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V.N. KARAZIN KHARKIV NATIONAL UNIVERSITY**

Name of the faculty **EDUCATION AND RESEARCH INSTITUTE
"KARAZIN BANKING INSTITUTE"**

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Communications**

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QUALIFYING MASTER'S THESIS

on the topic:


**RISK MANAGEMENT IN COMPANIES IN MODERN
CONDITIONS**

student of higher education **Guo Nanming**

The work is accepted for defence in the EC

Head of Department

PhD in Economics, Associate Professor

_____  **Nadiia Morozova**


Scientific Adviser

_____  **Iryna Denchyk**

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Faculty EDUCATION AND RESEARCH INSTITUTE
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Educational program Management of Organizations and Administration

APPROVED
Head of the Department
of Management, Business and Professional Communications
PhD in Economics, Associate Professor  Nadiia Morozova
(initials, last name)

25 September 2024

TASK
FOR A QUALIFYING MASTER'S THESIS
Guo Nanming

1. Topic of work: "RISK MANAGEMENT IN COMPANIES IN MODERN CONDITIONS".

Scientific adviser Iryna Denchyk
(full name, academic degree, academic title)

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

2. The deadline for student submission of work November 18, 2024.

3. List of topics to be developed:

• In Chapter 1: to reveal the economic nature and classification of banking risks; to provide a description of the main methods of bank risk assessment; to investigate the risk management system of banking activity.

• In Chapter 2: to provide technical and economic characteristics of JSC "ProCredit Bank"; to evaluate the system of internal control and management of own capital of ProCredit Bank JSC; to disclose the individual risk management system of ProCredit Bank JSC.

• In Chapter 3: to propose directions for improving risk management as a condition for effective resource provision of a banking institution; to evaluate the use of stress testing in the bank's risk management; to investigate credit risk management in ProCredit Bank JSC.

4. Plan of qualifying master's thesis

No	Names of work sections
1	THEORETICAL BASIS OF RISK MANAGEMENT OF A BANKING INSTITUTION
2	PRACTICAL ASPECTS OF THE WORK ORGANIZATION OF PRO-CREDIT BANK JSC WITH RISK MANAGEMENT
3	IMPROVEMENT OF BANKING RISK MANAGEMENT

5. Date of issue of the task September 25, 2024.

Student Guo Nanming Guo Nanming
signature, full name

Scientific Adviser Iryna Denchyk Iryna Denchyk
signature, full name

ABSTRACT

The qualifying master's thesis contains 67 pages, 6 tables, 3 figures, and a list of 40 references.

The object of research is the process of bank risk management under modern conditions.

The subject of research includes theoretical, methodological, and practical approaches to improving the banking risk management system in contemporary circumstances.

The purpose of the master's thesis is to further develop the theoretical foundations and to create methodological and practical recommendations for enhancing risk management approaches in banking.

Tasks of a qualifying master's thesis include:

- to reveal the economic nature and classification of banking risks;
- to describe the main methods of bank risk assessment;
- to investigate the risk management system in banking operations;
- to provide the technical and economic characteristics of JSC "ProCredit Bank";
- to evaluate the internal control system and the management of ProCredit Bank JSC's own capital;
- to analyze the individual risk management system at ProCredit Bank JSC;
- to propose ways to improve risk management as a condition for effective resource allocation in a banking institution;
- to evaluate the use of stress testing in the bank's risk management system;
- to investigate credit risk management practices at ProCredit Bank JSC.

Based on the conducted research, theoretical and methodological recommendations, as well as practical proposals, have been developed to improve the risk management systems of banks, with the goal of enhancing their competitiveness. The findings highlight the importance of a comprehensive risk management framework that incorporates advanced assessment tools, effective control mechanisms, and

proactive mitigation strategies. The analysis of ProCredit Bank JSC provides insights into the current state of its risk management system, identifying both strengths and areas for improvement.

Practical significance: The recommendations developed through this research are actionable and can be implemented by ProCredit Bank JSC and other financial institutions to enhance their risk management frameworks. These improvements contribute to increasing operational efficiency, maintaining financial stability, and strengthening the bank's competitive position in the market.

Year of completion of the qualifying master's thesis: 2024.

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INTRODUCTION

Risk management is one of the key aspects of the activities of companies, especially banking institutions, in today's dynamic and unstable environment. Globalization, the development of digital technologies, economic crises and geopolitical challenges significantly complicate the processes of risk assessment and minimization. In the conditions of the war in Ukraine, risk management has become especially relevant, as banks and other companies are forced to work in conditions of high uncertainty, financial instability, destruction of infrastructure and growing threats to business security.

Given that the banking system is the basis of the country's economic stability, effective risk management becomes critically important to ensure its smooth functioning. Today's environment requires banks to respond quickly to challenges such as liquidity risk, credit risk, asset loss risk, and even operational risk associated with hostilities.

In addition, there is a growing need for innovative approaches to risk management, including stress testing, adaptation to new regulatory requirements, and the introduction of modern data analysis technologies. That is why the issue of improving the risk management system acquires strategic importance for ensuring the competitiveness of banking institutions in Ukraine, especially in the context of their role in the recovery of the country's economy after the end of the war.

The purpose of the qualifying master's work is the further development of theoretical foundations, the development of methodological and practical provisions for improving approaches to risk management in banking.

The tasks of the qualifying master's thesis are:

- reveal the economic nature and classification of banking risks;
- provide a description of the main methods of bank risk assessment;
- investigate the risk management system of banking activity;
- to provide technical and economic characteristics of JSC "ProCredit Bank";

- evaluate the system of internal control and management of own capital of ProCredit Bank JSC;
- to open the individual risk management system of ProCredit Bank JSC;
- to propose ways of improving risk management as a condition for effective resource provision of a banking institution;
- evaluate the use of stress testing in the bank's risk management;
- investigate credit risk management at ProCredit Bank JSC.

The object of research the process of bank risk management in modern conditions stands out.

The subject of research there are theoretical, methodological and practical approaches to improving the banking risk management system in modern conditions.

To achieve the goal, the following methods were used in the work: structural and logical analysis - to build the logic of the research structure; theoretical generalization and logical analysis - to reveal the essence and content of the statement "banking risk"; analysis and synthesis - to highlight the components of the banking risk management process formation system; methods of statistical and economic analysis - to assess the effectiveness of risk management in banking institutions.

Based on the conducted research, theoretical and methodological recommendations and practical proposals aimed at improving the risk management system of banks in order to increase their competitiveness have been developed.

The thesis consists of an introduction, three chapters, conclusions, and a list of used sources.

Key words: bank, risk, risk management, stress testing, credit risk, risk assessment methods, monitoring, control.

CHAPTER 1

THEORETICAL BASIS OF RISK MANAGEMENT OF A BANKING INSTITUTION

1.1. Economic essence and classification of banking risks

The bank, as a structural element of the financial system, by performing the functions of a transformer and an intermediary, carries out its activities within the framework of the market economy. It is obvious that in any segment of the market due to its specific features (changes in the economic situation, actions of competitors, changes in the mood of consumers, etc.), no activity can be conducted in conditions of complete certainty, and now, in addition, in conditions of destabilization of the global economy through military action.

Only the banking sphere in most countries of the world is subject to strict regulation by the state and special supervisory bodies. At the same time, over the past decade, the high pace of innovation in financial markets has led to both the emergence of new opportunities for banks and the growth of competition between them and non-bank financial - credit institutions. The result of this was the increase and diversification of banking risks, as an integral component of the economic process.

In their writings, most scientists consider such typical banking risks as credit, currency, liquidity risk, interest rate risk, market risk, legal risk, operational-technological risk, reputational risk, and strategic risk. But with international globalization and a sharp restructuring of the banking system, it is expedient to be aware of and investigate a relatively new type of risk - the risks of the bank's involvement in the processes of legalization of criminally obtained income.

The tendency to increase the variety of financial instruments on the financial market (diversification of the securities market, the emergence of new banking products, Internet banking, etc.) has provided banks with greater access to funds, which significantly increases the risk of laundering criminal proceeds. One of the problems in

risk management in banks is the process of identifying and recognizing actions to reduce it. Working out the essence of "banking risk", it is obvious that scientists are trying to adapt the category of "risk" to the reasons for its appearance in the banking sphere.

Banking risk is a complex and multifaceted phenomenon, so there is no single approach to its definition in scientific sources. Different approaches to the interpretation of the concept of "banking risk" by domestic authors are given in the table. 1.1 [1-5].

Table 1.1

Interpretation of the concept of "banking risk" by scientists

Author	Interpretation of the concept
Christopher Han	Modeling the bank's potential losses from each source of risk, which turns out to be the "adequate economic capital" of the risk
Nguyen Thi Thiu Kiang	it is an unplanned event with the bank's financial results that leads to losses
Kolodizev O.M., Pleskun I.V.	Banking risk can be considered as the probability of non-compliance of the volume, spatial and temporal parameters of the bank's financial flows with the expected ones, the possibility of the credit organization incurring losses or deterioration of liquidity, the threat of losing its resources, the uncertainty of the result of banking activities, the danger of losses, the value expression of the event that leads to losses and the characteristic activity that reflects its uncertainty
Primostka L.O.	The possibility of not receiving a profit or a decrease in the value of the bank's capital market as a result of adverse factors
Epifanov A.O.	The probability of making rational or non-rational management decisions, within which a reliable quantitative

	and/or qualitative assessment of the influence of factors can be carried out.
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A study of the explanatory definitions of "banking risk" in the existing scientific literature (Table 1.1) shows that many of them are similar, differing mainly in the approach chosen by the authors to understand the nature of risk in general (according to the above review of the origins of the concept of economic factors). Thoughtful interpretations of the concept of "banking risk" tended to focus on its financial nature and the negative aspects of banking risk, and less attention was paid to the possibility of possible positive outcomes.

It can be seen that the vast majority of researchers define the financial components of banking risk and are inclined to believe that banking risk is a financial risk that leads to losses and damages. This conclusion is confirmed by the fact that, when considering individual bank risks, researchers once again emphasize, first of all, the financial component.

Summarizing the results of the conducted research, the following definition of banking risk can be given: risks in the banking sector are the threat of non-fulfillment of management plans regarding the resource and income parts of operations, i.e. it is the probability that an event will occur that will negatively affect the bank's profit or capital.

For the most part, risks for the banking system are divided into internal and external, but scientists distinguish other groups as well. External risks significantly affect the stability and balance of the banking system. To assess endogenous risks, the methods of logistic analysis are most often used, since the management of such risks is practically impossible.

Internal risk has a significant impact on the activity of a particular bank, in which the greater the number of persons (clients, intermediaries, partners) associated with the bank, and the more actively the banking institution carries out operations, the greater the internal risk accompanying the activity of such a bank.

If we compare external and internal risks, it can be said that internal risks are easier to manage because they can be identified, classified, detected, assessed by the magnitude of the risk, and risk management methods can be chosen in place.

The author considered the normative and legal framework on the issue of defining the concept of banking risk. According to the Resolution "On the approval of the Regulation on the organization of the risk management system in Ukrainian banks and banking groups", risk is the probability of losses or additional losses or failure to receive income, or a party's failure to fulfill contractual obligations as a result of the influence of negative internal and external factors [6] .

The National Bank of Ukraine (NBU) defines banking risk (banking risk) as the probability that events, expected or unexpected, may have a negative impact on the bank's capital and/or income. Banking risks are influenced by the specifics of banking activities carried out in the conditions of market relations, and mean the probability of receiving revenues that are less than expected, a decrease in the cost of activity. Increases in banking risks lead to significant financial losses and even bankruptcy.

The main reason for the emergence of risks is the uncertainty of the environment of banking institutions, which is characterized by external and internal factors. External risk factors can be political (for example, changes in legislation or a ban on military actions), socio-economic (for example, inflation or a change in the rules of currency use), regional and industry (for example, increased competition or the deterioration of the financial condition of enterprises in the region). Internal risk factors can be political (for example, loss of liquidity or reduced profitability of operations), operational (for example, low level of professionalism of personnel), functional (for example, technological failures or legal errors).

Also, the bank's risk factors can be divided into controlled (those subject to the influence of management decisions by the bank) and uncontrolled; defined (about which there is complete and reliable information) and uncertain (about which there is either no information at all or it is not sufficient). Therefore, it is almost impossible to avoid risk in the process of banking activity, so banks must consciously manage them.

Taking into account the circumstances of the constant presence of risks in banking, it is appropriate to classify them, which facilitates detection, identification and timely adoption of prevention and minimization measures. To date, there is still no unified approach to the selection of criteria for the classification of bank risks in the scientific literature, and therefore there are a large number of different approaches to the classification of bank risks.

Researchers identify a wide number of classification features, on the basis of which the features of various bank risks are revealed. So, among the foreign literature, the most complete is the classification of banking risks proposed by Rose P.S., who singles out six main banking risks and four additional banking risks. The advantage of this classification is that it includes both endogenous and exogenous bank risks that directly affect banking [3-4].

The classification of banking risks by X. is more voluminous. Van Gruening [5], which distinguishes financial, operational, business and extraordinary risks. The author divides his financial risks into balance sheet structure, profit and loss statement structure, capital adequacy, credit, liquidity, currency, interest and market risks. Operational risks are divided into the risk of business activity, internal systems and operations, technological, risk of management error and fraud. The author divides business risks into market risk, legal risk, business activity risk, financial infrastructure risk. The author includes political risk, the risk of being "damaged" by the financial crisis and other exogenous risks as extraordinary risks.

Blank I.O. [5] proposes to classify banking risks within the following criteria:

- by the source of risk - systematic and unsystematic risk;
- by type – interest, currency, price, credit, investment, innovation, deposit, inflation, tax, criminogenic risk;
- depending on the nature of the object – the risks of a separate financial transaction, various types of financial activity and the activity of the financial organization as a whole;
- depending on the use of financial instruments, individual and portfolio risk;

- depending on the financial consequences – risks that cause economic losses, are characterized by lost profit, are accompanied by both economic losses and the receipt of additional income;

- by the nature of manifestation in time - permanent and periodic types of risk;

- depending on the level of probability of realization – risks characterized by the following level of probability of occurrence: low, coefficient of variation 10%; average, coefficient of variation 10-25%; high, coefficient of variation 25%; risks whose level of probability cannot be determined;

- depending on the amount of financial costs - permissible, critical and catastrophic types of risks;

- by the possibility of prediction – predicted and unforecasted risks;

- by the possibility of insurance - risks that are insured and risks that cannot be insured. The given classification of banking risks is the most complete and meaningful among scientists.

Systematizing and summarizing all of the above, it is possible to conclude that the correct identification and classification of risks in banks is a guarantee of stable functioning of the bank. After all, in the conditions of constant globalization of economic processes, the fact of the emergence of new risks that have not yet been investigated cannot be ruled out.

1.2. Characteristics of the main methods of bank risk assessment

Many Ukrainian banks use generally accepted risk assessment methods before providing clients with this or that service. It is also important to note that, according to the Basel Committee on Banking Supervision: "banks using internal rating models should conduct comprehensive stress tests to assess capital adequacy."

Stress testing of the bank's credit risk should be considered as one of the key elements of its management system, including the assessment of the potential impact of adverse events or stressful events on the bank's profit and/or capital. It should be noted

that stress testing significantly expands the possibilities of risk assessment and management. Analysis of the results of stress tests helps identify risks and weaknesses of banks and develop appropriate corrective measures [7].

The effectiveness of the risk management process largely depends on the quick response of managers to changes in the market situation, namely the financial condition of banks. It is very important to assess all the possible risks of the bank using mathematical methods, because a poor and incomplete assessment can lead to huge losses.

In our opinion, when assessing the risk level of a banking institution, not only one assessment method should be used, but a combination of them to obtain the most accurate result. Thus, the statistical method can be combined with elements of analytical and expert methods, or a combined method can be used to calculate the level of risk. Within the framework of such systems, relevant management solutions are developed, which are based on a methodological base that regulates the assessment and minimization of banking risks.

The NBU identifies the following types of significant risks that banking institutions are advised to assess: credit risk, liquidity risk, interest rate risk of the banking book, market risk, operational risk, compliance risk, and other significant types of risks that the bank is exposed to during its activities.

The vast majority of scientists claim that credit risk is the most important and dangerous banking risk, since credit transactions form the basis of the active activity of banking institutions, and therefore, their successful implementation leads to significant income. In its essence, credit risk is the probability of losses or additional costs or failure to receive planned income as a result of the debtor's or counterparty's failure to fulfill the obligations assumed in accordance with the terms of the contract.

Credit risk arises from all active operations of the bank, with the exception of debt securities and other financial instruments in the banking institution's trade crisis [6]. That is, credit risk means that credit payments can be delayed or not paid at all, which can lead to problems in the circulation of funds, and therefore lead to problems with liquidity. This type of banking risk and its dynamics significantly affect the size of

a banking institution's capital, profitability, as well as the structure of bank assets and liabilities.

The level of credit risk is determined by the volume of financial expenses due to the borrower's non-return or late return of the principal debt and non-payment of interest under the loan term. Subtypes of credit risk are mainly distinguished, such as credit risk under a separate agreement (this is the probability of losses due to the debtor's failure to fulfill a specific credit agreement) and credit risk of the entire portfolio (the amount of risks under all the bank's credit agreements). The credit risk of an individual deal can be defined as an external risk, and the credit risk of the entire portfolio as an internal risk.

Factors (sources of occurrence) of credit risk can be factors of the external environment (for example, regulatory and legislative regulation of the activities of banking institutions), internal factors (for example, excessive concentration of the loan portfolio), factors inherent in the borrower's activity (for example, the borrower's capital or reputation). Thus, almost all credit operations of the bank lead to the formation of credit risk, and until the bank's client returns the provided resources, the banking institution is forced to form reserves for possible costs from non-return of resources.

Liquidity risk is the probability of losses or additional costs or failure to receive planned income due to the inability of a banking institution to finance the growth of assets or fulfill its obligations in due time [6]. It can be argued that liquidity risk occurs when a banking institution cannot fulfill its obligations due to insufficient funds. Such a situation can arise when there is an imbalance of assets and liabilities by terms.

Also, the risk of liquidity consists not only in the imbalance of assets and liabilities, but also in the inability of the banking institution to attract financial resources to implement the strategic goals of the banking institution. Some researchers [5] distinguish investment liquidity risk (attraction of monetary resources) and asset liquidity risk. Liquidity risk management involves comparing the structure of the bank's obligations and requirements by maturity.

Interest rate risk of the bank book is the probability of losses or additional costs or failure to receive planned income as a result of the impact of adverse changes in interest rates on the bank book [6]. The interest rate risk of the banking book affects the

economic value of a banking institution's capital and net interest income. This type of risk occurs when the terms of return of provided and borrowed funds do not match, or when rates for active and passive bank operations are set in different ways. The most vulnerable to interest rate risk are those banking institutions that do not carry out a thorough forecast of the dynamics of interest rates.

Interest rate risk is divided into such subtypes as direct interest rate risk (impact on loan yield, impact on deposit costs, changes in the value of financial instruments in accordance with changes in interest rates) and indirect interest rate risk (changes in interest rates affect the borrower's ability to pay, which in turn leads to a change in credit risk).

Market risk is the probability of losses or additional costs or non-receipt of planned income due to unfavorable changes in foreign exchange rates, interest rates, and the cost of financial instruments.

So, market risk is associated with price fluctuations in the world's four main economic markets: the debt securities market, the stock market, the foreign exchange market, and the commodity market. These markets are sensitive to changes in interest rates. Therefore, the components of market risk include currency, interest and stock risks.

Market risk, in turn, belongs to speculative risk, which is expressed in the fact that price movements can lead to profit or loss. In order to manage market risk, a banking institution should formulate an appropriate policy, where it is necessary to specify the goals and methods aimed at protecting the bank's capital from the negative effects of unfavorable price levels. Also, to avoid risk, it is necessary to regularly reassess the portfolio of securities.

Operational risk is the probability of losses or additional costs or failure to receive planned revenues due to deficiencies or errors in the organization of internal processes, intentional or malicious actions of banking institution employees or other persons, failures in the operation of the bank's information systems or due to the influence of external factors [6].

Therefore, operational risk is the risk of direct and indirect losses as a result of inconsistency or error in processes, imperfection of the organization of internal control, actions of personnel or errors of computer systems. Operational risk includes legal risk, but should exclude reputational risk and strategic risk. In general, operational risk is one of the most common types of banking risks, but not all banks have operational risk management departments. The uniqueness of operational risk lies in the fact that it is present in almost all areas of activity of a banking institution, but it is difficult to establish and separate it from all other banking risks.

Compliance risk is the probability of losses or sanctions, additional costs or failure to receive planned income or loss of reputation due to the bank's failure to comply with the requirements of legislation, regulatory acts, market standards, rules of fair competition, rules of corporate ethics, conflict of interests, as well as intrabank or intragroup documents bank [6].

The main factors in the emergence of compliance risks are deficiencies in the organization of internal control systems. Other important factors of this risk are the participation of employees of the banking institution in questionable operations, and the insufficient level of professionalism, ineffective work of the financial monitoring and risk management system. The peculiarity of compliance risk is that this type of risk is one of those risks that are difficult to quantify.

The following types of compliance risk are distinguished: product risk, regulatory risk, legal risk, reputational risk, and operational risk.

Reputational risk is the probability of losses or additional costs or failure to receive planned revenues as a result of an unfavorable perception of the banking institution's image by customers, counterparties, shareholders, supervisory and control bodies. Violation of the principles of professional ethics, lack of sufficient experience in detecting dubious and illegal activities, or publication of negative information about a specific banking institution may be factors in the occurrence of this type of risk. A bank's positive business reputation is a necessary condition for a high level of competitiveness of a banking institution, and will also lead to an increase in the bank's

value, profitability and overall attractiveness for customers, counterparties or new employees.

Legal risk is the probability of losses or additional costs or failure to receive planned income due to the unexpected application of legal norms due to the possibility of their ambiguous interpretation or due to the invalidation of contract terms due to their non-compliance with the requirements of the legislation of Ukraine. Legal risk factors include the imperfection of national legislation, unclear or erroneous drafting of working documents regarding the confirmation of ownership or lease conditions.

Next, it is expedient to systematize the methods used in banking practice to assess each of the risks listed in Table 1.2 [8-10].

Table 1.2

Generalization of banking risk assessment methods and their characteristics

Methods	Characteristic	Advantages	Disadvantages
Statistical	the essence of this method consists in the analysis of the whole statistics related to effectiveness of those or other operations of the bank, with for the purpose of calculation probability of losses	the most accurate and justified method of risk assessment in the presence of statistical information over a long period of time; small costs for conducting a risk assessment	high labor intensity of work; when forecasting based on short-term estimates, the risk of receiving erroneous data is quite high
Analytical	involves the analysis of risk zones with the establishment of optimal risk for each type of banking operation and their totality as a whole	simplicity of calculations and availability of this method for a large number of users; the cost of conducting a risk assessment using this method is small	does not take into account the effects of specific risk factors on the increase or decrease in the degree of risk of the project as a whole; requires detailed information about the project or type of activity

The method of expert evaluations	is used when there is insufficient information or when determining the level of risk of an activity that has no analogues	evaluates those types of risk, the probability of occurrence of which cannot be estimated by other methods; ease of calculations and availability	errors are possible, the results obtained are inherently subjective
Coefficient	consists in calculating indirect (relative) indicators of riskiness	simplicity and efficiency of calculations; the presence of a clear risk assessment algorithm	requires a significant amount of information; there is a problem of choosing a set of coefficients that most adequately reflects the purpose of risk analysis
The method of analogies	provides a risk assessment based on the analysis of the database on the implementation of similar operations (projects) under similar conditions	simplicity of calculations; can be used as a means of preliminary assessment of projects	low assessment accuracy; ignoring the factor of constant development of any type of activity

Risk assessment methods, including statistical, analytical, expert, analogical and ratio methods, provide a versatile approach to risk analysis depending on the available data, research objectives and specifics of the activity. The statistical method is based on the analysis of historical data and allows obtaining accurate quantitative risk assessments, but its application is limited in conditions of insufficient data or variable external conditions. The analytical method uses mathematical models and makes it possible to take into account the relationships between various risk factors, although its complexity may require specialized knowledge and software. The expert method involves the involvement of experts for risk assessment, which allows taking into account non-standard situations, but its results depend on the subjectivity of experts' opinions. The method of analogies is based on the experience of assessing risks in similar situations or projects, which is useful for new or non-standard conditions, but

may be inaccurate due to the uniqueness of a particular case. The coefficient method allows you to quickly assess risks using index or coefficient calculations, providing simplicity and efficiency, but its accuracy depends on the correct choice of basic indicators.

Therefore, the complex use of these methods allows obtaining a more accurate and objective assessment of risks, reducing the probability of missing critical factors.

Table 1.3 shows the methods of assessment and management of the bank's financial risks by the types for which they are used [9-10].

Table 1.3

Methods of assessing the bank's financial risks

Evaluation methods	Types of banking risks
Statistical methods:	
"Monte Carlo" Altaman's Z-model Cheser's model Durand's model	Credit
VaR method	Credit, currency, interest
Methods of expert evaluations:	
The Delphi method "Decision tree" "Coefficient analysis" Method of ratings	Credit, market, currency, interest
Analytical methods:	
Duration	Percent
Stress testing	Currency, interest, market, liquidity, operational
GAP analysis	Interest, liquidity, interest
Method of analogies:	Credit, liquidity, currency, interest, market

In addition, the main methods of bank liquidity risk management Kovalenko V.V. [11] defines:

- fund pool method – the bank's funds from various sources are combined into one fund (pool), and subsequently distributed among separate assets;
- fund conversion method – each type of asset is tied to a specific type of liability;
- GAP-method – calculation of indicators of the absolute and relative gap between flows of assets and liabilities over time;

- securitization method – turning bank assets into securities;
- stress testing – risk measurement to assess potentially adverse impact results;
- the reserve position management method – determination of the reserve position without forming reserves in advance, but only by forecasting the number of funds that can be bought on the money market and finance a possible cash outflow; etc.

Therefore, the most universal approaches to the assessment and management of the bank's financial risks are stress testing and the method of analogies. Stress testing allows you to simulate various scenarios of the development of events and evaluate the bank's resistance to negative changes, which makes this method a key risk management tool in conditions of instability. The method of analogies, in turn, is based on the analysis of previous experience in similar conditions, which contributes to effective decision-making, especially in situations with a limited amount of available data. The combined use of these approaches increases the accuracy of risk assessment and provides a comprehensive approach to their minimization.

1.3. Banking risk management system

In banking, it is important to have a quality structure and an independent risk management system, which is due to the complexity of banking products and the succession of crisis phenomena in the financial sector. In the author's opinion, the definitions of "banking risk management" by scientists are not complete, since their attention is directed to the goal of this process - risk minimization.

Risk management, in addition to its minimization, should consist of measures by which it is possible to prescreen and detect the occurrence of such a risk at an early stage of its appearance. That is, bank risk management should be understood as a process by which banks identify risks, assess risk levels, monitor risk levels, monitor and control their risk positions [11]. The bank's risk management system is based on the complex application of four methods: accept a certain risk (banks are well capitalized); risk prevention (taking into account functional specialization); assignment of risk

(through hedging (insurance), authorization); management (establishment of technical risk management procedures and strict adherence to their principles).

The risk management system of a banking financial institution should cover all its structural elements — from the management body to the level that directly accepts or generates risks (table 1.4.) [11-12]

Table 1.4

Risk management system by risk classification

Components of a certain type of risk management system	Type of risk
Credit risk management policies; regulations on financing borrowers, including on balance sheet and off-balance sheet operations of the bank; the process of identifying loans of increasingly poor quality; properly deal with non-performing assets; submission of periodic reports to the board and supervisory board containing relevant information for assessing the level of risk of active operations; conducting an independent audit of credit activity, the purpose of which is to analyze the quality of loans to individuals and the credit portfolio.	Credit risk
Analyze the balance sheet accounts of the bank for a certain period to determine the volume and structure of the balance sheet items; determine the planning period for optimizing the balance sheet structure and break down the period according to changes in cash flow; set limits for each item of the consolidated balance sheet in accordance with the development strategy of banking and financial institutions; direct optimization of balance sheet items by calculating the optimal structure of assets	Liquidity risk
Derivation of the results of the stress test, where the stress factor will be changes in interest rates; presentation of internal documentation and pricing procedures for assets and liabilities (such provisions must take into account the bank's size, business model, business diversification and be approved in accordance with the form of corporate governance chosen by the bank); develop effective procedures for regularly reviewing interest rates to ensure they are in line with current financial market conditions.	Interest rate risk
Floating rate loans (measures that allow banks to change the interest rate on the loans they make in response to fluctuations); operating interest rate futures and swap operations to speculate on changes in market interest rates while avoiding interest rate risks; thanks to the forward agreement method, a forward agreement is reached between the client and the banking institution on the transfer of credit on a certain date, a certain amount and a certain proportion;	Percentage risk

Introduction of rules when banks are ready to conduct trading operations or take positions; establishing a rule regarding risk limits by type of banking instrument, by industry or sector of the economy and by territorial location	Market risk
Constantly review the provisions on the operation of money in case of any changes in the market situation; to approve the bank's currency position management mechanism; implement an approach to currency risk management: forward currency agreements; currency futures agreements, currency swaps.	Currency risk
Draw up a personnel management plan; implement and maintain modern technical solutions for banking products and services; provide the infrastructure needs of the bank (especially software and technical means) based on the volume and complexity of the current and planned activities of the bank.	Operational and technological risk
The process of monitoring the reputation of the bank's clients to avoid contacts with clients with a bad reputation; regularly monitor coverage of the activities of the Bank, related institutions and clients in the mass media in order to take appropriate measures to maintain and restore the Bank's positive reputation and image.	Reputational risk

A reliable risk management system requires certain provisions for each type of risk, process, qualified personnel and control system [66]. These reserves reflect the bank's intention to achieve expected results. They define the criteria and operations that must be applied to perform certain tasks. Well-developed conditions are based on a correctly formulated mission, values and principles of the bank's activity. They also clearly define the bank's level of risk tolerance. Mechanisms for changing reserves should be introduced in the event of a change in the nature of the bank's activity or the level of its tolerance for risk.

The rules should be specified taking into account the operational complexity, branching of the organizational structure, etc. The risk management system consists of management objects and subjects. The object position in the management system is occupied by the banking institution and its position in comparison with competitors on the financial market. The control variable is the assessment - the level of risk. The leading party or management entity in this subsystem is a risk management unit that uses various risk management methods and implements management influence

measures in accordance with the received information to reduce the risk level or maintain the risk at a certain level.

However, the main elements of the bank's risk management system are broad and can be presented in the following form (Fig. 1.1) [13-15]

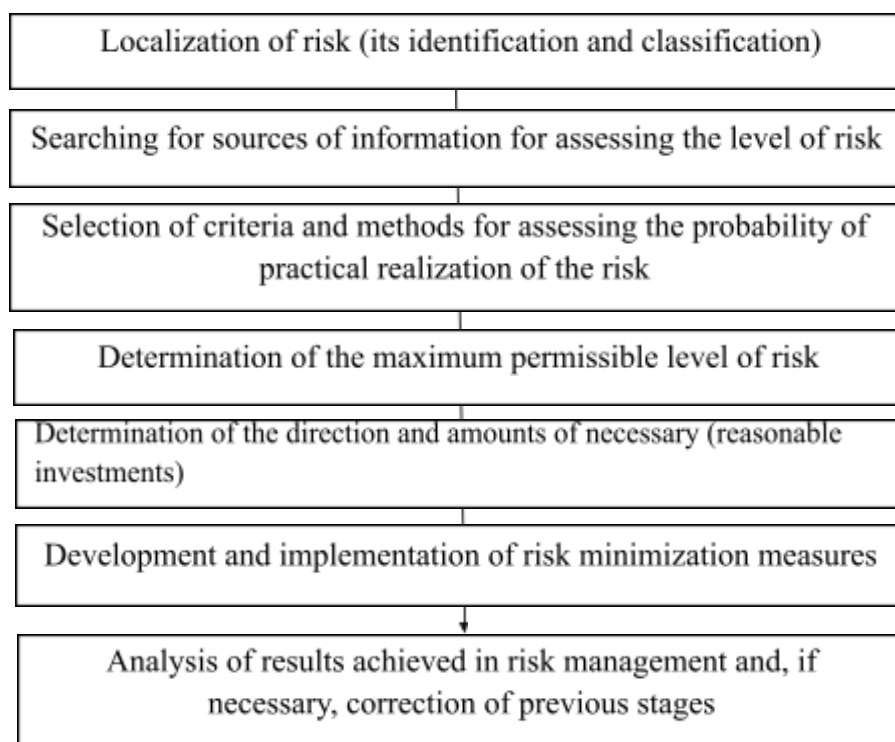


Fig. 1.1. The main stages of risk management

The risk management subsystem is built according to the principle of layering [12]. The process of risk management takes place at two levels: executive and coordination. Although banks have implemented large-scale risk management measures, the NBU and its recommendations are not enough to cover all stages of bank risk management and step-by-step actions to identify risks. It is only noted here that in global banking practice, risk management is divided into four interrelated stages: risk identification (detection), quantitative and qualitative risk assessment (measurement), risk control and monitoring [11].

Thus, under the risk management system, scientists should be aware of a consistent set of management measures for organizational, economic, methodological, analytical, regulatory and financial support for timely identification, assessment,

continuous monitoring and control of risks associated with consumer service events aimed at implementation of illegal activities and minimization of negative consequences of such events. Profit maximization during banking activity is possible when an acceptable level of stable risk is achieved and its minimization. To carry out effective risk management in the banking industry, it is first necessary to choose the optimal banking business strategy, optimize the risk monitoring system, establish effective management levels and various risk management mechanisms, as well as coordinate management levels.

CHAPTER 2

PRACTICAL ASPECTS OF THE WORK ORGANIZATION OF PROCREDIT BANK JSC WITH RISK MANAGEMENT

2.1. Technical and economic characteristics of JSC "ProCredit Bank"

JSC "ProCredit Bank" is part of the international group ProCredit Group, the shareholder of which is ProCredit Holding (Germany). ProCredit Bank started its activities in Ukraine in February 2001 as a bank providing loans to representatives of micro, small and medium businesses. Until autumn 2003, the bank was known as "Microfinance Bank". The name change is related to the shareholders' decision to unite under one name the network of banks founded by them, which work in the field of small business lending. In Eastern Europe, ProCredit has offices in Albania, Bulgaria, Bosnia and Herzegovina, Georgia, Kosovo, Macedonia, Moldova, Romania and Serbia. ProCredit Bank received the highest rating in Ukraine from the international rating agency Fitch Ratings. Serving corporate clients, the bank focuses on small and medium-sized businesses, as it believes that it is they who create jobs and make a significant contribution to the development of the country's economy. By providing simple and affordable opportunities for savings and other banking services, as well as devoting significant resources to financial education, banks strive to foster a culture of savings and financial responsibility among citizens. Since 2004, ProCredit Bank has chosen the direction of inclusiveness, expanding the scope of services to entrepreneurs and ordinary people. However, if in 2015 we focused on financing small and medium-sized businesses, thereby reducing the number of retail customers, today ProCredit Bank's "retail" arsenal includes simple, understandable deposit and card products [20].

In recent years, the bank has embraced the idea of expanding its services through digital platforms rather than brick-and-mortar branches. Almost all day-to-day banking can now be done online, and a new service is being developed that will allow customers

to do so without visiting a brick-and-mortar branch. Open an account online. department. Before the beginning of the full-scale invasion, the bank's activities were actually concentrated in five Ukrainian cities (Kyiv, Odesa, Kharkiv, Dnipro and Lviv), and after the invasion, to ensure the safety of employees and customers, the Kharkiv branch was moved to Kyiv, the total number of branches at this the moment is 4, with about 400 employees.

Assets on the balance sheet are considered from the point of view of their purpose in the bank's assets, from the point of view of the composition and targeted use of financial resources, as well as from the point of view of cost, which is determined by the bank's financial activities for the purpose of obtaining income. These areas of research make it possible to assess the liquidity and profitability of banks.

We will analyze the active and passive operations of banking institutions, and immediately note that the analysis is based on the comprehensive report of JSC "ProCredit Bank" (Fig. 2.1) [21].

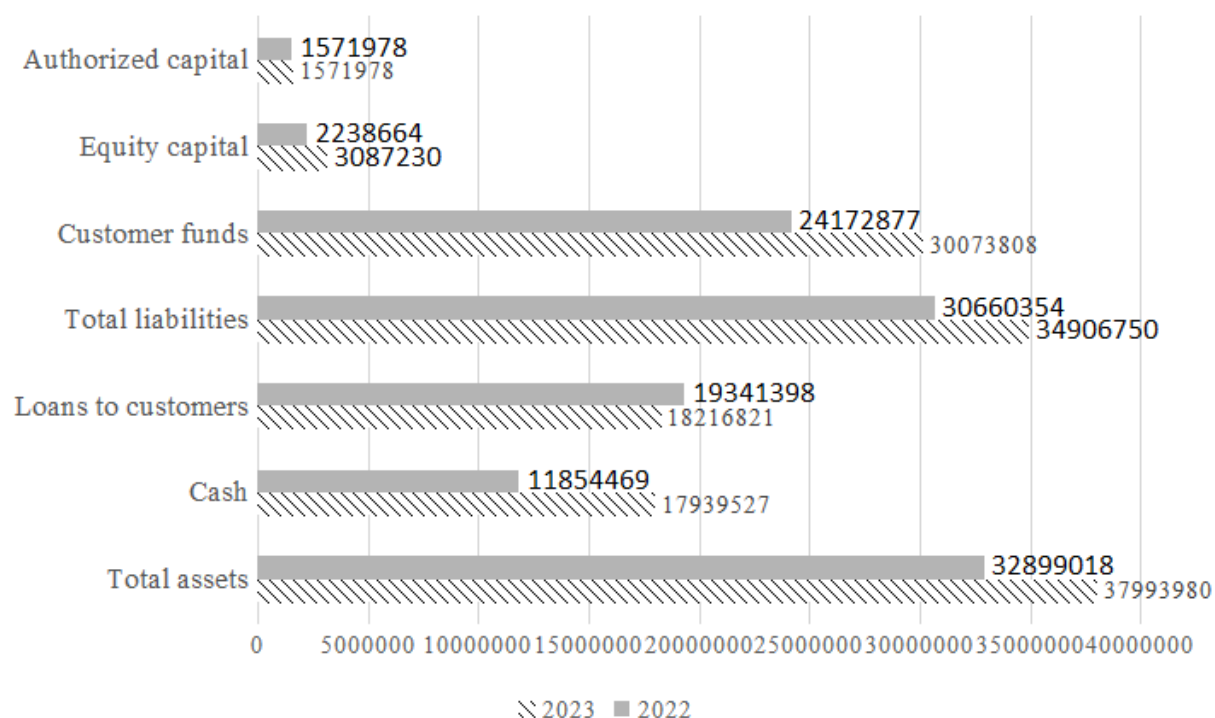


Fig. 2.1. Dynamics of active and passive operations of ProCredit Bank JSC for 2022. and 2023, thousand UAH

Based on the results of the analysis of the bank's financial indicators for 2023 and 2022, the following conclusions can be drawn. In 2023, the bank's total assets increased by 15.5% compared to 2022, reaching UAH 37.99 billion, which indicates the expansion of the bank's operational activities. The volume of cash increased by 51.3%, which indicates an increase in the bank's liquidity and its ability to promptly fulfill obligations. Loans to customers decreased by 5.8%, while in the banking sector overall the reduction was 1%, which may indicate general negative economic situation and decrease in demand for new investments. During the year, the priority was focused on maintaining the high quality of the loan portfolio, as well as on maintaining partnership relations and providing support to existing clients.

The bank's total liabilities increased by 13.9%, reaching UAH 34.91 billion, which indicates an increase in the resources involved. Client funds increased by 24.4% to UAH 30.07 billion, which reflects the increase in clients' trust in the bank. Equity increased by 37.9% to UAH 3.09 billion, which indicates the strengthening of the bank's financial stability. The size of the authorized capital remained at the level of UAH 1.57 billion, which indicates the absence of changes in the structure of the bank's core capital.

Therefore, the financial indicators of JSC "ProCredit Bank" demonstrate the growth of liquidity and trust of clients in the bank, which are positive trends. At the same time, the reduction of the credit portfolio may indicate the need for further improvement of the credit policy to increase profitability.

In 2023, the profit amounted to 848,566 thousand. UAH, which was achieved due to the growth of net interest income by 46%, which is a significant result compared to the loss of UAH 1.77 billion last year. The main factors of this growth were the increase of interest rates on the market and placement of accumulated liquidity in interest-bearing financial assets, such as short-term NBU certificates of deposit and government bonds. The policy of setting interest rates was aimed at stimulating the growth of the portfolio of client funds and remained within the market range, which also contributed to the expected increase in the volume of interest-free demand deposits (Fig. 2.2) [21].

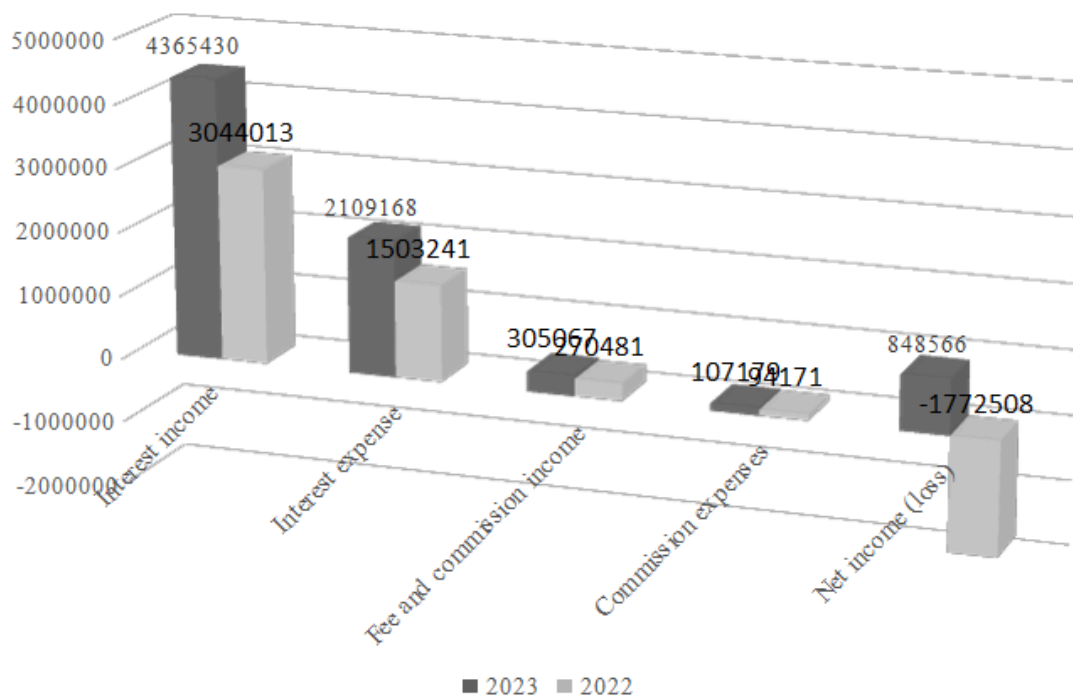


Fig. 2.2. Financial result of JSC "ProCredit Bank" for 2022-2023, thousand UAH

The overall performance in 2022-2023 demonstrates the resilience of the business model and the ability to respond effectively to significant downside challenges. Despite the deterioration of certain financial and operational indicators in 2022, during 2023 it was possible to significantly improve key metrics. Thanks to active efforts to attract customers, increase the volume of funds and increase the level of liquidity, the ratio of deposit and loan portfolios continued to grow, reaching an all-time high of 146% at the end of 2023. As of December 31, 2023, ProCredit Bank ranks 15th among 63 banks in terms of total liabilities to clients.

2.2. System of internal control and management of own capital of JSC "ProCredit Bank"

JSC "ProCredit Bank" introduced a comprehensive internal control system, the components of which include the internal control environment, risk management inherent in the Bank's activities, including compliance risk, the operation of the internal

control system, control over the Bank's information flows and communications, and monitoring the effectiveness of the Bank's internal control system.

The internal control system is implemented at all organizational levels of the Bank to ensure the achievement of the Bank's operational, information and compliance goals set out in its strategy and business plan, based on the Bank's procedures related to the organization and monitoring of internal control and fulfillment of the requirements of the National Bank of Ukraine, established by Regulation No. 88 "On the organization of the internal control system in banks of Ukraine" [22].

The main directions of internal control in the Bank in general include:

1) control over the achievement of the Bank's goals, including those defined in the strategy and business plan/annual budget;

2) control over ensuring the effectiveness of the Bank's financial and economic activities in terms of banking and other operations;

3) control over the effectiveness of asset and liability management;

4) control over the preservation of the Bank's assets;

5) control over the effectiveness of the risk management system;

6) control over compliance with the requirements of legislation and regulatory legal acts, internal documents of the Bank;

7) control over the reliability, completeness, objectivity and timeliness of accounting, preparation and publication of financial and other reports for external and internal users;

8) management of information flows, including receiving and transmitting information, ensuring the functioning of the information security management system.

From an organizational point of view, control procedures are implemented through the distribution of powers, duties and responsibilities for internal control between divisions, management and employees within the Bank's organizational structure, regular risk assessment and ongoing control measures.

From a methodological point of view, the implementation of procedures involves a description of the internal control system in the Bank's internal documents, in

particular regarding the frequency and time of control measures, responsible employees who perform control functions.

From a technological point of view, implementation is carried out by using automatic control procedures within the Bank's information systems, taking into account the Bank's considerations regarding economic feasibility and the possibility of using automatic control means.

At quarterly meetings, the Management Board and Supervisory Board of the Bank regularly receive the results of monitoring activities from the units of the 2nd line of defense to assess the shortcomings of the internal control system and track the implementation of corrective measures. In addition, the internal audit unit of the Bank regularly evaluates the effectiveness of the internal control system from the point of view of availability, comprehensiveness, efficiency and adequacy, its compliance with the types and volumes of the Bank's operations or changes in the business model [22].

Next, we will analyze the risk management practice of ProCredit Bank JSC, namely: capital management.

The guiding principle of capital management at ProCredit Bank is to ensure that at any moment of time the Bank does not take on risks that exceed its ability to bear them. To ensure proper capitalization, the Bank applies both regulatory and economic perspectives. The Supervisory Board has defined a clear risk appetite for both perspectives.

The bank monitors the level of risks using a system of various indicators, each of which has pre-set target and limit values.

The Bank's capital management has the following goals:

- ensure the availability of capital sufficient to cover (potential) losses due to risks associated with the Bank's activities, even in the event of an emergency;
- fully comply with the capital requirements established by the National Bank of Ukraine;
- to ensure the Bank's ability to implement plans for the continuous development of assets in accordance with the business strategy.

The Bank's capital management is governed by the Capital Management Policy and the Internal Capital Adequacy Assessment Process. Quarterly meetings of the Bank's Risk Management Committee review capital adequacy levels (both normative and calculated in accordance with Basel III), debt-to-equity 1 ratio and the results of capital adequacy assessment. Regulatory minimum capital requirements are established and controlled by the National Bank of Ukraine. Capital adequacy is calculated and regularly submitted in the form of reports to the Bank's Assets and Liabilities Management Committee and the Bank's Risk Management Committee. Such reports contain both actual data and forecast changes, which ensures compliance with current requirements and allows it to be done on an ongoing basis.

The bank fulfilled all relevant regulatory requirements during 2023 and plans to continue doing so in 2024 (Table 2.1) [21-22].

Table 2.1

Economic regulations of JSC "ProCredit Bank"

Year	H1, thousand UAH	H2, %	Hk1, %	H7
	Normative value			
	H1 - regulatory capital, not less than UAH 200 million;	H2 - regulatory capital adequacy standard, not less than 8.5 percent	Hk1 - level 1 capital adequacy standard, not less than 7.5 percent	H7 - the norm of the maximum amount of credit risk per counterparty, no more than 25 percent
September 2024	3971753.55	20,25	15,20	7.01
September 2023	3886388.5	23.64	12.5	5.83
September 2022	3395329.08	15.35	12	12,13

According to the current capital requirements established by the National Bank of Ukraine, banks must maintain a regulatory capital adequacy standard (H2) at a level of at least 10%. Tier 1 capital (H3) must be maintained at a minimum level of 7%. The bank is capitalized to comply with regulatory capital adequacy standards in accordance with the NBU. The bank's regulatory capital adequacy ratio as of the end of September

2023 was 23.64%, and the Tier 1 capital ratio was 12.5%. Management constantly assesses the impact of the external environment, which has undergone the Russian military invasion of Ukraine, on capital adequacy indicators.

Given the significant uncertainty associated with the ongoing war in Ukraine, management does not expect the Bank's capital ratios to deteriorate significantly under the current circumstances. At the same time, during martial law, the NBU allows banks to violate capital adequacy standards without negative consequences. It is important to note that the implementation of ICAAP according to national requirements will be phased in during 2024.

In summary, based on the Bank's expected indicators of business development, profitability and planned capital measures, a sufficient level of capital is expected for 2025.

2.3. Individual risk management system of ProCredit Bank JSC

The Bank's risk management system is a set of policies, instructions and risk management procedures that define the procedure to be followed during the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating all types of risks associated with the Bank's activities , at all organizational levels of the Bank.

The Bank places a special emphasis on the general understanding of risk factors and the need to analyze possible events/scenarios and their possible negative impact. The objectives of risk management include ensuring that material risks are identified in a timely manner, fully understood and properly described - for example, ensuring that no product or service is offered until all parties have reached a full understanding of its specifics.

All limits of individual risks, to which the Bank refers its own risk management strategy, are consistent and controlled at the level of ProCredit Holding. Limited deviations are allowed only within stricter limits (that is, in cases where such limitations

are not provided for by national legislation, for example, for currency risk) or if they are agreed with the Group's Risk Management Committee [22].

Careful monitoring of personnel, business continuity and IT security, liquidity, deposits and credit activity continues. The goal is to further strengthen the stability of the Bank by continuing to restrict lending, focusing on repayment and reimbursement of funds and maintaining appropriate liquidity reserves. On the basis of the risk analysis, which is carried out at least once a year, the significant risks of the ProCredit group are determined.

The risk management system covers at least the following types of risks [21-22]:

- 1) credit risk;
- 2) liquidity risk;
- 3) interest rate risk;
- 4) market risk;
- 5) operational risk;
- 6) compliance risk.

The bank is a non-trading organization, does not maintain a trading book, does not carry out investment activities, namely through the purchase of corporate securities, does not carry out transactions with goods, including precious metals. Thus, among the market risks, the main risk of the Bank's activity is currency risk.

Credit risk is defined as the risk that the counterparty carrying out a credit operation will not be able or will only partially be able to fulfill contractual obligations to the Bank. Within the general credit risk, the Bank distinguishes between credit risk arising as a result of customer lending operations, counterparty risk (including issuer risk) and country risk. It is further divided into credit default risk and credit portfolio risk to facilitate targeted risk management.

Credit risk is the biggest risk for the Bank, and the biggest part of this risk is the risk arising from customer lending transactions.

The main goals of activities in the field of credit risk management are to ensure the high quality of the credit portfolio, minimize the concentration of risks within the credit portfolio and adequately cover credit risks with reserves to cover losses on loans.

The maximum amount of credit risk is usually represented by the book value of financial assets in the statement of financial position. In addition, as of December 31, 2023, the Bank issued letters of credit and guarantees in the amount of PLN 173,509,000. UAH (December 31, 2022: UAH 169,617 thousand). As of December 31, 2023, the Bank had 137 borrowers (2022: 144 borrowers) who received loans for a total amount of more than EUR 1,000 thousand (borrower means a group of related counterparties). The total amount of these loans is 11,429,256 thousand. UAH (2022: UAH 12,548,863 thousand) or 54.5% of the total loan portfolio (2022: 54.8%) [21].

Liquidity risk is a risk when the Bank is unable to fully or timely fulfill its current or future payment obligations. The bank uses its own liquidity management system, created in accordance with regulatory requirements. Daily monitoring of highly liquid assets and the development of the client's fund base is carried out.

The bank has developed a clear response to potential cash outflows, including both pricing measures (management of interest rates and deposit terms) and plans to minimize cash outflows by reducing (suspending) lending and raising funds from the parent company in the event of an emergency. The loan portfolio is the largest component of the active side of the Bank's balance sheet. The loan portfolio mainly consists of loans for small and medium-sized businesses. Most of these loans are paid on an annuity schedule. This results in a relatively low but regular monthly cash flow. ProCredit Bank's funding base turned out to be stable and well diversified.

The Bank's strategic goal is to finance it mainly through attracted customer deposits, supplemented by other reliable sources of financing. To support the stability of the banking sector, the NBU continues to offer refinancing in the national currency against the collateral of the Bank's pool of assets. In addition, a fully confirmed back-up credit line from the parent company ProCredit Holding creates a liquidity reserve in case of an emergency. A key tool for measuring liquidity risks is predictive liquidity gap analysis, which shows the contractual maturity structure of assets and liabilities and estimates future funding needs based on certain assumptions.

To analyze the Bank's liquidity in a stress scenario, the bank applies more stringent liquidity assumptions to estimate liquidity in the future in a normal financial

environment. As of 31.12.2023 The bank complied with all liquidity standards established by the National Bank of Ukraine (Table 2.2) [21-22].

Table 2.2

Economic norms of liquidity of JSC "ProCredit Bank"

Year	LCRbb	LCRib	NSFR
	Normative value		
	LCRvv - the norm of the liquidity coverage ratio for all currencies, not less than 100 percent	LCRs - the norm of the liquidity coverage ratio in foreign currency, not less than 100 percent	NSFR - the norm of the ratio of net stable financing, not less than 100 percent
September 2004	434.24	517.08	179.26
September 2023	297.59	133.85	167.62
September 2022	165.16	239.13	123.67

During 2023, the bank's overall liquidity improved significantly compared to the pre-war level. This was caused primarily by a significant increase in deposits and the accumulation of liquidity from the repayment of the loan portfolio. To maintain liquidity at a sufficient level, the Bank carefully monitors the development of the loan portfolio, limiting the use of credit lines and issuing new loans. The Bank assesses its funding sources as sufficient and diversified, mainly because the core of the Bank's funds consists of a large number of customer deposits. In addition, customers continue to rely on a resilient banking sector. After the reporting date, the overall level of liquidity is also sufficient for the Bank.

Currency risk is a potential risk to the Bank's profits and capital arising from unfavorable changes in foreign exchange rates. ProCredit Bank aims to close its foreign currency positions and ensure that their open foreign currency positions remain within reasonable limits at all times. In principle, the bank does not engage in speculative positions on the currency markets. The Bank does not participate in trading operations and enters into transactions with currency, including derivatives, only for the purpose of liquidity management and risk hedging. Given the currency shocks of recent years, currency risk remains a serious threat to the capital of banks in Ukraine. A difficult

issue is the forecasting of currency risk shocks in the context of managed flexibility introduced by the National Bank of Ukraine in the 4th quarter of 2023 to ease currency restrictions, managed after tough administrative measures introduced in 2022.

The main hedging instrument of the bank against currency risks is the maintenance of closed currency positions. However, in 2022, the NBU temporarily changed the algorithm for calculating banks' open currency position limits in order to prevent possible overestimation by banks of foreign currency loss reserves in order to increase foreign currency purchases. This means that all new foreign currency reserves must be excluded from the local OCP calculation.

Thus, in order to keep the local OCP within the 5% limit, the Bank was forced to open a short OCP under IFRS while booking additional foreign currency collateral. Thus, maintaining a short OCP in accordance with the requirements of IFRS under conditions of expected devaluation of the national currency will lead to a negative financial result within the framework of the NBU's policy of managed currency flexibility. The Bank's attention remained on monitoring exchange rates and ensuring that the Bank's open currency positions were within an acceptable level. To mitigate currency risk, the Bank plans to maintain long OCP in accordance with local standards as far as practicable to ensure that short OCP as reported by the group is the result of additional reserves only.

Interest rate risk arises as a result of structural differences between the maturities of assets and liabilities that are sensitive to changes in the interest rate (for example, if a loan with a maturity of 3 years and a fixed interest rate is financed by a deposit with a maturity of 3 months, the Bank is exposed to the risk of reduction of the Bank's interest margin in the event of an increase in interest rates on the market, since in a quarter the deposit will be replaced by another, more expensive one, while the loan rate will remain unchanged).

The Bank's approach to interest rate risk assessment and management is based on the Policy of the ProCredit Group on interest rate risk management and the resolutions of the National Bank of Ukraine.

In order to reduce the level of interest risk, the Bank strives to agree on the repayment terms of those balance sheet items that generate interest income and interest expenses. ProCredit Bank ensures an adequate balance of the balance sheet structure from the point of view of revaluation of items that depend on the interest rate for all repayment periods. The objective is to achieve the greatest possible match between revalued maturities for assets and liabilities. In addition, the risk management function analyzes each large transaction in terms of its impact on the level of interest rate risks before it enters the Bank's balance sheet. Thanks to this, the Bank remains protected from changes in interest rates on the market in any field.

In 2023, in order to maintain a sufficient level of margin and interest income, the Bank consistently managed the change in interest rates for both assets (loans to clients) and liabilities (deposits from clients). At the same time, the increase in net interest margin is mainly due to high interest rates for both national and foreign currency. In 2023, the NBU revised its monetary policy, beginning at the end of July with a tendency to lower the discount rate, gradually reducing its value from 25% to 15% by the end of the year. A reduction in the discount rate directly affects the market environment and affects the bank's net interest income, mostly through a change in the structure of assets and liabilities. In addition, further growth of key rates in the EU and the US is unlikely, which will further reduce the bank's net interest income. However, taking into account the current structure of assets and liabilities, as well as the existing experience of working in conditions of lower interest rates, readiness for such a development is assessed as high. In the event of an increase in the risks associated with interest rates, a constant analysis of the balance sheet structure is carried out, and appropriate corrective measures are implemented if necessary.

Operational risk is defined as the risk of losses as a result of imperfect or malfunctioning internal processes, human factors, IT system failures and/or external events. In its activities, the Bank is guided by the Operational Risk Management Policy. The principles outlined in this document were developed for the purpose of effective operational risk management and meet not only the requirements of the National Bank of Ukraine, but also the requirements of EU legislation - the German laws "On the

banking system" (Kreditwesengesetz) and "Minimum requirements for risk management" (MaRisk).

Operational risk management is a balanced system with the following key components: corporate culture, management structure, risk assessment policies and procedures, analysis and approval of novelty risks, a system of key risk indicators and maintenance of a database on the occurrence of operational risks. Against the background of the Russian invasion of Ukraine, the Bank focused on the organization of personnel and operational risks. The purpose of these measures is to ensure business continuity and adequate staffing.

The Bank's digital approach to all day-to-day banking operations made it possible to quickly implement remote office models to take care of the health and safety of customers and employees. The bank was able to maintain business continuity and guarantee access to IT systems without significant performance degradation. In order to prevent the destruction of bank data during martial law, the processing and storage of personal data of customers, processing of information regarding banking operations are carried out through a cloud service deployed within the ProCredit banking group, the data centers of which are located in Germany. To ensure the continuity of the network, the Bank equipped all branches with diesel generators and backup communication channels.

Compliance risk Compliance risk is the probability of financial losses or imposition of sanctions, additional losses or loss of planned profits or damage to the Bank's reputation due to violation or failure to comply with the requirements of legislation, regulatory acts, market standards, rules of fair competition, norms of corporate ethics, conflict of interests , as well as non-compliance with internal documents of the Bank and the group of companies.

The commitment to create a strong culture of compliance with regulatory requirements to ensure responsible business behavior that meets all requirements, in the context of the ethics-oriented business model of the ProCredit group, always remains a priority for the Bank despite the difficulties of working in the conditions of war in

Ukraine after the invasion of the Russian army into Ukrainian territory in February 2022 and the declaration of martial law throughout the country.

The Bank understands the obligations and responsibilities it has as part of a development-oriented group of commercial banks, and recognizes and supports the maintenance of high ethical standards and the importance of taking responsible measures regarding its business conduct. In this regard, the Bank makes efforts to implement and ensure compliance with regulatory requirements through responsible behavior. Compliance risk management is carried out by a separate compliance unit in the Bank, independent of business units, support units and other risk management units; is subordinated and accountable directly to the Supervisory Board of the Bank.

The Bank's compliance risk management system includes a set of measures and security measures that ensure the level of compliance with current legislation and regulations, control of the level of reputational risk, as well as a system for evaluating the effectiveness of internal control.

Therefore, the internal control and risk management system of JSC "ProCredit Bank" is characterized by a high level of organization and compliance with modern banking supervision requirements. It provides identification, assessment, monitoring and minimization of risks arising in the course of the bank's activities. The implemented control mechanisms contribute to the maintenance of financial stability, transparency of operations and compliance with regulatory requirements. Emphasis is placed on adaptation to changes in the economic environment, regular risk analysis and effective response to potential threats, which guarantees the safety of customers and maintains trust in the bank.

CHAPTER 3

IMPROVEMENT OF BANKING RISK MANAGEMENT

3.1. Improving risk management as a condition for effective resource provision of a banking institution

Risk management is an important component of the management of a banking institution and is defined as the process of identification, measurement, assessment, control and monitoring of risks in order to ensure the achievement of strategic goals and optimal use of resources. Effective risk management is important for ensuring the stability and sustainability of a financial institution such as a bank, and can play a key role in the resourcing of a banking institution.

Here are a few aspects that explain why risk management is an important condition for effective bank resourcing:

1. Preservation of capital. Risk management helps bank managers to identify and assess risks associated with various types of assets and operations. This allows the bank to avoid losses and ensure the preservation of capital for further investments and development.

2. Ensuring financial stability. Effective risk management allows bank management to adapt to changes in the economic environment and market conditions, ensuring financial stability even in difficult conditions.

3. Compliance with regulatory requirements. Risk management helps banks comply with regulatory requirements and standards, such as the requirements of the Basel standards. This is important to ensure the trust of customers, regulators and other stakeholders.

4. The possibility of effective use of resources. Understanding and managing risk allows banks to effectively allocate their resources, using them where they are most needed and provide the most benefit.

5. Cost reduction and optimization of operations. Risk management can help avoid unnecessary risks, which can lead to a reduction in risk management costs and optimization of bank operations.

6. Ensuring trust and reputation. A bank that effectively manages its risks retains the trust of customers and other market participants, which can be important for maintaining its reputation and attractiveness in the financial market.

Banking risks arise from the uncertainty and inconsistency of banks' goals, poor industry analysis, and economic instability. They are also affected by the limited time for an objective assessment of the situation and incomplete information about the development of the bank and the financial condition of clients. This reflects the uncertainty arising from the competition between banks and other market participants, which affects the stability of financial flows and the amount of resources [11]. While it is impossible to completely avoid risks, competitive strategies and anticipating risk events can help mitigate their impact. It is also important to use anticipatory strategies for attracting and placing funds in new market segments, taking into account the competitive struggle in various areas of banking activity.

The complex application of the following approaches is characteristic of the risk management system in banking institutions:

1. Partial acceptance of risk (adequate bank capital) - determination of the optimal level of capital that can be spent or lost without harming the bank's financial stability. This allows the bank to ensure an adequate level of financial capital to cover possible losses.

2. Risk prevention (taking into account functional specialization) – development and implementation of specialized risk management strategies and procedures that take into account the specifics of the bank's functions. This is aimed at preventing the occurrence of risky situations within the framework of specific functional areas.

3. Risk transfer (through hedging (insurance), delegation of authority) – use of hedging or insurance methods to reduce the impact of risk events. It may also include delegating certain functions or powers to third-party organizations to optimize risk management. 4. Management (development of a technological risk management

procedure with subsequent strict adherence to its principles) – creation and implementation of a technological risk management procedure with an emphasis on strict implementation of its principles. This includes developing clear guidelines, standards and controls for effective risk management. Together, these approaches create a compromise risk management strategy that allows the bank to optimally use various tools and methods to reduce the impact of risks on its financial stability and business activities.

The risk management department at JSC "ProCredit Bank" plays a key role in ensuring the effective management of risks that arise in the course of banking activity. It implements a set of measures aimed at identification, assessment, monitoring and control of risks covering all areas of the bank's work, including credit, operational, market and other types of risks [22].

The department functions as an independent organizational structure, separated from the bank's business units, which ensures objectivity and impartiality in risk management decisions. Such autonomy effectively avoids conflicts of interest between units focused on achieving commercial goals and structures responsible for risk control.

The internal structure of the Department is based on key principles that determine the effective functioning of the risk management system. This includes the specialization of departments for different types of risks, a clear division of responsibility, as well as compliance with regulatory requirements and standards. Thanks to this, the Risk Management Department ensures timely identification of risks, minimizes their negative impact and contributes to maintaining the bank's financial stability.

The risk management department at ProCredit Bank JSC closely interacts with several bank committees that are directly involved in risk assessment and management. This provides a comprehensive approach to risk management at all levels of the organization. Here are the main committees that play an important role in this process:

- Risk Management Committee. This committee is the main body for defining and agreeing the risk management strategy in the bank. He considers key risks, assesses their impact on the bank's activities and makes decisions on the application of

appropriate methods of control and risk reduction. The Committee takes into account the recommendations of the Risk Management Department, discusses current issues related to risk management and approves the general policy in this area.

- Credit Committee. This committee focuses on credit risk assessment and lending decisions. He interacts with the Risk Management Department to determine the acceptable level of risk for specific loans, analyze the creditworthiness of borrowers and develop strategies to minimize potential losses. The credit committee also determines policies for managing the loan portfolio, controlling the level of problem loans and loss-making operations.

- The audit committee is engaged in checking and controlling internal procedures and policies related to risk management, as well as ensuring compliance with regulatory requirements. This committee interacts with the Risk Management Department to verify the effectiveness of risk management, as well as to ensure proper control of all transactions that may lead to financial losses.

- Liquidity and market risk management committee. This committee focuses on monitoring and managing the bank's liquidity and market risks, including currency, interest rate and commodity risks. The Committee considers strategies to minimize such risks and interacts with the Risk Management Department to implement appropriate tools and methods to ensure the stability of the bank's financial flows.

The General Risk Management Committee determines the Bank's liquidity management strategy and sets liquidity risk limits. ALCM is a central collegial body that manages liquidity. The Bank's Treasury manages the Bank's liquidity on a daily basis and is responsible for implementing the decisions of the ALCO. Adherence to the strategy, policies and limits is regularly monitored by the Bank's risk management department. The standards applied by the Bank in the field of liquidity management are based on the regulatory requirements and provisions of the Bank's Liquidity Risk Management Policy and the Treasury Organization and Activity Policy. Exceeding the limits and exclusions from these Policies are agreed by the Supervisory Board and the Group's Risk Management Committee.

The risk management department provides committees with the information they need to make informed decisions about risk assessment and management. This includes analytical data, risk assessments, proposals for their minimization and recommendations for improving the bank's policies. Committees provide strategic oversight, determining overall direction, while the Risk Management Department directly executes and monitors these strategies.

Thus, the bank's committees, working together with the Risk Management Department, ensure effective risk management, which allows to reduce negative effects on the banking activity and preserve financial stability.

Improving risk management is critical to the effective functioning of a banking institution, as it helps to reduce possible losses and improve the financial institution's resilience against various threats.

Below are several ways that can contribute to the improvement of risk management in a banking institution:

1. Creation of an integrated risk management system – development and implementation of an integrated risk management system that takes into account all aspects of business, including credit risk, market risk, operational risk and liquidity risk.

2. Assessment and classification of risks – regular assessment of all types of risks that may affect the bank's activities and their classification by degree of importance.

3. Development of risk strategies – determination of clear strategies for managing various types of risks. This includes the development of policies, procedures and control mechanisms.

4. Implementation of technological innovations – application of modern technologies, such as artificial intelligence, data analytics and blockchain, to improve the effectiveness of risk management and timely detection of potential threats.

5. Training and development of personnel - provision of training and development of personnel in the field of risk management to improve their qualifications and awareness of current risks.

6. Interaction with regulators – cooperation with regulators and compliance with all requirements and standards related to risk management.

7. Monitoring and reporting – regular risk monitoring and reporting to higher management bodies and shareholders.

8. Scenario analysis and stress testing – analysis of possible scenarios and stress testing to determine the bank's response to various economic and financial conditions.

9. Involvement of top management - involvement of top management in the process of risk management and identification of strategic decisions regarding risks.

10. Improvement of safety and risk culture - introduction of safety culture and risk awareness at all levels of the banking institution.

These measures will contribute to effective risk management in the banking institution and ensure its stability in changing economic and financial conditions.

Therefore, risk management is a critically important function for a banking institution, which contributes to the preservation of capital, ensuring financial stability and efficient use of resources.

3.2. Use of stress testing in bank risk management

Stress testing (ST) is a method of quantifying risk, 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: 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. ST is widely used to assess credit risk, liquidity risk, currency risk, interest rate risk and asset value. The purpose of stress testing is to assess risks and determine the ability to withstand shocks in the financial market.

The most common ST objects are:

- a sharp change in interest rates for internal or external borrowings, loans, securities, etc.;
- significant exchange rate fluctuations;
- credit risk in credit portfolios;

- sharp changes in the volume and structure of the financial institution's capital, the cost of collateral for mortgages;
- decrease in liquidity and the possibility of bank default;
- the probability of systemic risk arising on the basis of a sharp decrease in liquidity or loss of capital, etc. [23].

The National Bank recommends using the following as basic risk factors:

1) macroeconomic indicators: stability of the economic situation (economic downturn, radical change in the vector of economic development, defaults of first-class borrower companies, etc.); significant fluctuations in the exchange rate of the national currency; openness and accessibility of the interbank market; level of political and international stability; stability of financial markets, including the ability to counter speculative attacks; changes in interest rates, such as LIBOR, the discount rate, etc.; the possibility of devaluation of property provided as security for bank credit operations (in particular, due to falling prices on the real estate market, crisis in certain sectors of the economy, etc.); volatility of energy prices;

2) microeconomic indicators: the bank's ability to access external sources of maintaining liquidity; competitive position of the bank (determined by the SWOT analysis method as a generalized assessment).

For stress testing, it is advisable to use sensitivity tests, scenario tests, and tests of extreme values.

In Basel II, special attention during stress testing of banks is paid to the most important and significant credit risk in combination with the so-called macroto-micro models, which is explained as follows:

1) some requirements of the Basel Committee for stress tests, especially those related to the pro-cyclicality of the IRB approach, capital adequacy assessment and the ICAAP assessment process (internal capital adequacy and assessment process) are formulated by emphasizing economic cycles and the macroeconomic nature of stress events;

2) effective approaches and modeling of stress events, which are determined on the basis of macroeconomic indicators through the use of internal bank variables, are mostly a serious problem for the bank;

3) both in the context of FSAP (Financial Sector Assessment Programs) and during the analysis of financial stability, credit risk stress testing is one of the problems that most require additional research and new models [23].

According to the approach of the Bank for International Settlements, four key elements are distinguished in the macro- and micro-stress test:

- 1) a set of risk exposures to which stress scenarios will be applied;
- 2) a scenario that defines exogenous shocks for these exposures;
- 3) a model reflecting these shocks on the result (impact), tracking their spread to the system;
- 4) measure of the result of stress testing [7].

The International Monetary Fund has been using stress testing since 1999. The Financial Sector Assessment Program (FSAP) is a joint project of the IMF and the World Bank. FSAP stress tests cover several risks, including credit, market, liquidity and spread risk.

The IMF practices the following approaches to building stress scenarios:

- 1) univariate sensitivity tests through stress testing of the bank's balance sheet and studying the impact of macroeconomic factors on overdue loans (NPL);
- 2) an improved approach to the analysis of NPLs or provisions for covering overdue loans through the use of several macroeconomic variables;
- 3) stress testing of the credit portfolio using models for assessing the probability of default (PD), losses in case of default (LGD), related to macroeconomic factors;
- 4) application of non-parametric methods for bank stress testing both at the individual and institutional level [24].

So, the essence of stress testing is that financial regulators study the accounting statements of large financial organizations in more detail in order to calculate the amount of additional capital needed by banks to survive in catastrophic market conditions. Classic stress-testing algorithms include complex procedures (multifactor

scenarios) of compiling shock macroeconomic scenarios with a set of catastrophically unfavorable values of such variables as GDP, inflation, the national currency rate, market rates of return or stock market indices. Based on the analysis of historical data series, expected changes in bank balances under the influence of the specified macroeconomic shocks are modeled. If the target indicator of the bank (for example, capital adequacy) turned out to be lower than its normative values, it should be recapitalized immediately.

Stress tests are used by the world's leading central banks as an incentive to improve the quality of internal audit and risk management in banks, shifting the focus of banking supervision from the traditional analysis of the current state of liquidity and capitalization to their possible values in the future under the influence of extreme events.

Mandatory stress testing is carried out on a regular basis by the US Federal Reserve System, the European Central Bank and the Bank of England [25]. As already mentioned, multifactor stress tests consider the change of several risk factors at once. The most common of them are based on historical scenarios, which involve the study of changes in risk factors that have already occurred in the past.

The disadvantage of this stress testing method is that it does not take into account the characteristics of the market and institutional structures that constantly change over time. Multifactor stress tests can be based on hypothetical scenarios.

The advantage of this type of stress test is more flexible formation of possible events. Such scenarios can be used for certain possible events in which the bank's portfolio will be the most vulnerable (for example, there is such a phenomenon as flight to quality, when in stressful situations the demand for high-yield securities increases sharply, while the demand for other securities decreases sharply) . However, it is often difficult for a researcher to determine the probability of events that have never happened before.

Hypothetical scenarios, in turn, can be of different types. For example, many banking institutions use so-called worst-case scenarios. The essence of such a stress test is that all considered risk factors assume their worst values (for a certain historical

period of time). Further, on the basis of these values, the portfolio is reevaluated. Despite the simplicity and attractiveness of this approach, it does not take into account the correlation between risk factors, as a result of which the results may be incorrect. Therefore, the Basel Committee on Banking Supervision does not recommend banks to conduct such stress testing.

In addition to worst-case scenarios, there are subjective scenarios. In this case, the scale of change in risk factors depends on the opinion of experts. There are also scenarios that are based on the Monte Carlo method, the main advantages of which are, firstly, the possibility of using any distributions, and secondly, the possibility of modeling the complex behavior of markets (for example, changing correlations between risk factors).

Finally, one can single out systematic scenarios that rely on the so-called theory of extreme values. This approach is presented in the work of F. Longin, which considers the distribution of extreme values of risk factors for a certain period of time (historical) and based on this distribution, the value of Var (Value at risk) is calculated [25].

It should be noted that during the analysis of the normal distribution of factors, as a rule, the probability of stressful situations is underestimated. If you build the distribution of extreme values directly, you can avoid this problem.

Aggregate stress testing is carried out during the evaluation of the sensitivity of a group of banks to certain stressful situations. The purpose of such an analysis is to determine structural vulnerability and the overall impact of risk in the financial system. Yes, M. Sihak distinguishes three types of aggregated stress testing: sensitivity analysis, scenario analysis, analysis of the "contagion effect" (that is, analysis of the transfer of shocks from an individual banking institution to the entire financial system) [26].

An example of the analysis of the "contagion effect" was given by the American scientist S. Furfine, who studied the vulnerability of US banks to credit risk [27]. Summarizing the European experience, it is advisable to highlight four basic methods of conducting stress testing: the elasticity method; loss assessment method; scenario method; index method. The most common methods of stress testing in Ukraine are scenario analysis and sensitivity analysis.

In Ukraine, stress testing of banks has been introduced by the regulator since 2015. within the framework of the implementation of the Agreement between Ukraine and the EU for the purpose of monitoring and improving the financial stability of the banking system. The NBU methodology was based on the best foreign experience, but due to significant differences in the scale, structure, risk profile of banking systems, as well as the capabilities of regulators in different countries, adapting civilized methods of regulating complex systems with derivatives and structured financial products to the needs of domestic banking turned out to be a problematic task [28].

The specificity of the financial system of Ukraine with an underdeveloped interbank and stock market and a significant concentration of loans certainly influenced the 2015 stress testing methodology, which focused on credit, currency and interest rate risks. At the same time, the stress tests did not analyze the risk of loss of banks' liquidity as a result of mass withdrawal of deposits.

The diagnostic study of the banking system was initiated by the National Bank on April 24, 2015. within the framework of cooperation with the IMF and included a mandatory analysis of the quality of assets, on which the stress test of the 20 largest banks was later based. 16 out of 20 banks needed recapitalization, as 53% of loans in their portfolios were in default or pre-default condition.

In 2018, 24 banks underwent stress testing, and the capital requirement under the base scenario was determined to be UAH 42 billion.

In 2019, 29 banks were analyzed. According to the base scenario, the capital requirement for 11 banks was established at UAH 35 billion.

In 2021 30 banks were subjected to stress testing, the capital requirement was established for 9 banks in the amount of UAH 5 billion according to the base scenario [29].

The margin of safety increased year after year and helped the system withstand the test of a full-scale invasion. The stability of the Ukrainian banking system in the conditions of a full-scale war is the result, among other things, of many years of stress tests.

Assessments based on ST are not forecasts of financial performance of banks. The result of ST is an assessment of the size and adequacy of capital (core and regulatory) for each bank in the forecast period for each of the two macroeconomic scenarios. Therefore, banks must fulfill the minimum requirements for the adequacy of core and regulatory capital under the base scenario and reduced requirements under the adverse scenario.

Stress testing will be conducted in the following sequence:

1. Verification by auditing companies of the quality of the bank's assets and the acceptability of collateral for loans.
2. Extrapolation by the National Bank of the results of the first stage and assessment of the adequacy of the bank's capital.
3. The NBU's assessment of the bank's capital adequacy based on the results of stress testing under basic and adverse macroeconomic scenarios.

However, assessment in wartime conditions, unlike traditional stress tests, has its own specific characteristics:

- 1) Using only the base scenario that corresponds to the current macroeconomic forecast, without using the unfavorable one;
- 2) Banks will have enough time to restore capital in case of such a need - two years from the completion of the assessment. It will be possible to restore capital at the expense of profits from current activities;
- 3) The assessment will not affect all banks, but only 20 market leaders, but we will be able to see a complete picture, because these banks account for more than 90% of the assets of the banking system;
- 4) The assessment at all stages will be carried out by the National Bank. The bank expects to renew the assessment of the quality of assets with the involvement of independent experts, as early as 2025, and has strategic agreements on this matter with the IMF [29].

After a four-year hiatus caused by the war, from January 1, 2025, the assessment of the stability of banks and the banking system will be carried out according to the

standard procedure, involving external auditors to assess the quality of assets and applying an adverse scenario as part of stress testing.

The assessment will include three stages:

- asset quality assessment by independent auditors,
- extrapolation of its results,
- stress testing of the largest banks under basic, adverse scenarios.

In particular, the third stage, or stress testing, will cover the largest banks with indicators of the amount of funds of individuals, weighted by the risk of assets and the amount of loans of individuals, as well as banks that needed capitalization based on the results of the 2023 sustainability assessment. This will ensure coverage of more than 90% of the net assets of the banking system.

Thus, stress testing is an important risk management tool in banks, as it allows assessing the bank's stability in the face of economic or financial shocks, such as changes in interest rates, exchange rates or macroeconomic crises. Through these tests, banks can identify vulnerabilities in their financial structure and take corrective measures before the risks materialize. The use of stress testing allows banks not only to assess the probability of crisis situations, but also to develop strategies to overcome them, ensuring the stability of banking activities. Given the specifics of economic conditions, stress testing should be adapted to the realities of the time, including both traditional scenarios and new factors, such as geopolitical risks.

3.3. Credit risk management of JSC "ProCredit Bank"

Credit risk is defined as the risk that the counterparty carrying out a credit operation will not be able or will only partially be able to fulfill contractual obligations to the Bank. Within the general credit risk, the Bank distinguishes between credit risk arising as a result of customer lending operations, counterparty risk (including issuer risk) and country risk. It is further divided into credit default risk and credit portfolio risk to facilitate targeted risk management.

Credit risk is the biggest risk for the Bank, and the biggest part of this risk is the risk arising from customer lending operations.

The main goals of activities in the field of credit risk management are to ensure the high quality of the credit portfolio, minimize the concentration of risks within the credit portfolio and adequately cover credit risks with reserves to cover losses on loans.

The risk of non-fulfillment of credit obligations under customer lending operations is defined as the probability of losses arising from possible non-fulfillment of contractual payment obligations by the client under the credit agreement.

The maximum amount of credit risk is usually represented by the book value of financial assets in the statement of financial position. In addition, as of December 31, 2023, the Bank issued letters of credit and guarantees in the amount of PLN 173,509,000. UAH (December 31, 2022: UAH 169,617 thousand). As of December 31, 2023, the Bank had 137 borrowers (2022: 144 borrowers) who received loans for a total amount of more than EUR 1,000 thousand (borrower means a group of related counterparties). The total amount of these loans is 11,429,256 thousand. UAH (2022: UAH 12,548,863 thousand) or 54.5% of the total loan portfolio (2022: 54.8%) [21].

The main activity of the Bank is lending to small and medium-sized enterprises, which contributes to the diversification of the loan portfolio, and, accordingly, leads to the minimization of risk by geographical distribution and economic sectors.

As part of credit operations, the Bank adheres to, among other things, the following principles:

- Detailed analysis of debt and solvency of clients to whom loans were issued, including assessment of future cash flows;
- Conscientious adherence to customer service standards from the business sphere, combined with the application of a single approach to risk classification for the Group, increases the efficiency of collecting and analyzing significant risk data and makes it possible to identify risks;
- Thorough documentation of the results of credit risk analyzes and procedures performed within the framework of credit activities, which ensures the understanding of analytical procedures by knowledgeable third parties;

- Steadfast prevention of cases of excessive indebtedness of clients for loans received by them;
- Establishing long-term relationships with clients, maintaining regular contacts and documenting analyzes of debt dynamics as part of preparing regular reports on monitoring results;
- Careful monitoring of the status of repayment of credit debt;
- Organization of client-oriented intensive credit collection work in cases of overdue debt;
- Foreclosure of collateral in case of client's insolvency [21].

The bank takes into account the entire range of information about the client when making decisions on granting a loan - starting from financial statements verified by an auditor and ending with management reports and other unofficial information provided by the client.

The key criteria for making a decision on granting a loan are based, first of all, on data regarding the financial condition of the client (the borrower's liquidity, business profitability, other indicators of the client's creditworthiness), as well as - to a lesser extent - the availability and quality of collateral.

All decisions regarding the granting of loans are made by the Bank's credit committees. Credit committee members are subject to approval limits based on their qualifications and experience. All decisions regarding the amounts owed on average loans are made by the credit committees of the Bank's main offices. If the amounts owed are particularly significant for the Bank in view of their size, the decision is made by the Supervisory Board of the Bank, usually based on the results of prior approval from the responsible employees of the Group's Risk Management Committee at ProCredit Holding [22].

The most important basis for decision-making in the credit committee is a proposal for a financing and collateral structure that is adapted to the client's needs and depends on his risk profile.

In this context, the following general principles apply: the lower the loan amount, the more detailed the documentation provided by the client, the shorter the credit term,

the longer the client's history with this bank, and the higher the turnover on the client's bank account, the lower the collateral requirements will be.

As a rule, credit risks provided that the client has a higher risk profile are covered by reliable collateral, mainly through a mortgage.

Early identification of credit risk growth at the borrower level is included in all credit-related processes, which leads to prompt identification and timely assessment of financial difficulties faced by clients.

The bank introduced indicators for early detection of risks, developed in accordance with the requirements of the ProCredit Group and Ukrainian regulatory requirements, based on quantitative and qualitative risk characteristics. These include, but are not limited to, a decrease in account turnover or account balances, active use of extended credit lines and overdrafts over a longer period of time, and delinquency.

Regular recording and analysis of these early warning indicators helps to manage the working portfolio, identify potential default risks at an early stage and take necessary measures to avoid a significant increase in credit risk.

Reports on the "problem" portfolio are regularly submitted to the head of the branch, the Bank's head office and in aggregated form to ProCredit Holding. Events that may affect a significant part of the loan portfolio (general risk factors) are analyzed and discussed at the group and bank level. This may lead to the establishment of limits on risks for certain groups of customers, for example, in certain sectors of the economy or geographical regions.

From February 24, 2022, the war in Ukraine significantly affected the credit risk of clients. Starting with the full-scale military invasion of Russia in Ukraine, the Bank developed a comprehensive approach to the segmentation of the loan portfolio based on the location of the client and the impact of military operations on his business.

At the end of 2023, this approach was refined to include the latest available information and to reflect recent developments.

The loan portfolio was divided into three categories (red, yellow and green) depending on the risk of exposure to military actions:

1. The red zone contains areas directly affected by military operations or occupied.

2. The yellow zone includes a buffer zone located next to areas where hostilities are being waged or which are occupied.

3. The green zone contains areas with a relatively low risk of impact.

From the very beginning of the full-scale invasion of Russian troops on the territory of Ukraine on February 24, 2022, the Bank has been evaluating the impact of the invasion on the portfolio of client loans. This assessment is a dynamic process that takes into account the most up-to-date information on the scale of military operations, their impact on customer operations, and appropriate risk assessment and mapping.

In this context:

- 1) proactive monitoring and portfolio reclassification continues;

- 2) credit risk parameters are updated by supplementing the data history with the events of 2022, re-estimating statistical models and updating information on the latest macroeconomic forecasts.

By the end of 2023, 75% of the loan portfolio is in the red zone, amounting to 675,563 thousand UAH (2022: 78% or UAH 1,794,196 thousand), recognized as defaulted. The remaining 226,414 thousand UAH of the portfolio of loans in the red zone are clients whose activities take place elsewhere, all of them are included in the portfolio of doubtful loans and are in Stage 2 (2022: UAH 509,020 thousand) [21].

The bank was able to stay in touch with customers in the red zone to assess their situation and develop a recovery plan where possible. This made it possible to partially collect payments from customers in the red zone during 2023. The bank continues to work on additional recovery options. If there is no possibility of recovery, such exposures are gradually written off. All other customers are continuously evaluated. Payment behavior and financial performance, including business prospects, are critical in the evaluation. The minimum level of risk classification was implemented depending on the location of the business.

Portfolio monitoring was implemented to identify and assess potential risks associated with military exposure. During this process, the impact of grain export

agreements on the quality of the portfolio of agricultural producers was taken into account. The result of the portfolio-based assessment is reflected in the downgrading of the risk classification if an increase in credit risk is detected, and therefore in the asset quality and stage indicators. At the same time, the Bank continued to finance clients in the green and yellow zones, especially businesses supported by guarantee programs. Enhanced requirements are applied to business assessment and development of forecasts, which should fully reflect the current situation and the possibility of conducting business activities, including receiving supplies and selling own products.

Based on asset quality indicators, the loan portfolio is divided into three categories of loans:

- working,
- doubtful
- default.

Loans are allocated to these categories based on their arrears, risk classification system and other risk characteristics; this includes initiation of bankruptcy proceedings or similar court proceedings, restructuring or liquidation of other banks, as well as other factors that indicate a significant deterioration in the client's economic situation.

These indicators allow for a clear analysis of the quality of the Bank's portfolio, and are one of the most important credit risk management tools:

1) The portfolio of working loans has no signs of a possible increase in risk. Despite the fact that some loans may show warning signals, such signals do not necessarily lead to the detection of signs of increased risk;

2) The portfolio with doubtful loans includes loans with increased credit risk. This can be caused by temporary difficulties with payments (30-90 days), restructuring or other factors. However, the Bank is still waiting for a possible full repayment of the loan, for example, after restructuring.

3) The portfolio of non-performing (defaulted) loans includes all loans of defaulted clients, most of which are characterized by long overdue obligations (more than 90 days). This includes, among other factors, a situation where the borrower's fulfillment of its obligations to the banking group is highly unlikely or if bankruptcy

proceedings have been initiated against it. Below is more detailed information. The indicators and related internal processes have been defined in accordance with the requirements set by international regulatory bodies and are constantly reviewed and adjusted accordingly. After an increased risk of loan default is identified, it is placed under enhanced supervision. This includes close communication with the client, identifying the source of increased risk of credit default and careful monitoring of the client's business activity.

Decisions on measures to reduce the risk of credit default are made by authorized decision-making bodies. In addition, officials and specialists involved in loan recovery may be invited to support intensive work with credit risks. One of the first steps in managing such loans is to determine the economic and financial situation of the client, as this is the most important basis for making decisions about whether such a loan can be restructured. The goal is to make such decisions at an early stage, when the chances of stabilization are high and before the loan moves into an advanced phase of late payments.

Consequently, the management of the bank's credit risk during the war in Ukraine became extremely difficult due to uncertainty, changes in economic conditions and the direct impact of military actions on the business of customers. The bank needs to assess the credit risk, taking into account the geographical location of the client, the impact of the war on their activities and the projected solvency. In particular, risk zones (red, yellow and green) were introduced, which allows to classify customers depending on the degree of their vulnerability to military actions. In case of detection of increased credit risk, the bank carries out debt restructuring or takes measures to reduce the risk of default through increased monitoring and close contact with customers. At the same time, the emphasis is on early detection of problems and decision-making at a stage when the probability of restoring the stability of the client's business is high. In addition, the bank continues to finance customers who are in the green and yellow zones, applying increased requirements for assessing their financial condition to minimize possible losses in war conditions.

CONCLUSIONS

The results of the conducted research made it possible to draw a number of theoretical and practical conclusions, the main ones of which can be summarized as follows:

The first part of the work is devoted to the study of the theoretical aspects of the concept of "banking risks" as the probability of deviation of activity indicators from the planned as a result of the action of certain factors, which can lead to the loss of resources. In addition, the classification of banking risks was considered. The methods of assessment and management of banking risks applied both in Ukraine and abroad were also studied. The cause of risks is external and internal factors. It is impossible to completely avoid risks due to the specifics of banks' activities, so risks must be managed. Risk management is a key activity of bank management. The process of risk management consists of such stages as identification (identification) of risk, measurement (analysis and assessment) of risk, decision-making on acceptance or rejection of risk, measures aimed at minimizing risk, and monitoring (control) of risk positions. Risk management decisions can be to avoid, accept, minimize or transfer risk to third parties.

The second section is devoted to practical aspects of the organization of banks' work with the management of risk operations in their activities. The main financial and economic indicators of JSC "ProCredit Bank" were analyzed, which proved the stability of the Bank's activity. It has been proven that the main task of risk management at JSC "ProCredit Bank" is the ability and ability to estimate the probability of financial losses. Risk management of banking activities in the Bank covers all types of activities of the bank that affect the parameters of its risks, organizes a continuous process of analyzing situations and environments in which risks arise, and makes management decisions on issues affecting the risks themselves or the level of exposure of the bank to such risks, regulated by the norms of ProCredit Holding and Ukrainian legislation.

The third chapter analyzed the international experience of implementing the stress testing system as one of the most important risk management tools. It was determined

that the advantage of this technique is that it allows to assess not individual, but cumulative risks, as well as take into account risk diversification factors. risk management is a critically important function for a banking institution that contributes to the preservation of capital, ensuring financial stability and efficient use of resources. The implementation of the proposed risk management measures will increase the overall efficiency of the bank's management and operation, and minimizing the level of risk will make it possible to obtain smaller but stable profits. Balancing profitability and the level of risk and finding the optimal ratio between them is considered one of the important and difficult tasks facing the bank. managing the bank's credit risk during the war in Ukraine became extremely difficult due to uncertainty, changes in economic conditions and the direct impact of military actions on the business of customers. The bank needs to assess the credit risk, taking into account the geographical location of the client, the impact of the war on their activities and the projected solvency. In particular, risk zones (red, yellow and green) were introduced, which allows to classify customers depending on the degree of their vulnerability to military actions. In case of detection of increased credit risk, the bank carries out debt restructuring or takes measures to reduce the risk of default through increased monitoring and close contact with customers. At the same time, the emphasis is on early detection of problems and decision-making at a stage when the probability of restoring the stability of the client's business is high. In addition, the bank continues to finance customers who are in the green and yellow zones, applying increased requirements for assessing their financial condition to minimize possible losses in war conditions.

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