribute to the reduction of problem loans. So, in particular, the sale of the loan by the bank below its nominal value (discount), or in general the write-off of the debt (debt forgiveness) can lead to negative tax consequences for the parties to the contract.

In order to return loan funds, financial institutions have the right to use the mechanisms of restructuring problematic debts and/or partial forgiveness (write-off) of debt, selling them at a discount (below their nominal value), foreclosing on credit collateral (in particular, mortgages), applying to court with lawsuits on debt collection under credit agreements, initiating bankruptcy of the debtor, etc. One of the mechanisms for increasing the repayment of loans is the restructuring of loans, in accordance with the Law of Ukraine "On Financial Restructuring" [23], which was supposed to be aimed at creating an effective and efficient mechanism for the voluntary financial restructuring of the debts of Ukrainian enterprises and their pre-trial rehabilitation. The specified Law defines the conditions and procedure for carrying out the procedure of voluntary financial restructuring of the debtor, who has the right to participate in the procedure of

financial restructuring in the event that he is in a critical financial state, and his economic activity can be recognized as promising. However, the said Law did not fully satisfy the creditors' hopes. The amount of restructuring of non-performing loans since its adoption is only millions of hryvnias instead of hundreds of billions of existing problem assets. One of the significant obstacles to this was and is still preserved to this day, the practice of banks issuing loans to related parties.

Debt settlement is one of the main activities of creditors. Solving this problem is impossible without proper regulatory and legal support, first of all, the adoption of the necessary legislative acts aimed at creating transparent rules of activity on the credit borrowing market, as well as providing appropriate guarantees to all its participants. In the banking environment, with the participation of NBU specialists, the necessary draft laws were developed, the purpose of which is to overcome crisis phenomena and restore lending in Ukraine. At the same time, the position of the NBU and commercial banks in the market of credit loans is characterized by their efforts to maximally ensure the interests and guarantees of creditors, i.e. banks, while largely ignoring the rights and interests of borrowers, primarily individuals.

In addition to the above-mentioned Law of Ukraine "On Financial Restructuring", February 6, 2018. the parliament adopted the Law of Ukraine "On Amendments to Certain Laws of Ukraine Regarding the Creation and Maintenance of the Credit Register of the National Bank of Ukraine and Improvement of Credit Risk Management Processes of Banks" [24], the purpose of which is to reduce the level of credit risk, ensure the security of banking operations, increase the reliability and stability of the banking system in order to protect the interests of depositors and other creditors of the bank. The law provides for the creation and maintenance of the NBU Credit Register - an information system that ensures the collection, accumulation, storage, modification, use and dissemination (provision) of information on bank credit operations and the state of fulfillment of obligations under such operations, analysis and classification of loans. The NBU is obliged by this Law to provide banks with access to information from the Credit Register in

real time on a free basis within the limits specified by law. Information from the Credit Register is used by banks exclusively for credit risk assessment. Information about credit operations carried out by banks with respect to debtors is submitted by them to the Credit Register if the amount of debt (in terms of principal amount and interest) for such credit operations is equal to or exceeds 100 times the minimum wage (or the equivalent of this amount in foreign currency). In turn, information on the credit operations of banks, in respect of which the NBU has made a decision to assign them to the category of insolvent or to revoke the banking license and liquidate, is submitted to the Credit Register by the Individual Deposit Guarantee Fund directly or by a person authorized by it. Creation of the Credit Register will help to avoid granting loans to persons with a negative credit history in the future.

The next legislative act is the Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine Regarding the Restoration of Crediting" [25]. The purpose of the specified Law was to prevent the situation of honest borrowers from worsening and reducing their legal rights in the course of systematic legislative regulation of loopholes used by unscrupulous debtors to avoid fulfilling their obligations.

The law introduced a number of comprehensive changes to the Central Committee of Ukraine, as well as the laws of Ukraine "On mortgages" [26], "On banks and banking activities", "On collateral" [27] and some others aimed at protecting the interests of the banking sector (creditors) from unscrupulous borrowers, which will make it possible to close a large part of common loopholes that gave borrowers the opportunity to unscrupulously evade the repayment of loans.

In addition to the above-mentioned currently valid Laws of Ukraine, draft laws designed to settle overdue debts, create a secondary credit market and free banks from the burden of problem loans should play an important role in the restoration and development of credit relations. Yes, since 2017. the Verkhovna Rada of Ukraine is considering a draft of the Law of Ukraine "On Peculiarities of Settlement of Overdue Debts" [28], which provides for the introduction of new

rules for the settlement of overdue debts and provides for amendments to the Central Committee of Ukraine, the Criminal Code of Ukraine, the Code of Ukraine on Administrative Offenses and some other laws. As its authors emphasize, it was developed with the aim of regulating debt recovery activities of legal entities and individuals (including individual entrepreneurs), in terms of establishing methods of interaction between the creditor, the person who is directly engaged in debt collection and contacts the debtor, and the debtor, in order to ensure the protection of the rights and legitimate interests of debtors, which may be violated by the use of unscrupulous methods in the process of returning overdue monetary debt [29].

Thus, the application of the above laws and subsequently adopted draft laws will allow the banking system to get rid of a significant number of problems associated with non-performing loans and improve the quality of credit risk management of banks. At the same time, legislatively strengthening the protection of creditors' interests and proceeding from the principle of parity of parties to credit obligations, the rights of borrowers as consumers of financial services should also be properly taken into account and protected.

We can also say that the effective functioning of the mechanism for ensuring the financial stability of the bank through the coordination of decisions and the achievement of certain correspondences between all constituent components will ensure the achievement of the bank's strategic and tactical goals, will contribute to increasing the level of profitability, reducing risks, controlling and maintaining sufficient liquidity and solvency levels, which ultimately has a positive impact on ensuring the financial stability of the banking institution.

1.4. Technical and economic characteristics of JSC CB "PrivatBank"

JSC CB "PrivatBank" is one of the first private commercial banks established in Ukraine. The decision to create it was made at the founders' meeting

on February 7, 1992. And already on March 19 of the same year, the bank passed the state registration procedure. And since that moment, it has been constantly growing and developing, and now it is the undisputed leader of the market of banking services in Ukraine. [30]

Today, JSC CB "PrivatBank" cooperates with:

- 55.3% of individuals, of which almost 47% consider it their main bank;
- 63.7% of legal entities, of which 42.2% consider it their main bank;
- 73.8% of business entities are individuals, of which almost 66% consider it their main bank.

The network of banking services, which includes about 2,240 branches, more than 7,000 ATMs, 13.3 thousand payment terminals and 141 thousand trade POS terminals. The bank has issued more than 30 million payment cards, which is the majority of all issued by Ukrainian banks.

Mission JSC CB "PrivatBank": "to help the economy develop, business to grow, and private clients to realize their dreams by providing financial services of the highest quality." Slogan: "a bank for those who go forward." [30]

On the basis of license No. 22 dated 05.10.2011 the bank has the right to provide clients with the following types of banking services:

- attraction of deposits (deposits) of funds and bank metals from an unlimited range of legal entities and individuals;
- opening and maintaining current (correspondent) accounts of clients, including bank metals, and escrow accounts;

placement of funds and bank metals involved in deposits (deposits), including current accounts, on one's own behalf, on one's own terms and at one's own risk.

In order to ensure high efficiency of current activities and distribution of functions between management bodies, a corporate management system was built (Fig. 1.4) [30].

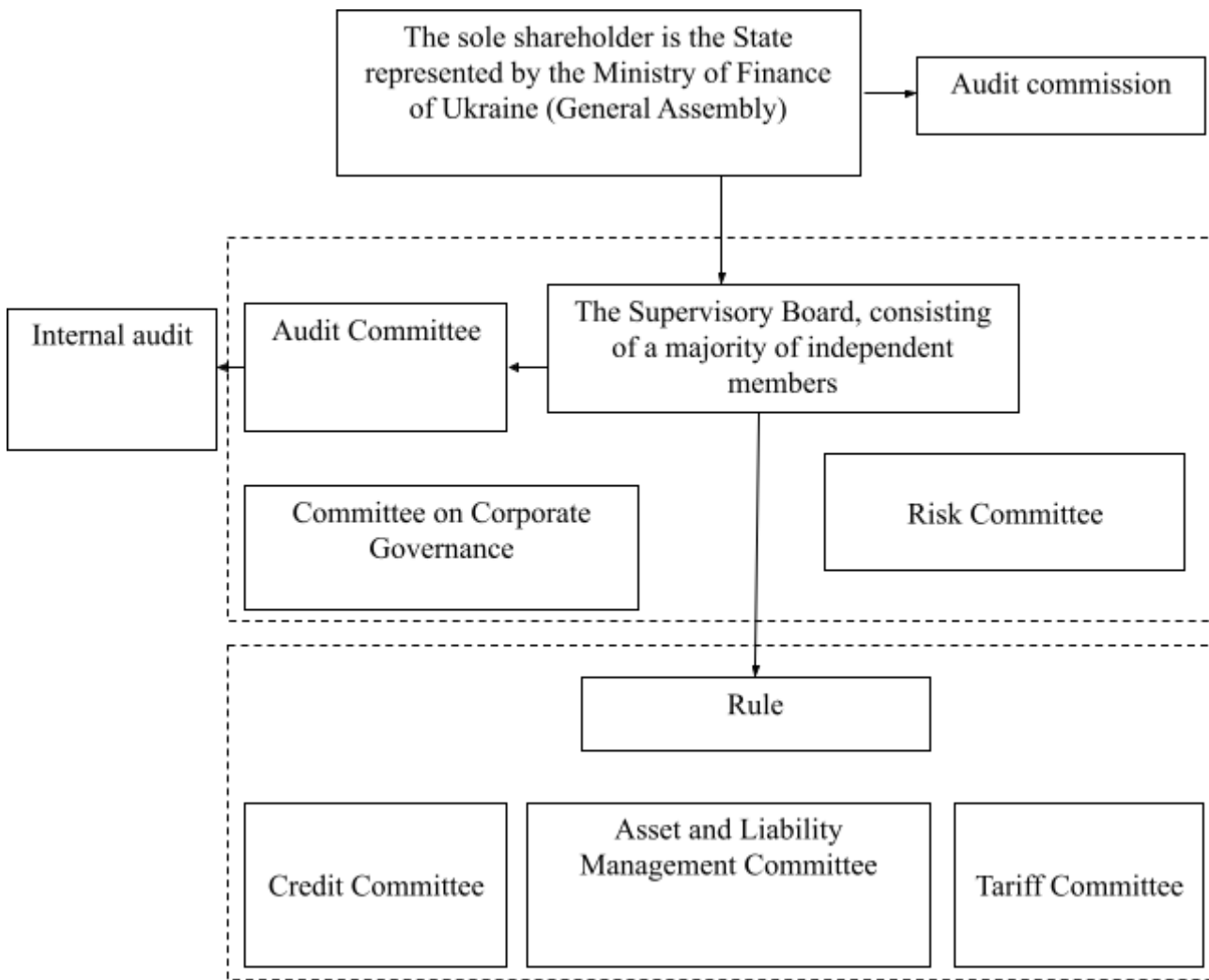


Fig. 1.4. The corporate management system of JSC CB "PrivatBank"

In addition, the bank has the right to carry out activities related to: investments, issuance of its own securities, issuance, distribution and holding of lotteries, storage of valuables, collection of funds and transportation of currency values, maintenance of registers of owners of registered securities, provision of consulting and information services regarding banking and other financial matters services

Starting from December 18, 2016, the sole shareholder of the bank, which owns 100% of the shares, is the state represented by the Ministry of Finance of Ukraine. [31]

Figures 1.5 and 1.6 [32] show the place of JSC CB "PrivatBank" in the structure of net assets and deposits of individuals in the banking system of Ukraine.

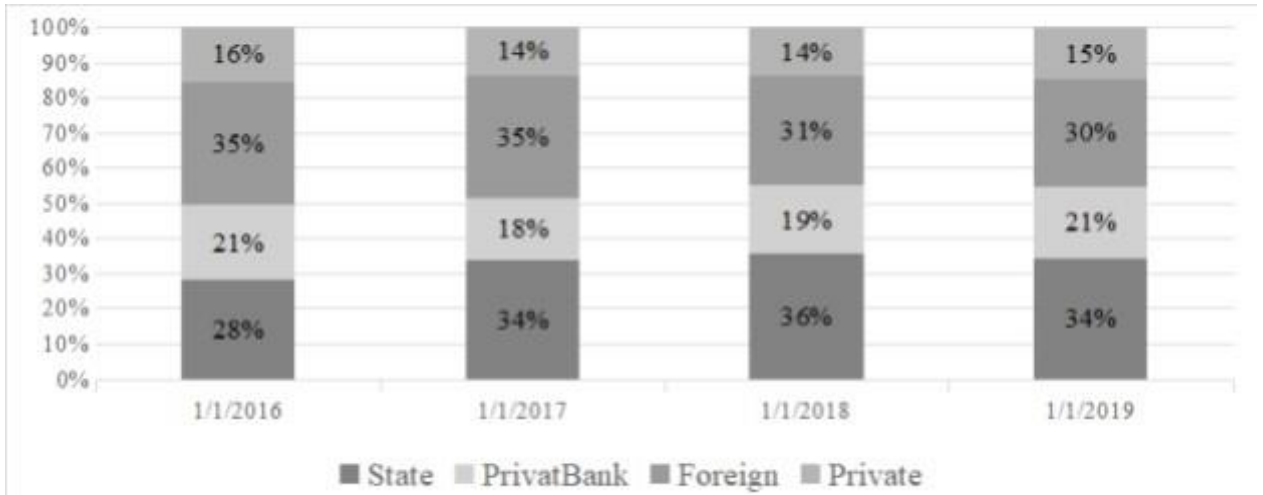


Fig. 1.5. The structure of net assets of the banking system of Ukraine

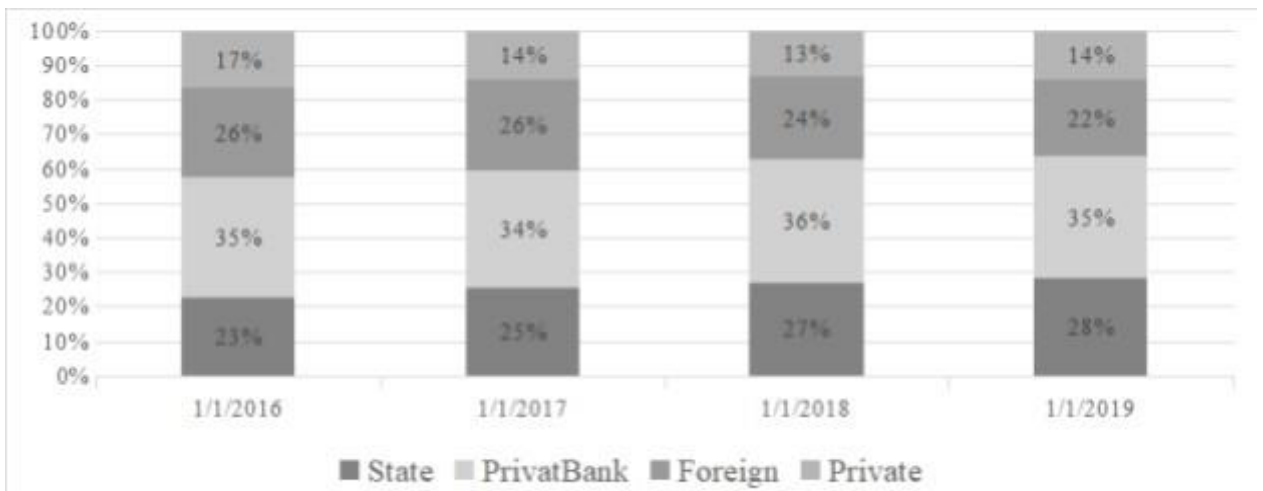


Fig. 1.6. Distribution of deposits of individuals by bank groups

Thus, the bank occupies a significant share of the Ukrainian market of banking services, and therefore, its activity affects the state of the entire banking system. Therefore, it is necessary to ensure its stability and continuous development.

Based on this, the bank developed several options for further development strategies (Table 1.5). [31]

Table 1.5

Versions of development strategies of JSC CB "PrivatBank"

Version	Key assumptions
Wide universal bank	<ul style="list-style-type: none"> - The corporate sector represents a significant growth prospect for PrivatBank, which for a long time did not adequately serve this sector - PrivatBank has opportunities to create a corporate business from scratch
Balanced growth with a selective approach to corporate clients	<ul style="list-style-type: none"> - PrivatBank can protect existing deposits and payment systems and continue growth in the personal lending market with a stable and attractive margin - A targeted presence in lending to clients of the corporate (medium-sized and SME) sector with a good risk forecast helps to further improve the position and absorb excess liquidity
Balanced growth excluding the corporate segment	<ul style="list-style-type: none"> - PrivatBank protects existing deposits and payment systems with a strong focus on reducing the cost of liabilities, continuing growth in the retail lending market - Targeted presence among SMEs and avoidance of corporate clients in order to limit the risks of losses - Avoiding corporate customers does not affect the growth opportunities of the retail sector
Balanced growth with minimal corporate segment	<ul style="list-style-type: none"> - PrivatBank protects existing deposits and payment systems with a strong focus on reducing the cost of liabilities, continuing growth in the retail lending market - A targeted presence among SMEs and minimal lending to corporate clients allows minimizing the risk of losses while effectively using excess liquidity
Reshape the framework around key liquidity and payments	<ul style="list-style-type: none"> - The market is extremely unattractive - high risk, low margins and high volatility of results - PrivatBank reduces balance sheet risks – focuses on liquidity of payments business and retail lending - PrivatBank should abandon lending with a high degree of risk, as it has limited opportunities to build lending to the currently underserved segment

Having analyzed the above options, PrivatBank JSC chose a strategy aimed at balanced growth and transformation into a bank that continues to serve individuals and selectively strengthens divisions serving small and medium-sized business and corporate clients. The key components of this strategy are:

- continue to increase the retail segment;
- activate SMEs;
- start developing the corporate segment;
- to improve the system of management and organization for the purpose of comprehensive risk management;

- launch a program to optimize operating costs.

Therefore, today JSC CB "PrivatBank" is the undisputed leader of the market of banking services of Ukraine, because it occupies a fairly significant share of it. This became possible thanks to the construction of an effective corporate management system, the development of a high-quality strategy for further development, the constant improvement of the quality of service and the introduction of a complex of modern products and services for customers.

CHAPTER 2

ANALYSIS OF CREDIT RISK MANAGEMENT IN THE SYSTEM FOR ENSURING THE FINANCIAL STABILITY OF THE BANK

2.1. Assessment of the level of credit risk management of the banking system of Ukraine to ensure its financial stability

As noted in the previous section, credit risk is the most fundamental risk for banks and financial institutions operating as a whole. The most common consequence of this risk is that it creates problems with liquidity, which is mainly related to the reduction of the credit rating of these organizations, and in the worst case it can even lead to bankruptcy or the suspension of the strategic plans of the organization.

Thus, credit risk management becomes the most controversial topic for discussion and study. To deal with credit risk, Basel II also practiced and adopted different methods of credit risk management. Basel III became an update/supplement/improvement of Basel II and, in turn, more carefully noted the need for credit risk management. The main goal of this practice was to improve the quality of credit risk management without limiting the competitiveness of banks around the world.

When assessing the level of credit risk, both of an individual bank and of the banking system as a whole, special attention should be paid to indicators that allow tracking changes in the credit portfolio of banks. The values of the key indicators of the occurrence of credit risk are given in the table. 2.1 [32-33].

According to the data (see table 2.1), it can be seen that since 2014 there is a tendency to decrease lending volumes. In our opinion, this is due to the political crisis and destabilization of the banking system. At the same time, the volume of reserves for granted loans increased significantly, which indicates active credit risk management by the banking system.

Table 2.1

Value of credit risk indicators of banks of Ukraine for 2014-2018, %

Indicators	2014	2015	2016	2017	2018
The ratio of granted loans to GDP	64.2	48.8	42,21	34.75	31,44
Specific weight of granted loans in total assets of Ukrainian banks	76.4	76.9	57.9	56.3	58,56
Ratio of reserves to granted loans	20.4	33.3	48.15	49.29	49.7
Share of overdue credit debt	13.5	22.1	55,11	54,54	52.85

An important role in assessing the level of credit risk belongs to its normative values, which aim to prevent excessive concentration of it in banks. Economic standards of the bank's activity are the basis of the system of limits established to limit and minimize credit risk in banks.

Table 2.2

Analysis of compliance by Ukrainian banks with credit risk standards for 2014-2018,

Norm	2014	2015	2016	2017	2018
Norm of the maximum amount of credit risk per counterparty (H7) (no more than 25%)	22.01	22.78	21.48	20,29	19.83
Norm of large credit risks (H8) (no more than 8 times the amount of regulatory capital)	250.04	364.14	308.27	208.31	176.23
The norm of the maximum amount of credit risk for transactions with persons related to the bank (H9) (Introduced by the Resolution of the Board of the National Bank of Ukraine dated 06/08/2015 No. 361) (no more than 25%)		31,19	36.72	17.89	10.41

During 2014-2018 there is a trend of compliance by banking institutions of Ukraine with almost all credit risk standards (Table 2.2) [34].

It should be noted that the value of standard H8 is quite far from the limit values. Norm H7 is close to the limit value of 25.0%, but was also observed during the analyzed period and has a downward trend. This may indicate that the credit risk is quite moderate, does not pose a threat to the banking system of Ukraine and is under the control of both the National Bank of Ukraine and the banks

themselves. At the same time, H9 after its introduction from 06.08.2015 to 12.31.2016. was not observed by banks, which indicates an increase in credit risk for this category of lending entities. The dynamics is observed almost until the moment of the entry into force of the Regulation of the National Bank of Ukraine "On determination by banks of Ukraine of the amount of credit risk for active banking operations" dated 30.06.2016 No. 351 [35] and as of 01.01.2019 its value is 10.41%.

The problem of non-performing loans most affects large borrowers and the largest business groups. Certain groups stop servicing their own debts, even if their financial situation improves significantly. The lack of a strong judicial system and an effective legislative mechanism for solving problems with non-performing debts form a high level of mistrust between banks and business entities. This forces banks to assess the solvency of potential borrowers extremely carefully.

However, banks are willing to lend to high-quality borrowers: according to the NBU, loans to companies that have not allowed defaults are growing at a rate of more than 20% per year [36].

In the first half of 2018, there were several important changes in the regulatory environment. The Verkhovna Rada adopted a law on the creation and maintenance of the Credit Register of the NBU.[36] According to the introduced requirements, the bank will have to classify by the worst class the debtor-individual, regarding which the Credit Register has information about the default of this debtor in other banks [24].

Also, the bank must lower the class of the debtor - a legal entity, including to the worst, if the Credit Register contains information about default or a high probability of default of this debtor in other banks.

The introduced changes will improve the quality of credit risk assessment by banks by taking into account the debtor's fulfillment of his obligations in other banking institutions, while using information from the Credit Register [37].

In addition, they began to reform corporate governance in banks, in particular, the role of independent supervisory board members was strengthened.

The National Bank publishes a Financial Stability Report every six months. Its purpose is to inform about existing and potential risks that may threaten the stability of the financial system of Ukraine. The main attention is paid to the systemic risks of the banking sector.

After studying the changes in the risk assessments of the banking system (Fig. 2.1, Fig. 2.4) [38], we can conclude that the NBU gives optimistic forecasts and most risks tend to decrease.

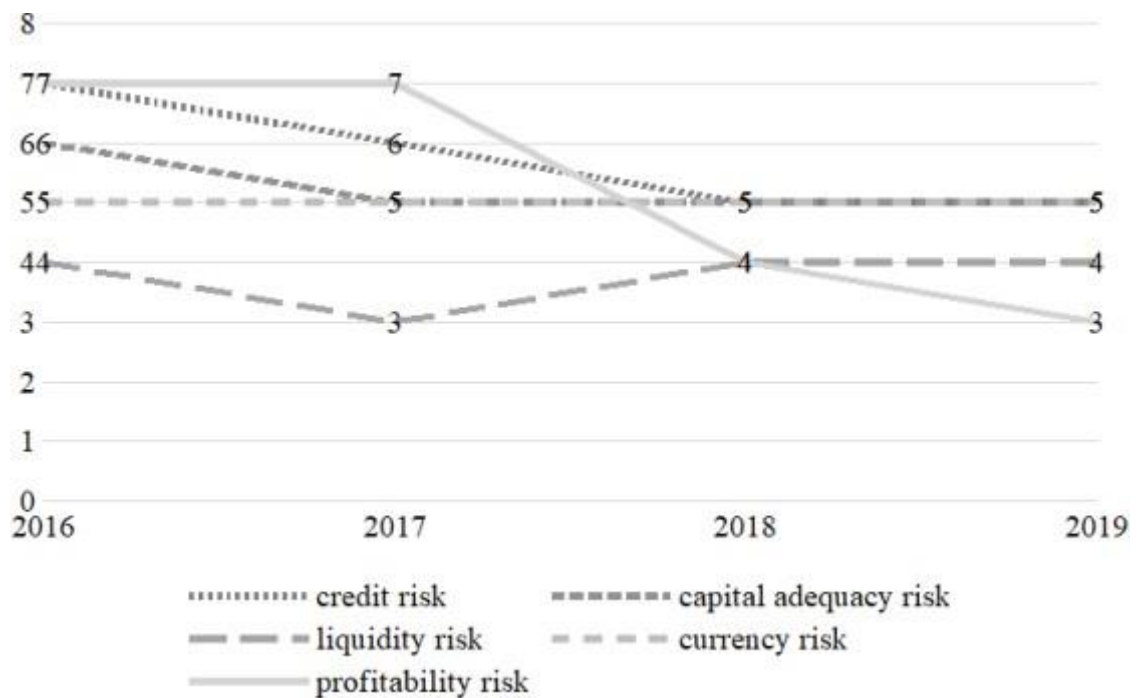


Fig. 2.1. Risk assessments of the banking system according to NBU criteria

The crisis of 2014–2016 led to an increase in the share of domestic government loan bonds in the structure of banking sector assets and the weight of state banks in it. Since the beginning of 2017, the revival of consumer lending has led to an increase in the share of net loans to individuals. The NBU believes that it will continue to grow. De-dollarization of assets is ongoing: as of the end of April 2019, the share of the currency component was the lowest in the last 10 years and will probably continue to decline. [38]

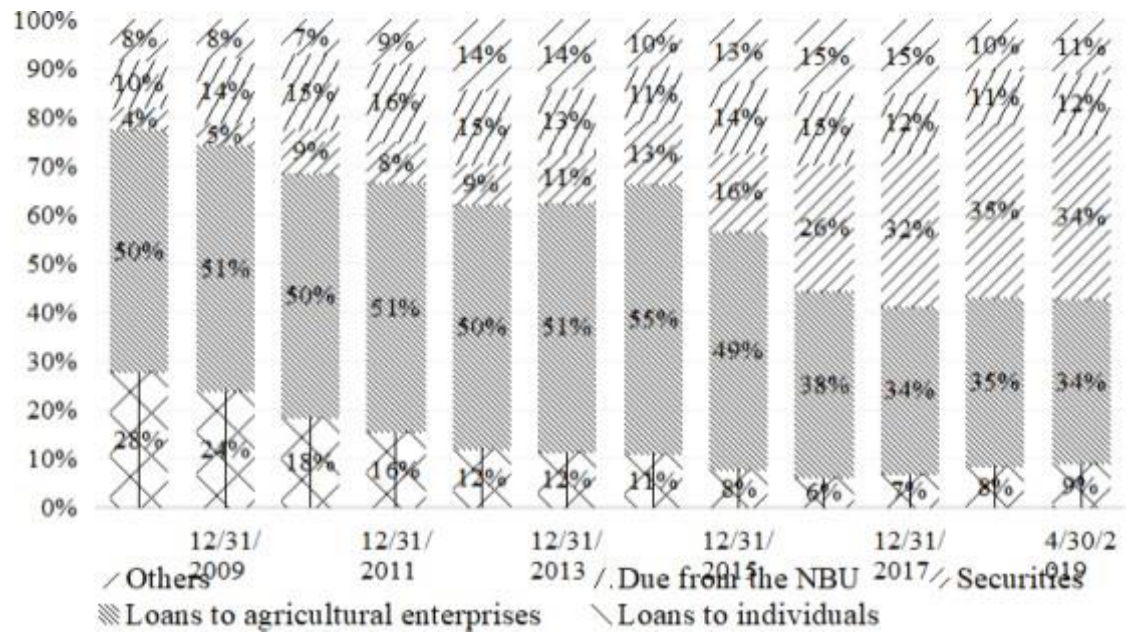


Fig. 2.2. The structure of net assets of the sector by components

In order to remain solvent after reserving non-performing loans, state-owned banks have repeatedly attracted capital from the Government in the form of government bonds. Therefore, today the investment of the banking sector in government securities already exceeds the volume of corporate loans. Their share increased from 10.8% in 2013 to 34.1% at the end of April 2019 (Fig. 2.2). Currently, 86.2% of this amount is invested in OVDP, and 11.0% in NBU certificates of deposit [38].

At the end of 2016, the share of loans to individuals reached a historic low of 6.1%, and since then, thanks to intensive consumer lending, it has increased by 3% (to 9.1%). In the next few years, the volume of loans to individuals will grow faster than other bank assets. So their share will increase.

It should also be noted that consumer lending continues to grow and remains extremely attractive for banks. It already makes up more than half of the loan portfolio of some of them. In fig. 2.3 [38] presents the banks with the largest share of consumer loans in the loan portfolio.

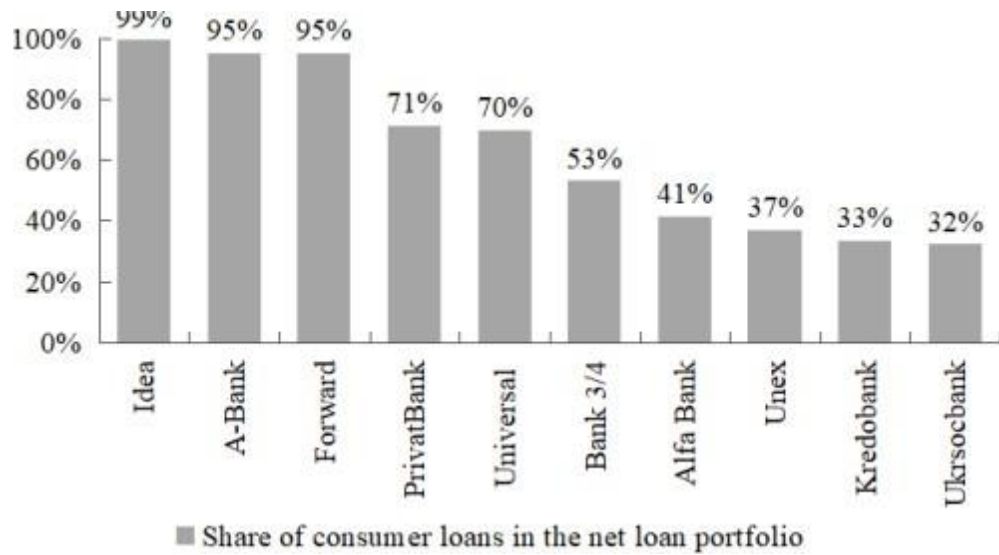


Fig. 2.3. The share of consumer loans in the net loan portfolio of Ukrainian banks

During 2018, the share of non-performing loans slowly decreased. In fig. 2.4 [38] shows the share of non-performing loans in the banking system for the period 2014-2018. Since 2016, we have seen significant changes caused by the nationalization of Privatbank. But the fact that with the growth of new retail loans by more than 35% y/y, the share of non-performing loans (NPL) is decreasing rather slowly, indicates that the quality of new loans is not high enough. At the same time, in the segment of corporate lending, the level of NPLs has hardly changed. Therefore, the work of banks on restructuring and write-off of bad loans in this segment is not very active.

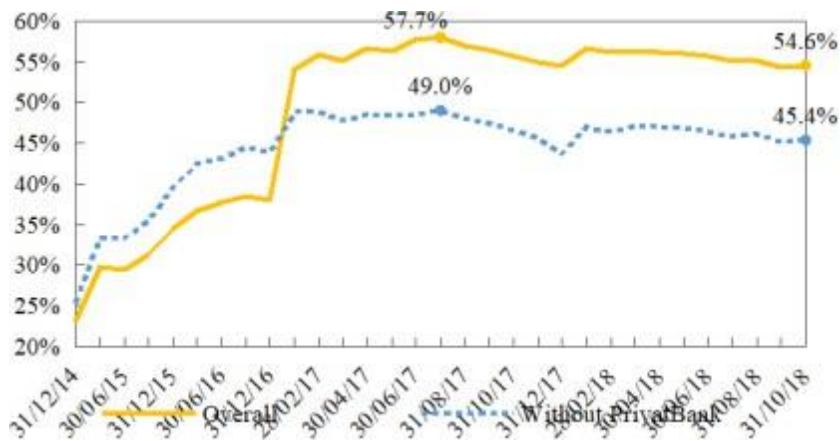


Fig. 2.4. Share of non-performing loans in Ukraine

Having studied the level of credit risk in the banking system of Ukraine, we can note that after the "cleaning" of banking institutions during 2014-2017 banks are being reformed according to new criteria from the NBU. Lending to individuals is gradually recovering, the economy is beginning to emerge from stagnation. But the issue of credit risk management remains key. After all, the growth of lending entails an increase in credit risks. Despite the improvement of the legislative framework by the state, banks should take a more detailed approach to the definition and management of individual and group credit risks.[39-40]

2.2. Assessment of the level of financial stability of the banking system of Ukraine

The level of stability of the country's banking system is one of the main indicators that potential investors pay attention to. It is a stable financial condition that can encourage both domestic and foreign investors to open a business. The state of financial stability is achieved thanks to the implementation of a set of specific measures and compliance with certain principles. In this thesis, the assessment of the level of stability of the banking system of Ukraine is carried out on the basis of the study of the following indicators:

- the dynamics of the number of banks. This indicator makes it possible to draw conclusions about the presence of "toxic" banks in the banking system, about the state's response to the presence of such banks;

- the work of the Deposit Guarantee Fund of individuals. The quality of the fund's performance of its functions can tell about the relevance of the tools, and the attitude of the borrowers regarding the confidence in saving their funds;

- share of non-performing loans. This indicator indicates the volume of credit risks in the banking system, the size of credit rates. The greater the number of non-performing loans, the more difficult it is for borrowers to simultaneously

conduct profitable activities and repay loans.

As of 01.01.2019 76 financial and credit institutions are included in the State Register of Banks, of which the number of banks with 100% foreign capital is 24, with the participation of foreign capital - 12 [37].

In the last 3 years, there has been a rapid reduction in the number of operating banking institutions (Fig. 2.5) [37].

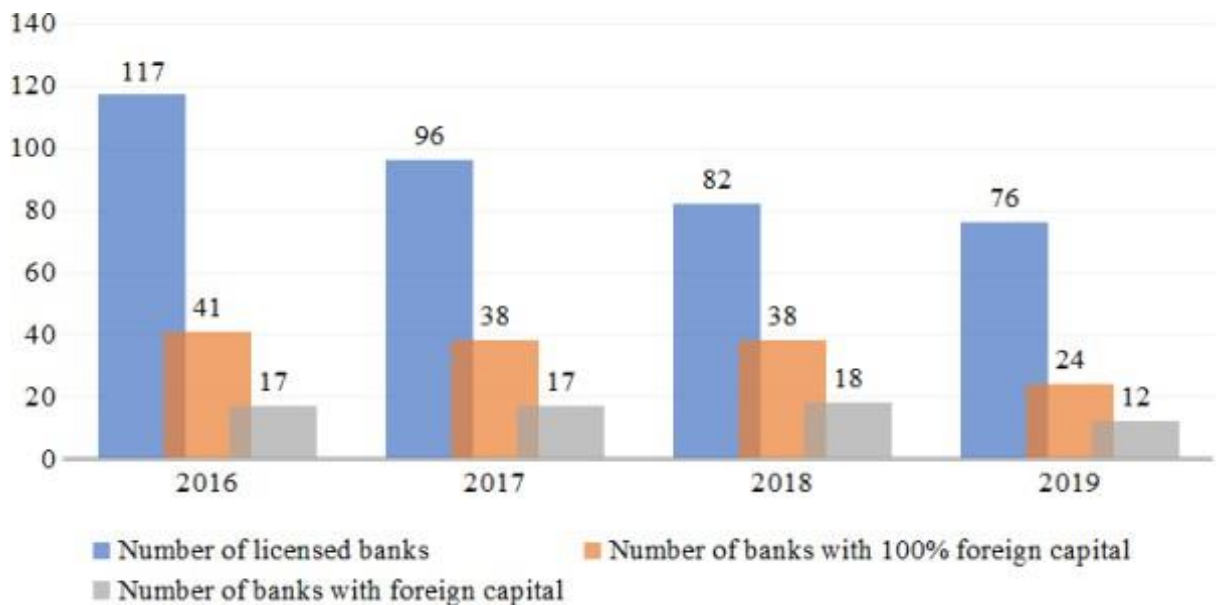


Fig. 2.5. Dynamics of the number of banks for the period 2016-2019

Today, the Individual Deposit Guarantee Fund is conducting liquidation work at 74 banks. Most banks in a state of liquidation began to be removed from the market in 2014-2015, and payments to depositors of these financial and credit institutions continue to this day. This indicates the high workload of the Fund.

Although it performs its main functions at a high level, if we take into account the conditions in which it performs its activities [37]. This is evidenced even by the fact that in 2017, by managing the assets of liquidated commercial banks, they received a profit of 7.733 billion. UAH., including:

- 4.058 billion UAH - from the sale of assets;
- 3.424 billion hryvnias.. – from repayment of loans;

- 0.157 billion UAH - from redemption of securities;
- 0.094 billion UAH - from rent [38].

This is primarily due to the economic crisis that has engulfed our country in recent years, as well as military and political events that, unfortunately, continue today.

It is also worth noting that a significant reason for the "bank collapse" can be considered a change in the leadership and direction of the Board of the National Bank of Ukraine.

Over the past three years, a large number of systemic problems in the banking sector of Ukraine have been resolved. The cleanup of the banking system is almost complete, and new key issues are coming to the fore that also require immediate resolution.

The main systemic risks of the financial sector today are a high share of the state in the banking sector and the level of non-performing loans throughout the system [37].

A high share of non-performing loans (57% as of October 1, 2018) [37] is a ballast for banks' balance sheets. Full provisioning and write-off of such loans would be a sensible step, as most of these loans will never be serviced again. Therefore, making changes to the legislation will help reduce negative tax consequences for banks. Financial institutions should more actively restructure loans to borrowers whose financial condition is recovering. Banks should use the institute of financial restructuring. [37].

You can follow the dynamics of non-performing loans in fig. 2.6 and fig. 2.7 [37].

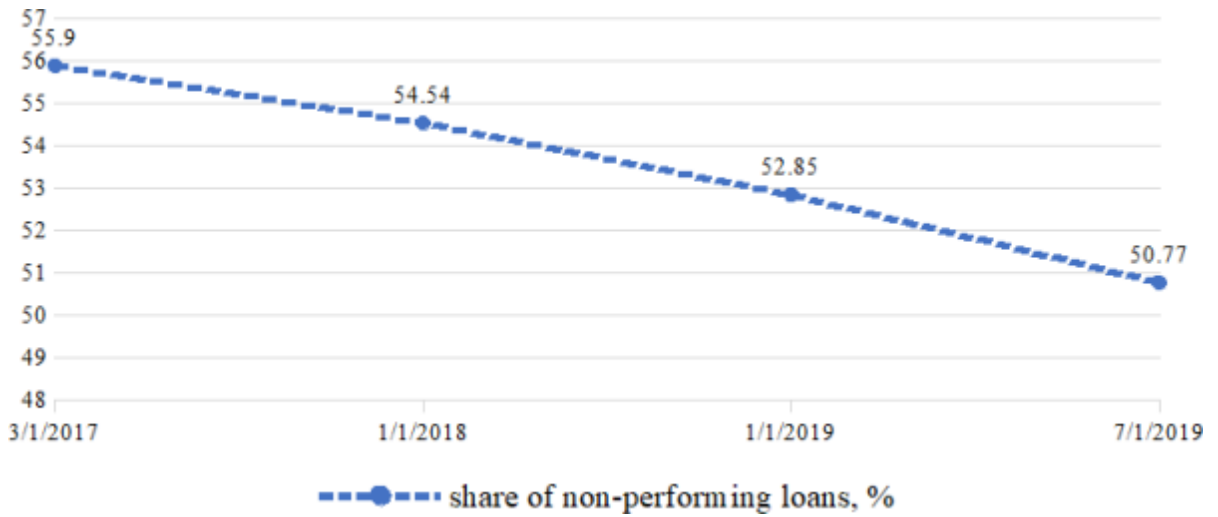


Fig. 2.6. The share of non-performing loans in the banking system of Ukraine

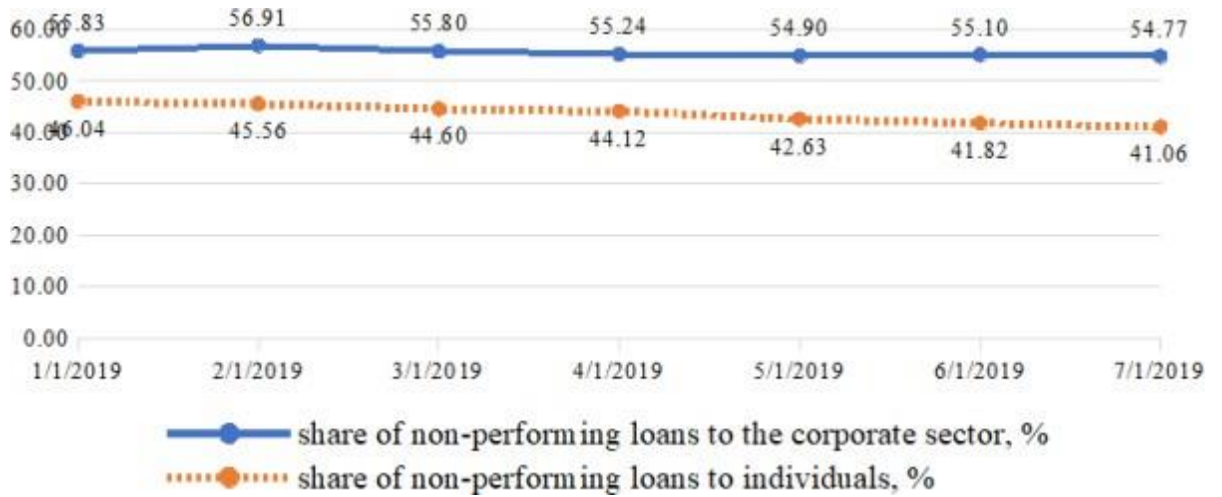


Fig. 2.7. Share of non-performing loans in the banking system of Ukraine by types of counterparties

This situation describes the activity of banks aimed at more thorough work with problem loans of individuals and individual entrepreneurs.

The characteristics of the risks of the banking sector of Ukraine are given in the table. 2.3 [38].

Table 2.3

Characteristics of the risks of the banking system of Ukraine in 2019

The name of the risk	Characteristic
Credit risk	The relative debt burden on the population is low. Most of the loans are unsecured consumer loans with extremely high effective rates. New consumer lending is characterized by high payment discipline. Credit risks in the corporate sector are declining slowly, having improved significantly since the crisis. The market still lacks high-quality borrowers
Capital adequacy risk	In general, the sector is adequately capitalized: most banks have enough capital even in the event of a crisis. However, in some state banks, capital adequacy is close to the permissible minimum. This year's stress testing of 29 banks will make it possible to update the assessment of the level of capital adequacy in the sector.
Liquidity risk	Personal funds flow to banks at a high rate. But the short maturity of liabilities is still a risk factor for the sector. However, since banks adhere to the new LCR liquidity standard (most with a significant margin), they are guaranteed to be able to fully meet their obligations even in stressful conditions.
Legal risk	A number of high-profile court decisions in cases concerning the transfer of Privatbank to state ownership creates additional risks. If the decisions are confirmed, high risks will remain for a long time, which will threaten to reduce public and business confidence in banks
Currency risk	Currency risk is associated with a high level of dollarization of banking sector assets and liabilities. Open currency positions of banks currently do not create significant risks for them. Exchange rate fluctuations are moderate. The NBU does not expect turbulence on the foreign exchange market if cooperation with the IMF is quickly restored.
Profitability risk	Today, the profitability of the sector exceeds the previous expectations of the NBU, operating profits are growing rapidly, and deductions to reserves are quite low. It is expected that the high profitability will continue in the following quarters. The operational efficiency of state-owned banks improved somewhat.

Thanks to the slow decline in interest rates on business loans, there is a slight decrease in the share of non-performing loans for this segment. However, it can be concluded that it is quite difficult for businesses to conduct profitable activities and timely settle their obligations to banks.

Based on the above, we can conclude that the NBU has positive forecasts regarding the general state of risks in the banking system. However, we consider it necessary to study the indicators of financial stability for 2016-2018.

Table 2.4

Indicators of financial stability of the banking system for 2016-2018

Indicator	2016	2017	2018
The ratio of regulatory capital and risk-weighted assets (H2) is at least 10%	12.69	16,10	16,18
Ratio of Tier 1 regulatory capital to risk-weighted assets	8.96	12,12	10.52
The ratio of non-performing loans to total gross loans	30,47	54,54	52.85
The rate of return on assets is at least 1%	-12.47	-1.76	1.60
Rate of return on capital at least 15%	-122.17	-15.34	14.61
Ratio of interest margin to gross income	45.94	50.20	52.02
The ratio of non-interest expenses to gross income	60,91	76,14	61.92
The ratio of liquid assets to total assets	48.53	53.94	51,14
The ratio of liquid assets to short-term liabilities (H6) is at least 60%	92.09	98.37	93.52
Ratio of net open position in foreign currency and capital	118.88	89.61	134.77

As can be seen from the data in the table. 2.4 [38], the ratio of non-performing loans to total gross loans as of January 1, 2019 was almost 53%, but this indicator is lower than the previous year – 54.5%. The appearance of problem assets in the banking system was caused by the devaluation of the hryvnia. This led to a nominal recalculation of problem loans and a decrease in the real financial condition of borrowers. The annexation of Crimea and the ban on the activities of banks in the territory of Crimea and ATO left their mark. Revival of activity in the foreign currency lending segment increases the risk of losses for banks, due to the lack of foreign currency resources.

Research conducted by the National Bank of Ukraine showed that today the banking sector of Ukraine is exposed to certain systemic risks. If necessary, the NBU will resort to macroprudential response measures. The main such risks include a short funding period for banks, a significant level of dollarization of the banking sector, a high share of state capital in the banking sector, rapid growth in consumer lending, the flow of assets and operations to the non-banking financial sector, and a high concentration of credit risks. The characteristics of the main macroprudential instruments used by the NBU are presented in the table. 2.5 [41].

Table 2.5

Macroprudential instruments in Ukraine

Tools	Characteristic
Capital instruments	
Capital conservation buffer	It is formed in a non-stressful period to cover losses and prevent violation of the minimum capital adequacy requirements in the future. Activation is foreseen in 2020, the buffer will be 0.625% with a gradual increase to 2.5% by early 2023.
Countercyclical buffer	It is activated during periods of credit expansion, decreases or is deactivated during periods of economic decline. Reduces the procyclicality of the financial system. Depending on the phase of the economic cycle, it can vary from 0% to 2.5%.
System importance buffer	Strengthens the stability of systemically important institutions. It is established depending on the category of system importance of the bank from 1% to 2%.
Systemic risk buffer	Reduction of vulnerability to long-term structural (non-cyclical) systemic risks. Today, this buffer is not provided for by the NBU regulations.
Leverage ratio	The minimum ratio of first-tier capital to all assets (on-balance sheet and off-balance sheet), not weighted by risk. It is planned to be introduced in the future, the minimum level has not been determined.
Additional risk weights for certain types of loans	Increasing the amount of capital to cover possible losses for certain types of loans. Could potentially apply to foreign currency loans in the future
Liquidity instruments	
Liquidity coverage ratio	Determines how much high-quality liquid assets a bank must hold to cover net outflows for 30 days during a crisis period. Introduced in December 2018.
Net stable funding ratio	Determines the minimum share of stable (long-term) funding depending on the liquidity and residual maturity of assets. Encourages banks to refocus on long-term sources of financing. Implementation is planned in 2020.
Other tools	
The marginal ratio of the size of the loan and the cost of collateral	Limits the maximum amount of credit to households depending on the value of the collateral. It is most often applied to mortgage loans, prevents the emergence of "bubbles" in the real estate market. It is unlikely to be used as a hard restriction in the coming years, but it is possible to publish recommendations to banks.
The marginal ratio of the amount of debt service and the borrower's income or the total amount of credit and income	Limit the maximum amount of credit that a household can receive, depending on the level of its income. Prevent excessive growth of lending and indebtedness of households. It is unlikely to be used as a hard restriction in the coming years, but it is possible to publish recommendations to banks.
Increased requirements for information disclosure	The tool increases public awareness of the activities of financial institutions, increasing the stability of the financial system.

In turn, the banking system expects from the National Bank of Ukraine

constant monitoring, analysis and assessment of the mutual influence of micro and macro factors on the banks' activities, as it is very sensitive to internal negative destabilizing factors and fluctuations in the world economy.

Thus, we note that the financial stability of the banking system of Ukraine as a whole is gradually improving, as evidenced by the results of the analysis carried out in this section of the qualifying master's thesis. Of course, we cannot say that it is stable today, but the fact that the banking sector feels much better than in the period from 2013 to 2015 is obvious. Therefore, constant monitoring and regulation of the activities of banking institutions will ensure the stable functioning of the banking system of Ukraine.

2.3. Calculation and assessment of the level of credit risk at PrivatBank CB JSC

Studying the works of scientists on credit risk management [9-16], we can come to the conclusion that the main parameters of the bank's loan portfolio are profitability and risk. The ratio of these indicators determines the effectiveness of the bank's credit strategy and general credit activity. The main goal of the bank's loan portfolio management process is to ensure maximum profitability at an acceptable level of risk.

For the calculation, the model for assessing the risk of the bank's loan portfolio was considered and modernized [42].

We propose to carry out risk assessment of the credit portfolio in three stages. The first stage consists in the use of certain indicators of the level of credit risk - indicators that are directly related to the occurrence of credit risk. As indicators of the risk level of the credit portfolio, we suggest using the following indicators:

1. C1 is the coefficient of credit activity. Reflects the share of the bank's loan portfolio in total assets and is calculated according to the formula:

$$, (2.1)C_1 = \frac{LP}{A} \times 100\%$$

where LP is the bank's loan portfolio; A - total assets of the bank.

It is known that the bank's credit policy is passive if the volume of lending is less than 65%, while if the share exceeds 75%, then the credit policy is aggressive [42]. However, the bank independently sets the limits of this indicator depending on the type of credit strategy chosen by it.

2. C2 – reserve adequacy ratio. Testifies to the degree of adequacy of the bank's reserves in case of non-repayment of loans and is calculated according to the formula:

$$, (2.2)C_2 = \frac{R}{LP} \times 100\%$$

where R is a reserve created for compensation of losses on credit transactions.

The optimal value of this indicator is considered to be within 0.9 - 5% [42].

3. C3 – loan quality ratio. It characterizes the specific weight of bad loans in the total amount of loans and is calculated according to the formula:

$$, (2.3)C_3 = \frac{BL}{LP} \times 100\%$$

where BL are loans classified as bad.

The lower the value of this indicator, the higher the quality of the credit portfolio. The value of the coefficient should not exceed 5%.

4. C4 – ratio of overdue loans. It characterizes the share of overdue loans in the total volume of loans. It is calculated according to the formula:

$$, (2.4)C_4 = \frac{OL}{LP} \times 100\%$$

where OL - loans overdue for more than 30 calendar days, according to the regulations of the NBU.

The specific weight of overdue loans in the total amount of the loan portfolio should not exceed 10% [42].

5. C5 – the maximum amount of risk per borrower (or a group of related borrowers). It is determined in accordance with the procedure established for the calculation of the mandatory standard H7 "Standard of the maximum amount of credit risk per counterparty". The normative value of H7 should not exceed 25% [37].

6. C6 – the level of concentration of large credit risks, determined according to the procedure established for the calculation of the mandatory standard H8 "Standard of large credit risks". The normative value of H8 should not exceed 8 times the size of the bank's regulatory capital [37].

7. C7 – the level of concentration of credit risks per one insider is determined in accordance with the procedure established for the calculation of the mandatory norm H9 "The norm of the maximum amount of loans, guarantees and sureties provided to one insider". The normative value of H9 should not exceed 5% [37].

8. C8 is the ratio of loans written off from the reserve. It characterizes the specific weight of written-off bad loans, actually lost for the bank and is calculated according to the formula:

$$, (2.5)C_8 = \frac{WR}{LP} \times 100\%$$

where WR is a write-off from the reserve created to compensate for losses on the bank's credit operations.

The optimal value for this indicator is 0.25 - 1.5% [43].

9. C9 is the profitability ratio of credit operations. Provides an opportunity to assess the profitability of the bank's loan portfolio and is calculated according to the formula:

$$, (2.6)C_9 = \frac{II-IE}{3} \times 100\%$$

where II is the bank's interest income; IE - interest expenses of the bank.

The optimal value of this indicator should not be lower than 1.4% [42]. As the upper limit value of such an indicator, we take its maximum value for the last five years in the banking system of Ukraine as a whole, which is 7.4% [42].

Limits (threshold values) are set for each indicator, which will ensure the identification of credit risks significant for the bank and a timely and adequate impact on them. So, since each of the C_i indicators ($i = 1, 2, \dots, 9$) has an upper and lower limit value, we denote the lower value of the K_i indicator as LB_i , and the upper one as UB_i .

Thus, we have identified 9 indicators on the basis of which it is advisable to carry out the first stage of credit risk assessment. At this stage, we calculate the values of the main (objective) indicators that characterize credit risk.

The higher the value of the C1, C3 - C8 coefficients, the higher the risk level of the bank's loan portfolio. Indicators C2, C9 have a certain optimal value, which is indicated in the relevant scientific works.

According to the proposed model, for coefficients C1, C2, C9, the optimal value is in the range from $LB > 0$ to UB. For coefficients C3 - C8, the lower limit (LB) is equal to 0, and the upper limit (UB) is the maximum permissible value. Also, the proposed model makes it possible to change the set of indicators and add others, if the economic, political or legal situation requires such changes.

At the second stage of credit risk assessment, a point risk assessment is performed, which is necessary for determining the integral credit risk indicator in the future. The maximum number of points (90) is assigned to the critical value of

the indicator, and in the case of a range of critical values - to the extreme value of the range.

We suggest calculating the points based on the actual value of the indicator as follows: if the ratio is lower (higher) than the critical value, we add (subtract) points. If we have a case when the critical value is in the range of values, the fraction (in percent) that cuts off the calculated value from the range is added to it, and subtracted - in the case of falling outside the range.

At the third stage, the integral risk indicator and the degree of credit risk are determined. The integral indicator of credit risk (ICR) is defined as the sum of points weighted by weighting factors,

$$I_{cr} = \sum_{i=1}^n R_i \times l_i$$

(2.7)

where R_1, R_2, \dots, R_n are indicators of the calculated number of points;
 l_1, l_2, \dots, l_n - weight of indicators; n is the number of indicators.

The weight of each indicator is determined by the degree of its influence on the aggregate credit risk. In our opinion, it is appropriate to use the method of expert assessments to determine the weight of credit risk indicators. The main advantage of this method lies in the possibility of application in cases of lack of information. A necessary condition for high-quality expert evaluation is the involvement of specialists with a high professional level and significant experience in the field of banking [44].

To determine the weight of the indicators, a group of experts is asked to rank nine factors that determine the weight of the indicators, according to the principle: the indicator that has the greatest impact on the overall risk of the credit portfolio is 9; the indicator that affects the least is equal to 1, the ranks are not repeated. The null hypothesis is: $H_0 =$ "experts' opinions are agreed", as an alternative: $H_1 =$ "experts' opinions differ significantly".

The weighting factors (l) are calculated according to the formula:

$$l_j = \frac{S_j^{(R)}}{S_{full}} = \frac{\sum_{i=1}^m d_{ij}}{\sum_{j=1}^n \sum_{i=1}^m d_{ij}}, \quad (2.8)$$

where d_{ij} is the rating given by the i -th expert to the j -th indicator(,;)

$$\bar{i} = \overline{1, m} \quad \bar{j} = \overline{1, n}$$

m is the number of ranked ranks, that is, the number of experts;

n – the number of ranking objects, that is, the number of indicators;

$S_j^{(R)}$ – the sum of ranks for the j -th indicator;

S_{povn} - the full sum of ranks.

The concordance coefficient (W) is used to assess the degree of consistency of experts' opinions. The concordance coefficient is calculated according to the formula:

$$, (2.9) W = \frac{S}{S_{max}}$$

where S is a variation relative to the average rank;

S_{max} is the maximum value of the variation.

The maximum value of the variation is calculated by the formula:

$$, (2.10) S_{max} = \frac{1}{12} m^2 (n^3 - n)$$

The coefficient of variation relative to the average rank is calculated by the formula:

$$, (2.11) S = \sum_{j=1}^n \left(s_j^{(R)} - a \right)^2$$

where a is an indicator of the average sum of ranks.

The indicator of the average sum of ranks (a) is calculated according to the formula:

$$(2.12)a = \frac{1}{2}m \times (n + 1)$$

The concordance coefficient takes a value from 0 to 1. The higher the concordance coefficient value, the higher the degree of consistency of experts' opinions. When $W=1$, there is complete agreement of experts' opinions; if $W=0$, then consistency is practically absent. The degree of consistency of experts' opinions is considered acceptable if $W > 0.5$ [45].

Having studied the literature [43-49], we can come to a conclusion about the degree of risk of the bank's loan portfolio. The integral indicator of credit risk $I_{kr} = 90$ corresponds to the indicators of the bank's activity, which are equal to the established critical limits of the limit values. The greater the value of the indicator exceeds the limit of 90 points, the lower the degree of risk observed in the bank, and vice versa. It is advisable to use the calculation of the integral indicator to assess credit risk in dynamics. Comparing the results of the assessment of this indicator over several periods, it is possible to draw a conclusion about the tendency to change the level of the bank's credit risk.

It is advisable to use the calculation of the integral indicator of credit risk to assess credit risk in dynamics. Therefore, we will evaluate this indicator for three years - 2016, 2017 and 2018, and based on this we will draw a conclusion about the dynamics of credit risk in the bank.

At the first stage, we calculate the values of the main risk indicators of the bank's loan portfolio.

Appendix E shows the calculated values of these indicators for 2016-2018. At the same time, we will introduce the conventional designations of the following indicators:

LP – loan portfolio of the bank;
 A – total assets;
 R – reserve created for compensation of losses on credit operations;
 BL - bad loans;
 OL – loans overdue for more than 30 calendar days;
 WR - write-off from the reserve created to compensate for losses from the bank's credit operations;
 II – interest income of the bank;
 IE - interest expenses of the bank.

Data from the bank's financial statements for 2016-2018 were used to calculate the above indicators. The initial data for calculating indicators are given in table. 2.6 [31, 34].

Table 2.6

Source data for calculating the credit risk indicators of the JSC CB "PrivatBank" bank

Indicator	2016	2017	2018
Total assets (million hryvnias)	179833	253740	278120
Loan portfolio (million hryvnias)	227923	237181	291936
Reserve for credit risks (million hryvnias)	195308	198846	241796
Bad loans (million hryvnias)	206498	202870	244417
Overdue loans (million hryvnias)	1350	1725	1562
Standard H7, (%)	14,22	5.7	6.26
Standard H8, (%)	119.35	0	0
Standard H9, (%)	2.5	1.3	0.67
Write-off from the reserve (million hryvnias)	949	5864	25
Interest income (million hryvnias)	31560	24485	30754
Interest expenses (million hryvnias)	29479	18373	16758

At the second stage of credit risk assessment, a point assessment of each calculated risk indicator is performed according to the algorithm developed by us. Depending on whether the calculated indicator falls within the range of the optimal value, its scoring is carried out according to one of four formulas:

$$, (2.13)R_i = 100 - 100 \times \left(1 - \frac{K_i}{LB_i}\right)$$

$$, (2.14)R_i = 100 - 100 \times \left(1 - \frac{UB_i}{K_i} \right)$$

$$, (2.15)R_i = 100 + 100 \times \left(1 - \frac{i}{UB_i} \right)$$

$$, (2.16)R_i = 100 + 100 \times \left(1 - \frac{|2 \times K_i - (LB_i + UB_i)|}{(UB_i - LB_i)^i} \right)$$

where R_i is an indicator of the calculated number of points;

LB_i is the lower limit of the optimal value of the risk indicator;

UB_i is the upper limit of the optimal value of the risk indicator.

Formula 2.13 is used to calculate the score of C8 indicators in 2018 and C9 in 2016;

formula 2.14 – for indicators C1 (2016-2018), C2 (2016-2018), C3 (2016-2018), C8 in 2017;

formula 2.15 – for indicators C4 (2016-2018), C5 (2016-2018), C6 (2016-2018), C7 (2016-2018);

formula 2.16 is used for C (2016), C9 (2017-2018).

We carried out the calculation of points for each indicator in 2016-2018, and the results of the calculation of points for risk indicators are shown in the table.

2.7. [31]

Table 2.7

Point assessment of credit risk indicators of JSC CB "Privatbank"
in 2016-2018

Indicator	Number of accrued points		
	2016	2017	2018
Credit activity ratio (K1)	59.2	80.2	71.5
Reserve adequacy ratio (K2)	5.8	6.0	6.0
Loan quality ratio (K3)	5.5	5.8	6.0
The ratio of overdue loans (K4)	194.1	192.7	194.6
The maximum amount of risk per borrower (K5)	143.1	177.2	175.0
Level of concentration of large credit risks (K6)	80.7	200.0	200.0
The level of concentration of credit risks per insider (K7)	190.0	194.8	197.3
Coefficient of withdrawals from the reserve (K8)	127.2	60.7	3,4
Profitability ratio of credit operations (K9)	82.7	102.0	107.4

The weighting coefficients of indicators are established by the method of expert evaluations. The experts' assessments are given in the table. 2.8.

To assess the degree of consistency of experts' opinions, we calculate the concordance coefficient (W) according to formula 2.9:

$$S_{max} = \frac{1}{12} \cdot 15^2 \cdot 3 = 13500$$

The coefficient of variation relative to the average rank is calculated according to formula 2.11.

Table 2.8

Experts' assessments of the impact of indicators on aggregate credit risk

Expert	Evaluation of experts, dij									Sum
	C1	C2	C3	C4	C5	C6	C7	C8	C9	
1	8	6	9	5	7	1	2	3	4	45
2	9	4	7	5	6	1	2	3	8	45
3	8	6	7	4	9	2	1	3	5	45
4	8	6	9	4	7	1	2	3	5	45
5	7	5	9	6	8	1	2	3	4	45
6	8	6	9	5	3	1	2	7	4	45
7	9	6	8	5	4	1	2	3	7	45
8	8	6	9	5	7	2	1	3	4	45
9	8	5	9	6	7	1	2	3	4	45
10	8	6	9	5	7	1	2	3	4	45
11	8	6	9	5	7	1	2	3	4	45
12	9	7	5	8	4	3	6	1	2	45
13	7	6	8	5	9	1	2	3	4	45
14	8	6	9	5	7	1	2	3	4	45
15	8	3	9	5	7	2	1	4	6	45
Sum of ranks, $s_j^{(R)} = \sum_{i=1}^{15} d_{ij}$	121	84	125	78	99	20	31	48	69	675
Total rank	8	6	9	5	7	1	2	3	4	-
Deviation of the sum of ranks from a, $S_j^{(R)} - a$	46	9	50	3	24	-55	-44	-27	-6	-
Squares of deviations, $(S_j^{(R)} - a)^2$	2116	81	2500	9	576	3025	1936	729	36	11008

We calculate the average sum of ranks (a) according to formula 2.12:

$$a = \frac{1}{2} 15 \times (9 + 1) = 75$$

From the data (see Table 2.7) it can be seen that the coefficient of variation relative to the average rank (S) is 11008. Let's calculate the concordance coefficient:

$$W = \frac{11008}{13500} = 0,82$$

The value of the concordance coefficient calculated by us is 0.82, and therefore this is more than enough to accept the H0 hypothesis about the agreement of experts' opinions.

Based on the results of the expert assessment, we will calculate the values of the weighting coefficients for the credit risk indicators, which are necessary for calculating the integral indicator of the bank's credit risk. The weighting factors (l) are calculated according to the formula. According to the results of calculations, the total number of ranks is $S_{full} = 675$.

Therefore, the weighting coefficients of the indicators have the following values (Table 2.9).

Table 2.9

The value of the weighting coefficients of credit risk indicators

Experts	Indicators									Sum
	C1	C2	C3	C4	C5	C6	C7	C8	C9	
Weight coefficients, l	0.179	0.124	0.185	0.116	0.147	0.030	0.046	0.071	0.102	1

Having calculated the score for each risk indicator and the weighting coefficients of these indicators, we can calculate the integral credit risk indicator (ICR) and draw a conclusion about the degree of credit risk in the bank.

Let's calculate the value of the integral credit risk indicator of the JSC CB "PrivatBank" bank for 2016, 2017 and 2018. To do this, we will assume that the experts' assessments of the weight of each indicator remained unchanged during these three years. The calculation of Ikr is given in the table. 2.10.

The total amount of points calculated for the indicators, weighted by the weighting factors, makes up the integral indicator of credit risk. In 2016, Ikr was 84.5 points; in 2017 – 94.2 points; in 2018 – 89.2 points.

Therefore, based on the results of the evaluation of the integral indicator, it can be concluded that since 2016 the bank improved the quality of credit risk management. But for 2018 the value did not reach 90 points, from which we can conclude that Privatbank does not comply with the regulatory limits of the above indicators. Thus, the bank is exposed to credit risks, and management should pay more attention to the issue of credit risks.

Table 2.10

Calculation of the integral indicator of credit risk in 2016-2018

Indicator	Weight	2016		2017		2018	
		Scored points	Weighted scores	Scored points	Weighted scores	Scored points	Weighted scores
C1	0.179	59.2	10.6	80.2	14.4	71.5	12.8
C2	0.124	5.8	0.7	6.0	0.7	6.0	0.7
C3	0.185	5.5	1.0	5.8	1.1	6.0	1.1
C4	0.116	194.1	22.5	192.7	22.4	194.6	22.6
C5	0.147	143.1	21.0	177.2	26.0	175.0	25.7
C6	0.030	80.7	2.4	200.0	6.0	200.0	6.0
C7	0.046	190.0	8.7	194.8	9.0	197.3	9.1
C8	0.071	127.2	9.0	60.7	4.3	3,4	0.2
C9	0.102	82.7	8.4	102.0	10.4	107.4	11.0
Sum	1	888.3	84.5	1019.4	94.2	961.2	89.2

In addition, based on the activities of the domestic banking sector, we can offer a number of the following measures to optimize the bank's credit risk management:

1. Improvement of risk management policy. It should include measures to overcome negative situations and mitigate the consequences of those that cannot be

fully predicted. The bank's credit committee must consider only credit applications that comply with the approved risk management policy.

2. Development of the internal system of bank limits. They should ensure the diversification of the banking institution's credit portfolio by terms, industries, lending entities, types of loans, territories and other factors.

3. Collection of information about credit risk and use of its assessment system, which includes:

- development of a system of quantitative and qualitative indicators for significant risk factors;
- determination of optimal and critical values for each credit risk factor in particular and in general;
- development of bank standards regarding credit quality and compliance with requirements established by regulatory bodies.

4. Creation of a credit risk monitoring system in real time using special computer programs for accounting and data analysis.

Thus, we consider it expedient to conduct an assessment of the level of credit risk management of JSC CB "PrivatBank" in dynamics. At the same time, the proposed model makes it possible to add or exclude indicators affecting the level of credit risk. The conducted research showed that the level of credit risk management at Privatbank is satisfactory, but requires significant attention. The application of the above-mentioned tools should improve the level of credit risk management of JSC CB "PrivatBank".

CHAPTER 3

DIRECTIONS OF IMPROVING THE CREDIT RISK MANAGEMENT SYSTEM FOR ENSURING THE FINANCIAL STABILITY OF THE BANK

3.1. Stress testing as a modern tool of bank risk management

The unstable state of financial markets increases the importance of bank risk assessment tools at the macro and micro levels. The large volume of problem loans in the credit portfolios of banks emphasizes the need to use such a tool as stress testing. In cooperation with regulators and financial and credit institutions, the International Monetary Fund (IMF) pays considerable attention to the issue of the development of financial market stability analysis tools.

On the website of the National Bank of Ukraine, stress testing is defined as: "a method of quantitative risk assessment, which consists in determining the size of an uncoordinated position that exposes the bank to risk, and in determining the shock value of a change in an external factor - the exchange rate, interest rate, etc. The combination of these values gives an idea of what amount of losses or income the bank will receive if the events develop according to the established assumptions" [37].

The purpose of stress testing: assessment of possible losses of the banking system in the event of the specified events. As a result of the analysis, an integral assessment is calculated, which makes it possible to determine which conditions (factors) the bank will find itself in a critical state if it changes.

Thanks to stress testing, it becomes possible to obtain a forecast regarding changes in the system at the early stages and to form preventive measures to prevent a stressful state or to develop a system of measures that will help avoid losses in the event of stress [50].

There are two methods for macroeconomic stress testing.

"Bottom-up" (bottom-up). Each bank separately conducts stress testing under specified scenario conditions. The obtained results are sent to the central bank of the country.

"Top-down" (top-down). The supervisory body independently conducts stress testing according to its own methodology based on aggregated data provided by the country's banks.

Two main methods of conducting stress testing are most often distinguished: sensitivity test; scenario analysis.

A condition of scenario analysis is that the source of the shock, or stressful event, is clearly defined, as well as the parameters of the financial risks that this shock affects. During the sensitivity analysis, the source of the shock is not determined, and the estimated parameters of financial risks are determined first. It should be noted that the time horizon is shorter for sensitivity analysis.

In different countries, central banks resort to different approaches and types of macroeconomic risk stress testing (Table 3.1) [51].

Stress testing in the EU is carried out by order of the EU Council of Ministers on Economic and Financial Affairs and is coordinated by the European Committee of Banking Supervisors together with the European Central Bank, as well as with the participation of national supervisory authorities and the European Commission. Its purpose: to assess the overall stability of the European banking sector and the ability of banks to withstand further possible shocks from credit, market and sovereign risks. In the recommendations set forth in the Basic Principles of Effective Banking Supervision developed by the Basel Committee on Banking Supervision, it is noted that it is advisable for banks to perform stress testing for the following risks: credit risk; liquidity risk; market risk (currency risk, interest rate risk); operational risk.[50]

Table 3.1

Types and approaches of risk stress testing by central banks of different countries

Type of stress testing	Approach to stress testing	
	"top-down"	"bottom-up"
Sensitivity analysis (test).	Ukraine	Switzerland, Great Britain, Italy, Germany, Austria, Czech Republic and other EU countries
Scenario analysis	Republic of Belarus, Ukraine	USA, Canada, Kazakhstan, Poland, leading EU countries

Summarizing the European experience, four basic methods of stress testing are distinguished:

- method of elasticities;
- loss assessment method;
- scenario method;
- index method [51].

The method of elasticities is used in countries with uncertainty in time frames regarding the quantitative assessment of economic relations, the parameters of economic policy do not have adequate and realistic forecasts, the shadow sector occupies significant volumes in the country's economy. When applying this method, one-sided changes in the object of the stress test are determined as a result of shock fluctuations in the values of the main economic indicators, in particular, the exchange rate or the interest rate.

The loss assessment method is related to the analysis of the most likely events, or the determination of losses due to the realization of economic risks. The resulting estimate is called expected risk, and at the level of an individual event, it may seem paradoxical. However, the expected risk is the most important statistical characteristic of the position, and therefore its value is the basis for making management decisions.

The scenario method analyzes moderate-adverse events. This allows you to calculate the maximum amount of loss that the investor will suffer for a certain period of time with a given probability and to demonstrate the change in the value of the investment portfolio in the form of a linear combination of returns on risk

factors. The main purpose of this method is to compare the basic forecast of the dynamics of the stress-testing object under various shocks from the economic environment.

The index method includes the construction of so-called "risk indices". The dynamics of the index values determined by the results of the stress test depends on the cumulative impact of the main risks, which are considered significant for the given period of time and affect stability. The results obtained by this method are clear and easy to understand, but it is advisable to use it only within the limits of a separate system - at the macro or micro level [50].

In Ukraine, the most common methods are scenario analysis and sensitivity analysis. We consider it expedient to summarize stress testing methods in a table for their comparison. (Table 3.2) [51].

Tables 3.2

Comparison of global and European approaches to stress testing methods with
Ukrainian

The name of the stress testing method in Ukraine	The name of the method of stress testing according to the global approach (recommendations of the IMF and the World Bank)	The name of the stress testing method according to the European approach (Basel approach)
Scenario analysis	Analysis of probabilistically uncertain events	Method of elasticities
Sensitivity analysis	Analysis of the most likely events	Loss estimation method
	Analysis of moderate adverse events	Scenario analysis
	Analysis of extraordinary events "exceptional but possible"	Index method

Regardless of the testing methodology, shock parameters that describe the simulated stress scenario occupy the main place. The regulator has the ability to test the banking sector for credit, market and liquidity risks.

The regulator can present credit risk shocks in the following forms: an increase in reserves for possible losses beyond the maximum limit of a given range; depreciation of collateral and an increase in the specific weight of loans of the two worst quality categories (based on retrospective statistics). To assess the

risk of concentration, the simultaneous default of the bank's largest customers is modeled. The results of regular testing with historical and hypothetical credit shock showed that the banking sector loses about half of its capital and becomes unsustainable. In other words, in the event of a systemic crisis, the domestic banking sector will suffer critical losses. The reasons are the high concentration of risks and the low quality of assets bearing credit risk in the event of adverse circumstances [52].

Given the history of stress testing (Table 3.3) [51], it is appropriate to make suggestions for improving the mechanism of NBU stress testing.

Table 3.3

The history of stress testing of Ukrainian banks

	Stress testing 2014	Stress testing 2015-2016	Regular sustainability assessment since 2018
Performers	9 auditing companies	NBU	Audit companies and the NBU
A selection of banks	34 banks (79% of assets)	60 banks (97% of assets)	25 banks (94% of assets)
Macroeconomic scenarios	base unfavorable	base	base unfavorable
Stress testing of large debtors	No	Yes	Yes
Risks	credit monetary	credit monetary	credit monetary percentage

First, it is necessary to clearly define the type of stress testing. The accuracy of the "bottom-up" methodology depends on how correctly each bank assesses the impact of the consequences of economic threats on the state of its portfolio. In addition, the bottom-up methodology usually involves the use of a much wider data set and is more realistic, as it allows the impact of stress scenarios to be followed at the microeconomic level. In turn, the "top-down" approach facilitates the comparability of results, but often turns out to be less accurate - especially if aggregated system-wide financial data is used. The central banks of leading countries use a "bottom-up" approach, which requires the development of a

complex methodology for stress testing to minimize inaccuracies in calculations [53].

Secondly, it is important to standardize the methodology of conducting stress tests for domestic banks and automate the procedures for obtaining the necessary data, based on the recommendations of the IMF and the World Bank. Their advisory nature introduces uncertainty into the behavior of banking institutions and deprives them of the opportunity to apply this attractive tool of activity modeling in the market environment. In this regard, it is appropriate:

- to develop an econometric model that describes the interrelationships and influence of macroeconomic parameters and allows assessing the consequences of stressful events for the banking sector;

- to clearly define the time horizon of modeling stress situations and the propensity of individual banks to risk;

- to improve obtaining estimates of the possibility of default of borrowers at the macro level; predict shock scenarios, etc.

Thirdly, it is necessary to ensure the regularity of stress testing at the macro level. It is advisable to recommend conducting stress testing of the banking system every six months. However, in the event of a deterioration of the financial or political situation in Ukraine and an increase in the level of risky operations in domestic banks, it makes sense to introduce the practice of conducting stress tests on a quarterly basis. It is appropriate to conduct an annual survey of domestic banks regarding the level of risks they are exposed to in the course of their activities, as well as the degree of their importance for each bank.

Fourth, it is important to inform the public about the results of stress testing in special annual reports of the NBU, thereby increasing the level of transparency of the banking system. Positive results can serve as a signal for all market participants to intensify their activities, while negative results, on the contrary, can sow panic. But, despite this fact, publishing the results of stress testing with lists of banks that did not withstand stress justifies itself, because in this way all banking institutions without exception will be able to strengthen their own capital base in a

timely manner. At the same time, the reputation of the national regulator as a body that controls the situation on the banking market will be supported, and the public's trust in it will only grow [50].

Thus, today stress testing is an effective tool of anti-crisis management, its necessity is determined by the interest of large banks that constantly increase capitalization and actively develop their business, as well as for small and medium-sized banks. As a rule, the internal resources of small banks are limited, so losses arising from adverse events can significantly reduce their stability. The opinions of scientists regarding the need for practical application of stress testing methods by domestic banks today are ambiguous. The implementation of stress testing is necessary, according to some representatives of the banking community, because in conditions of instability, this tool makes it possible to calculate non-standard combinations of factors that affect business and to identify the dependence between them. However, stress testing is an expensive procedure, for the implementation of which small and medium-sized banks lack a large database, software, and the latest computer equipment. However, the application of stress testing today is a necessity due to the current state of the banking system.

3.2. Credit risk management in the bank in order to ensure its financial stability

The rapid growth of the banking business today requires strong and structured risk management. However, the crises that have occurred in recent decades testify to the low level of risk management of banking institutions.

One of the main places in banking activity is credit risk, because the specific weight of active operations is credit. Thus, the development of credit risk management approaches is based on certain postulates.

The amount of credit risk is determined by a certain amount that can be lost if the borrower does not pay the debt [54].

Activities related to credit risk management definitely overlap with the bank's strategy in the field of lending and its compliance by employees directly involved in credit risk management. The specified strategy should contain clear goals and policies of the bank for credit risk management, as well as relevant norms and procedures [55].

The credit risk assessment system includes the following elements: assessment of the quality of loans that make up the loan portfolio; assessment of the structure of the credit portfolio based on the study of the dynamics of indicators; calculation of the expected yield from credit operations, which should compensate for the accepted credit risk of the bank; calculation of the amount of reserves sufficient to cover losses [56].

It should be noted that credit risk can arise at any stage of a credit transaction - from the stage of issuing a loan to the moment of final settlement. There are cases when the package of documents for obtaining a loan and the characteristics of the borrower meet the general requirements, but due to unforeseen circumstances, the borrower becomes bankrupt and cannot fulfill his obligations. Because of such situations, credit risk is considered the most problematic [56].

Thus, the credit risk management process should be aimed at researching all possible options for the development of events. Credit risk management should consist of identification, planning and forecasting, determination of norms and limits, creation of specific control procedures and technologies, constant monitoring.

Management of the loan portfolio is the basis of the bank's effective functioning, since it is impossible to increase the volume of lending without a proper assessment of the structure of its portfolio. As a matter of fact, the process of credit portfolio management is a clearly organized sequence of stages, which are mostly divided into three - portfolio formation, assessment of its quality and

adjustment. However, in order to detail the management process, in our opinion, the following stages should be distinguished [57].

The first stage is the formation of a credit policy on the basis of the current legislation on lending standards, the bank's strategy and tactics, which specify the sources of attracting resources and the directions of their investment. That is why a high-quality credit policy is the primary basis for minimizing the risk of the credit portfolio, because it contains the goals and priorities of lending, methodical and instructive provision of the credit process, which increases the rationality of the decisions made when issuing a loan, regulates the distribution of responsibilities among personnel and allows for the formation of an effective organizational structure of the bank[58] . If its credit goals are sufficiently clearly defined, then a credit strategy is created during the analysis of the financial market, which may lead to capturing a larger share of the market or choosing new types of credit activities. In accordance with the strategy, the formation of the asset portfolio and, on this basis, the loan portfolio is predicted. At the same time, for the implementation of strategic goals, it is necessary that they be expressed in qualitative and quantitative parameters, have acceptable values, and also provide an opportunity to evaluate the effectiveness of their application. The approximate strategy of credit portfolio risk management, which organizationally combines tactical and strategic goals and structurally and logically combines the stages of credit risk management, which allows to ensure support at the optimal level of the quality of the credit portfolio, is illustrated in fig. 3.1.

The second stage is the direct formation of the loan portfolio in accordance with the strategic and tactical goals of the credit policy, which is carried out by selecting borrowers' loan applications and allocating resources taking into account limitations, determining lending objects and entities, analyzing the state of the credit process, managing it, analyzing deviations from optimal values.

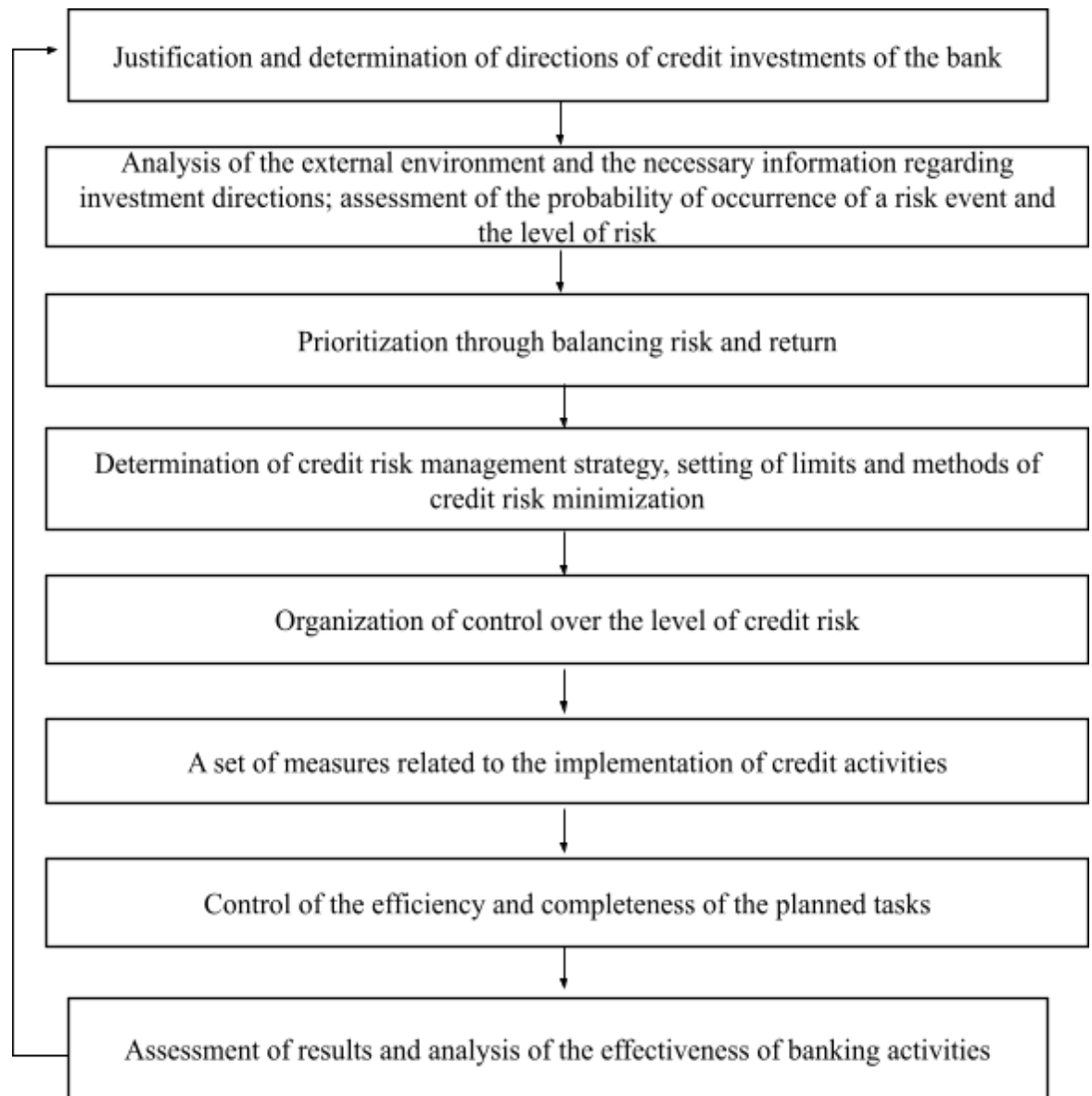


Fig. 3.1. Stages of bank loan portfolio management

At this stage, it should be taken into account that the high credit rating of the borrower is not always the basis for including the loan in the portfolio, because such a decision should be justified and depend on the current structure of the portfolio [59]. Thus, regardless of the individual nature of the risk of individual loans, when they are combined and included in the loan portfolio, the credit risk may change, as there is a possibility of exceeding the standards or violating the principle of diversification. Therefore, each loan issue (individual credit risk) must be compared with the acceptable level of risk of the credit portfolio as a whole. For this, it is necessary to take into account correlations between borrowers, which will

allow to simulate the effect of a change in the creditworthiness of at least one of them on the loan portfolio [60].

Therefore, at this stage, it is advisable to model the credit portfolio, which will make it possible to assess the parameters of credit risk and predict possible losses from it, as well as to determine the required level of reserves and capital.

The third stage - the review of the portfolio - involves the analysis of its profitability, the quality of loans in the structure, the evaluation of significant credit projects, the search for deviations from the credit policy, and the analysis of the total risk. This is due to the need to choose the best areas of lending while minimizing risk, maintaining the necessary liquidity and maximum profitability from credit activities to ensure the efficient functioning of the bank [61]. Such a compromise between various indicators should be aimed at increasing its market value under the conditions of sufficient equity capital, which, on the one hand, limits credit risk and maintains liquidity at the planned level, and on the other hand, regulates the growth of the loan portfolio with given indicators of its quality.

The next stage is the assessment of the quality and efficiency of the loan portfolio. It is aimed at the analysis of the optimal ratio of profitability and risk of loans, which is realized through structuring - their division into groups in accordance with risk, which allows to determine the deviation of actual indicators from expected standard values, to establish the level of credit risk to the capital and profit of the bank, and makes it possible to forecast the quality of loans in the future [62]. The result of this stage should be an assessment of the overall quality of the bank's credit activity, which, of course, depends on the quality of the formed credit portfolio.

The final stage. On the basis of the previous stage, the credit policy of the bank and the structure of the credit portfolio are adjusted in order to reduce the credit risk, for which the priority areas of lending are excluded from unreliable industries [63].

Thus, prompt detection, analysis and impact on credit risk at each of the specified stages of management will allow to form a high-quality credit portfolio

of the bank and ensure the achievement of the planned level of profitability from credit activity [64].

A clearly formed system of assessing the borrower's creditworthiness is a guarantee of successful risk management. The model of this system is presented in fig. 3.2. [64]

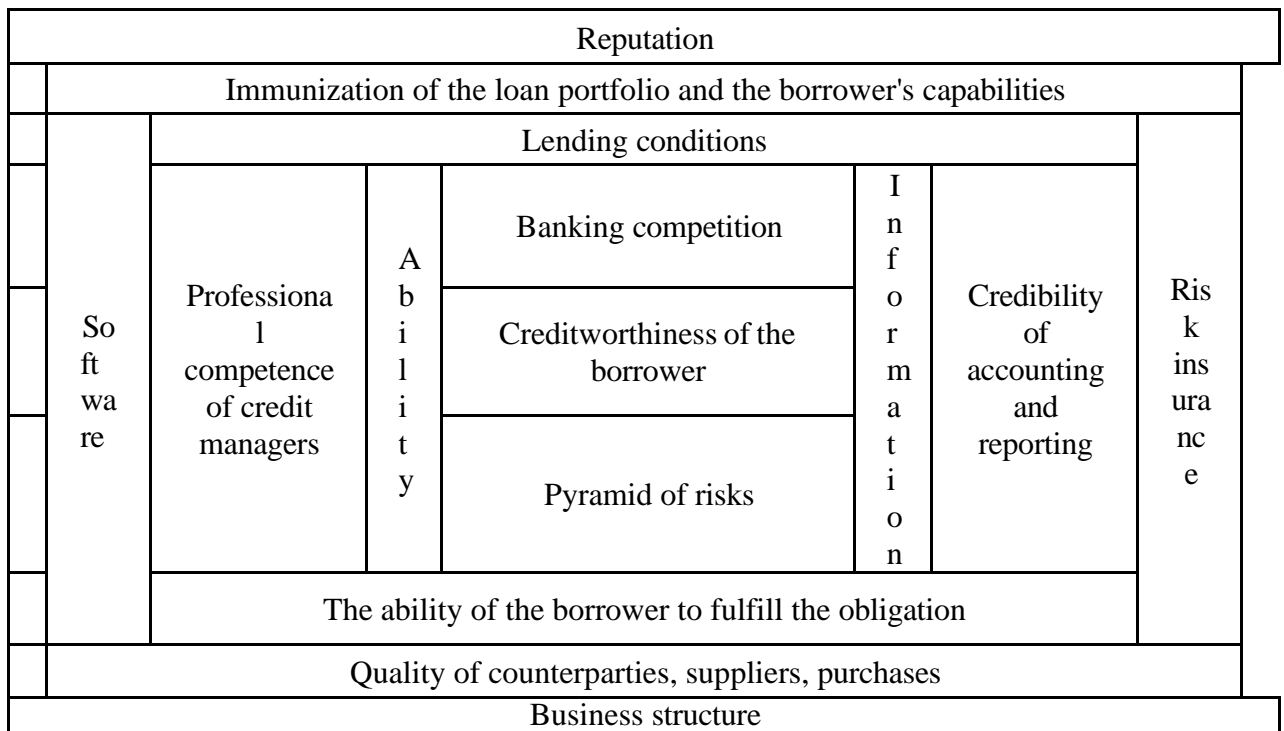


Fig. 3.2. Conceptual model for assessing the borrower's creditworthiness in the credit management system

The human factor plays a leading role in the decision-making process regarding the assessment of borrowers' creditworthiness and the debt service process. It is thanks to the stress resistance, professional competence, motivation and credit ethics of the employees that the opportunity to reduce the amount of credit risks increases thanks to the correct assessment of creditworthiness and the development of measures for the further management of accepted credit risks.

The creation of a credit risk management model will provide an opportunity to reduce the impact of credit risk on the profitability of credit operations. The proposed model is presented in the form of operational, tactical and strategic management levels (Fig. 3.3) [64].

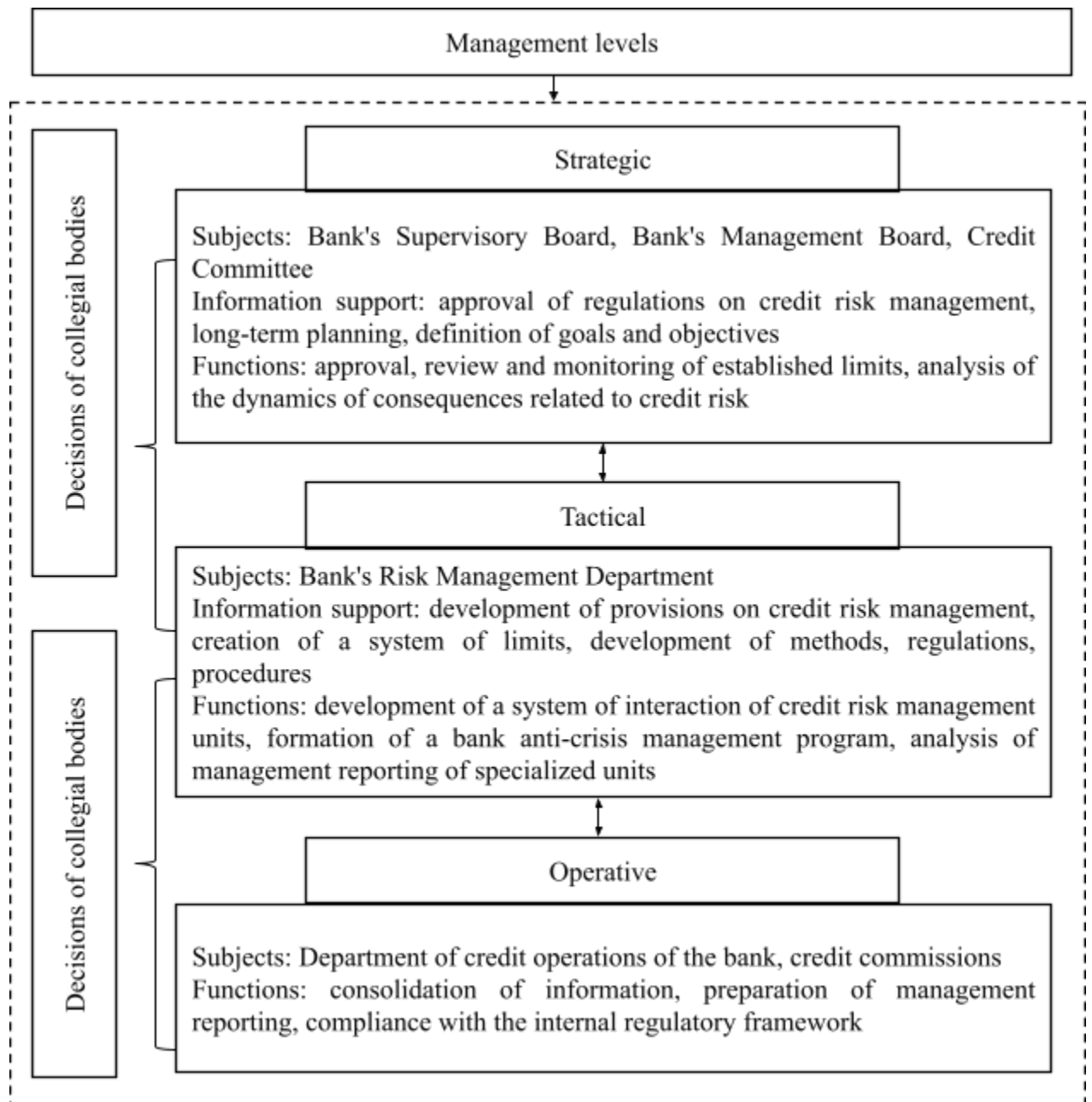


Fig. 3.3. Organizational and functional scheme of credit risk management in the bank

The presented organizational and functional scheme allows the bank to manage credit risk throughout the entire process, opening new ways for the development and implementation of new programs.

The credit risk management process is strictly regulated and multi-level, each participating unit has a clear list of goals, functions and tasks [65].

Thus, all stages of the crediting process must be carefully monitored by credit management. Effective credit management of the bank affects: the process of reviewing credit applications, authorizing credit transactions, compliance with the rules for concluding credit transactions, reporting on the bank's credit risks and the state of the credit portfolio, supervision of the bank's credit units, ensuring the profitability of credit transactions, management of a problematic credit portfolio, control over the general state of credit risks, training credit managers in credit risk management techniques and conducting credit operations.

The credit risk management system should include the following elements: special committees and personnel with clearly defined tasks and decision-making powers regarding credit operations, risk-oriented credit policy (strategy and tactics), functional subsystems (planning, internal control, operational regulation), which will interact with each other and contribute to the achievement of the main business goals of the bank. The bank's internal regulations must clearly define the bank's credit policy, provisions, procedures, and methods of credit risk management. The main task of credit management should be to ensure the financial stability and reliability of the bank. Ensuring the above principles and rules will help manage credit risks more effectively.

3.3. Directions of state policy on ensuring the financial stability of domestic banks

Financial stability is closely related to the priority task of the National Bank - maintaining price stability. Promoting financial stability and the stability of the banking system is one of the key functions of the NBU, according to the Law of Ukraine "On the National Bank of Ukraine" [66].

The main directions of ensuring the financial stability of banks in modern conditions can be grouped according to the following three groups, which are indicated in fig. 3.4 [67].

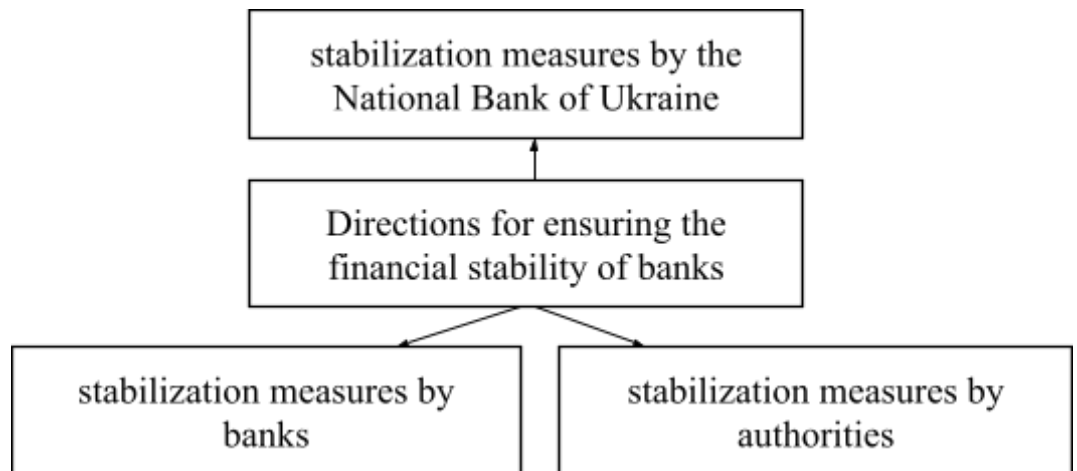


Fig. 3.4. The main areas of ensuring the financial stability of banks

Financial stability depends on the actions of all branches of government and market participants. Its provision requires concerted and coordinated efforts of all parties. Banks should assess the risks of new loans as conservatively as possible and form appropriate reserves [68]. Today, reserve levels for similar portfolios in different banks are very different. This may indicate that individual banks are underestimating possible losses from loan impairment.

The unchanged level of non-performing loans indicates that the rights of creditors are not protected. Progress in the legislative strengthening of their protection and improvement of judicial practice in the settlement of problem debt is extremely low. In addition, many banks make insufficient efforts to restructure and write off problematic debts [69].

Key issues that need quick resolution:

- the adoption of the necessary laws that will strengthen the protection of creditors' rights and create the prerequisites for the introduction of the secondary market of non-performing loans - the draft Law on debt management activities and the draft Law on amendments to some legislative acts of Ukraine regarding the restoration of lending;

- approval of the final conditions for the restructuring of foreign currency mortgage loans and the lifting of the moratorium on the collection of collateral for such loans;

- initiation by banks of the practice of collective restructuring of non-performing loans of joint borrowers through the mechanisms of creditors' committees [70].

The level of cooperation and dialogue between banks in the process of restructuring is critically low, which reduces the overall effect of negotiations with borrowers. The following proposals will help improve the quality of cooperation and dialogue between banks:

- more active use of the out-of-court restructuring mechanism based on the Law "On Financial Restructuring";

- introduction of a requirement for banks to take into account the state of service of borrowers' loans in other banks when assessing credit risks.

Since the beginning of 2019, banks have been publishing on their websites the value of the LCR standard, the distribution of the amount of credit risk by classes of debtor, the distribution of corporate loans, including non-performing loans, by types of economic activity, the distribution of individual deposits by size and the amount of possible compensation from the Individual Deposit Guarantee Fund. Also, at the end of last year, on the pages of its official Internet representation, the NBU for the first time published information on the results of the annual stability assessment for each bank [38].

This expansion of the list of public data on the financial condition of banks will contribute to increasing the transparency of their activities, which corresponds to the interests of investors, creditors, depositors, and other clients.

For the convenience of users, the NBU will additionally centrally publish consolidated information on its own web page.

To ensure financial stability, coordinated work of all financial market participants is required: the National Bank, banks, non-bank financial institutions and market regulators, as well as effective support of state authorities [71]. The

National Bank offers its recommendations to state bodies and banks and publishes its own tasks and intentions for the near future.

The delay in carrying out structural reforms creates high risks for financial stability and long-term economic growth in Ukraine [72]. Recommendations to banks:

- intensify work with non-performing loans (NPL-non-performing loans). Individual banks are gradually solving the problem of non-performing loans, restructuring them, in particular on the basis of the Law of Ukraine "On Financial Restructuring". However, there is currently no systemic progress. Many troubled borrowers default on their loans even after their financial situation has improved significantly. Banks should make additional efforts in working with financially stable but unscrupulous debtors;

- the mechanism of extrajudicial voluntary financial restructuring should also be more actively used, primarily collective restructuring actions (creditors' committees, coordination committees).

The National Bank will require financial institutions to formulate and actively implement plans to reduce the level of NPLs. In general, the share of NPLs in the sector remains extremely high. But in general, the banking system has already recognized losses from the deterioration of asset quality. More than 90% (85% excluding Privatbank) of non-performing corporate loans are covered by prudential (according to Resolution No. 351) or financial reserves (according to IFRS 9). Over time, the level of NPLs coverage by reserves should increase. From February 1, the collateral amortization rule came into effect, which led to an increase in prudential reserves. Currently, for any non-performing loan older than 4 years, banks cannot take collateral into account when calculating prudential reserves. And after the second year of the existence of the NPL, the collateral is only partially taken into account. In the next two years, this rule may significantly affect the capital of individual banks, if the servicing of loans issued by them as collateral does not resume. According to NBU estimates, full amortization of collateral can increase prudential reserves by more than 30 billion. UAH [38].

Over the past three years, progress in reducing NPLs has been barely noticeable. The National Bank of Ukraine intends to speed up the process by adopting the Regulation on the Organization of the Process of Problem Asset Management in Ukrainian Banks [73]. It will contain the following key requirements for financial institutions:

- to consider the expediency of establishing a committee of the bank's board to work with non-performing assets (NPA) and to create a permanent unit for working with non-performing assets, if the bank has a significant number of problem assets [74];

- to organizationally separate the unit dealing with non-performing loans from others engaged in active operations, and to focus its work on the settlement of problem debt;

- to create an early response system aimed at early detection of potentially problematic assets. For this purpose, potentially problematic assets will be determined, to which banks should pay special attention;

- to develop and implement a strategy for managing problem assets and an operational plan for its implementation. The strategy should set clear goals to be achieved within three years, and the plan should contain key performance indicators and a list of measures aimed at reducing the level of problem assets [75].

The regulation will comply with the best European practices and will be based on the Guidelines to banks on non-performing loans of the ECB (Guidance to banks on non-performing loans, March 2017), guidelines of the European Banking Authority on the management of non-performing and restructured exposures (EBA/GL/2018/06). However, in many banks, the practice of working with NPLs already complies with the specified norms [38].

By the end of the year, the NBU will prepare regulations that will regulate the work of banks with problematic debt [76]. Plans and intentions of the NBU:

- introduce a risk management system in banks. In order to bring risk management standards in Ukrainian banks closer to the best global practices, the National Bank approved the Regulation on the organization of the risk

management system in Ukrainian banks and banking groups. It changes the principles of risk management in banking and establishes mandatory minimum requirements for the organization of a comprehensive, adequate and effective risk management system in accordance with the Basel recommendations. The National Bank will provide methodological support to banks and will ensure that all the requirements of the above provision are fulfilled step by step;

- to start evaluating banks' internal provisions on credit risk. The NBU will soon carry out an inspection and agree to banks their internal methods of determining the coefficient of probability of debtor default (PD) for calculating credit risk (prudential reserves). In order to agree on the methodology with the National Bank, the bank must compile it correctly, and the calculation of the PD (default coefficient) must be based on its own experience and statistics of internal operations for at least the last 5 years [77]. Banks with an agreed methodology will have the right to set the PD ratio below the middle of the range defined for each financial class.

This should stimulate financial institutions to develop their own effective credit risk assessment methods [78]. In general, the planned changes should increase the adequacy of its assessment.

It should also be noted that new mechanisms for working with insolvent borrowers have been introduced. April 21, 2019 the Code of Ukraine on Bankruptcy Procedures entered into force, which will come into force on October 21 [38]. It introduced the procedure for restoring the solvency of an individual. From now on, a borrower who is in a difficult financial situation can initiate his bankruptcy. In this case, the procedure for restoring the solvency of the debtor - a natural person is launched, during which the arbitration manager will help the debtor to solve his financial problems. It is important that only the borrower and not the creditor can initiate such a lawsuit.

Debt restructuring for foreign currency loans in banks has also been settled [79]. Since December 2014, there has been a moratorium on real estate

foreclosures from borrowers who have defaulted on mortgage loans in foreign currency. It will be canceled one year after the code comes into effect.

The NBU notes that the bankruptcy procedure of legal entities will become more efficient and transparent: its duration will decrease, and the property of bankrupt enterprises will be sold exclusively through electronic auctions. The mechanisms introduced by the code will make it possible to reduce the costs of creditors for debt recovery [38]. This will stimulate the development of bank lending.

From July 1, banks will use the requirements for the credit register in a test mode, and from December 1 they will begin to fulfill them in a mandatory manner. When calculating the amount of credit risk, the bank will have to classify according to the worst class of debtor - an individual who, according to the information from the Credit Register, has defaulted in other banks. Also, the bank must lower the class of the debtor-legal entity to the worst, if the Credit Register contains information about its default in other banks or a high probability of such default. Thus, the new requirements will increase the quality of credit risk assessment by banks [38].

Therefore, it is worth noting that the financial stability of each individual banking institution is an important indicator of the stability of the entire banking system and is a prerequisite for the long-term development of the domestic financial system and the national economy [80]. The state has already taken many steps towards the financial stabilization of domestic banks. However, not all key indicators meet all the norms and requirements set by the NBU and the state for banks. The improvement of transparency deserves special attention, thanks to the NBU's requirements to increase the number of indicators that domestic banks must publish on their official websites.

CONCLUSIONS

The research carried out in the work allows us to draw the following conclusions.

Ensuring financial stability in times of crisis is one of the main tasks of both the National Bank of Ukraine and commercial banks separately. Financial stability of the bank is the ability of the bank to perform its functions as effectively and with minimal risk under the influence of internal and external factors, ensuring profitability and reliability of saving and returning deposits of its customers.

Credit risks have a direct and major impact on the financial stability of the banking system. The bank's credit risk is defined as the probability that the borrower, as a result of external and internal factors, will not be able to fulfill his obligations to the creditor, due to which the creditor will not be able to receive the planned income from the transaction. It is the level of credit risks that makes it possible to assess the effectiveness of the bank's risk management, the relevance of the regulatory framework regarding this issue, and the effectiveness of prudential policy instruments.

In Ukraine, special attention is paid to the organizational and legal provision of the bank's financial stability and the management of its credit risks. Compliance with the laws presented in the thesis will allow banks to get rid of a significant number of problems associated with non-performing loans and improve the quality of credit risk management. However, the rights of creditors and borrowers should be taken into account when introducing new legislation.

It should be noted that PrivatBank JSC is one of the most innovative banks in the world. An effective system of corporate management, a high-quality strategy for further development, constant improvement of the quality of service and the introduction of a complex of modern products and services for customers allow the bank to occupy a leading position among banking institutions of the domestic financial system.

Studies of the level of credit risk in the banking system of Ukraine showed that after the "cleaning" of banking institutions during 2014-2017 banks are adapting to new criteria from the NBU. Lending to individuals is gradually recovering, the economy is beginning to emerge from stagnation. But the issue of bank credit risk management remains key. After all, the growth of lending entails an increase in credit risks. Despite the improvement of the legislative framework by the state, banks should take a more detailed approach to the management of individual and group credit risks.

Credit risk indicators were determined and analyzed, such as: the ratio of granted loans to GDP, the specific weight of granted loans in the total assets of Ukrainian banks, the ratio of reserves to granted loans, the share of overdue loans. The analysis showed that since 2014, the volume of loans has decreased significantly, but the volume of reserves for credit operations has increased significantly. An analysis of banks' compliance with credit risk standards (H7-H9) was carried out. During the analyzed period, the banks complied with the specified standards. The revival of consumer lending was also revealed, which requires special attention from the bank's risk management.

Analysis of the level of financial stability of the banking system of Ukraine for the period 2016-2018. showed that the NBU makes optimistic forecasts under the condition of constant monitoring and regulation of banking institutions' activities, which will ensure the stable functioning of the banking system of Ukraine. Indicators of financial stability were determined and analyzed. The characteristics of the risks of the banking sector of Ukraine are given, in which the main problems and principles of optimization of these risks are indicated. The study of the share of non-performing loans in the dynamics showed that banks are reducing the volume of non-performing loans in the loan portfolio, but the value of this indicator remains very large and risky.

The calculation of the level of credit risk management in JSC CB "PrivatBank" was carried out using a mathematical model. For this, 9 indicators were determined, the influence of which was evaluated by 15 experts. Calculations

were carried out in dynamics for 2016-2018. The results of the analysis showed that the bank carefully treats the issue of credit risk management and minimization. The proposed model makes it possible to add or exclude indicators affecting the level of credit risk during the calculation.

The consideration and analysis of the above issues led to the need to find ways to improve the researched process. One of these directions is the use of a stress testing tool. More detailed stress testing will enable the NBU to more clearly understand the real volume of credit risks in the banking system, apply the necessary prudential tools, and make information more transparent.

In the work, attention was paid to credit risk management and it was determined that the quality of management of the entire crediting process depends on the effectiveness of management, namely: review of the credit application, authorization of credit operations, control over credit operations, report on credit risks and the state of the credit portfolio, monitoring of credit departments of the bank, ensuring the profitability of credit operations, management of problematic loans, control over general credit risks, training of credit managers in the methods of developing and conducting credit operations.

The state has already taken many steps towards the financial stabilization of domestic banks. However, not all key indicators meet all the norms and requirements set by the NBU and the state for banks. The improvement of transparency deserves special attention, thanks to the NBU's requirements to increase the number of indicators that domestic banks must publish on their official websites.

Thus, the application of a complex credit risk management system by the bank, which will contain an ordered and interconnected set of techniques, methods and methods for choosing the most optimal management solutions, will contribute to the stabilization of the banking system.

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APPENDICES

Appendix A

Principles of financial stability strategy and their characteristics

No	Principle	Characteristic
1. General principles of the strategy of ensuring financial stability		
1.1	The principle of adaptability and mobility	It consists in the flexibility and prompt response of the strategy of ensuring the stability of banks to changes in the factors of the external and internal environment, the intensity of their influence, challenges of modern trends of the digital economy.
1.2	The principle of strategicness and purposefulness	Presupposes, on an alternative basis, the targeted direction of the strategy for ensuring stability, taking into account the strengths and weaknesses of banks, as well as the opportunities and threats that are emerging in the market of banking services
1.3	The principle of hierarchy	It consists in the division of the components and main stages of the strategy of ensuring the stability of banks depending on the degree of priority, importance, as well as the formation of the levels of its executors
1.4	The principle of rationality and economic effect	It consists in the economic benefit, namely the excess of the obtained financial results from the implementation of the strategy for ensuring the financial stability of banks over the costs allocated to its development and implementation.
1.5	The principle of systematicity	It consists in establishing the expediency of considering the components of financial stability and the stages of its strategy as a whole unit, the elements of which are interconnected.
1.6	The principle of comprehensiveness and mutual coordination of management	It consists in ensuring the absence of contradictions and the presence of effective interrelationships in the process of managing the financial stability of banks, forming and implementing its security strategy.
1.7	The principle of financial stability	It reflects the focus of banks in the process of forming and implementing a strategy for ensuring financial stability, that is, a key condition for viability and further development, on attracting and using various forms of capital, as well as ensuring a controlled state of its financial resources.

Continuation of Appendix A

No	Principle	Characteristic
1.8	The principle of competitiveness	It consists in the permanent organization of banks in the process of forming and implementing a strategy for ensuring financial stability to combat the challenges of modern competition, forming a strategic set of competitive advantages and the ability of banks not only to ensure their own competitiveness, but also to maintain it in conditions of constant changes in the factors of the internal and external environments.
1.9	The principle of innovation and development	The process of ensuring the financial stability of banks should take into account the dynamics of changes in business processes, development trends in financial technologies, orientation of banks to continuous development, improvement and innovation.
1.10	The principle of trust	The essence of the principle is revealed in the need to form and maintain public trust in banks at an appropriate level. It is ensured on the basis of compliance with the principles of social and economic responsibility, as well as transparency of the activity of all subjects of this process
2. Special principles of the strategy for ensuring financial stability		
2.1	The principle of due diligence	It consists in the prevention by banks of the negative consequences of a potential change in the market situation by forming reserve funds in advance, taking into account the dynamics of activity and the level of systemic importance.
2.2	The principle of balanced profitability	Orientation to the optimal level of profitability of activity, sufficient to maintain an appropriate level of income for the owners, provided that banks and counterparties (clients, partners, taxpayers) are protected from excessive accumulation of risks
2.3	The principle of social responsibility	Ensuring the responsibility of bank management for full, consistent and comprehensive consideration and implementation of the norms and requirements of current legislation and ethical rules of conducting banking business

Continuation of Appendix A

No	Principle	Characteristic
2.4	The principle of economic responsibility	It consists in creating balanced and long-term business relations with clients, harmonizing the interests of banks and society in view of economic efficiency and social justice.
2.5	The principle of redundancy	In order to enable sustainable long-term development of banks, it is necessary to ensure quantitative and qualitative redundancy of tools for ensuring their financial stability.

Онлайн сервіс створення та перевірки кваліфікованого та удосконаленого електронного підпису

ПРОТОКОЛ
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Підписувач - 1: АЗАРЕНКОВА ГАЛИНА МИХАЙЛІВНА

П.І.Б.: АЗАРЕНКОВА ГАЛИНА МИХАЙЛІВНА

Країна: Україна

РНОКПП: 2571514226

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Підписувач - 2: Омеляненко Денис Олегович

П.І.Б.: Омеляненко Денис Олегович

Країна: Україна

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19.12.2024

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Тип носія особистого ключа: ЗНКІ криптомодуль ІІТ Гряда-301

Серійний номер носія особистого ключа: Не визначено

Алгоритм підпису: ДСТУ 4145

Тип підпису: Кваліфікований

Тип контейнера: Підпис та дані в одному файлі (CAAdES enveloped)

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