**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE**
**V.N. KARAZIN KHARKIV NATIONAL UNIVERSITY**

**Karazin Banking Institute**

Department: **Banking Business and Financial Technologies**
Specialty: **072 Finance, Banking, Insurance and Stock Market**
Educational program: **Financial Technologies and Banking Management**
Group: **AF-23M full-time mode of study**

# QUALIFYING MASTER'S THESIS

on the topic:

# RISK MANAGEMENT IN BANKING ACTIVITIES

higher education student **Huang Runli**

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

Protocol No. 5 dated December 6, 2024

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**_____Nataliia Hnyp**

Kharkiv – 2024

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**APPROVED**
Head of the Department
of Banking Business and Financial Technologies
Doctor of Economics, Professor
Galyna Azarenkova
« 25 » September 2024

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

of Huang Runli

1.Topic of the work "RISK MANAGEMENT IN BANKING ACTIVITIES".
Scientific adviser PhD in Economics, Associate Professor Nataliia Hnyp
(surname, first name, patronymic, academic degree, academic title)

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

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

3. List of issues to be developed:

In Chapter 1: to determine the theoretical and essential characteristics of the concept of "risk" and the mechanism of its management; to analyze the legislation of Ukraine on banking risk management; to determine the bank's diagnostic system and methodology for the purpose of implementing the banking risk management policy.

In Chapter 2: to make an in-depth analysis of the financial situation in JSC "MR BANK"; to perform an analysis of the level of financial risks of JSC "MR BANK" in recent years; to develop an econometric model for forecasting the amount of mandatory reserves at the NBU.

In Chapter 3: to investigate directions for improving the level of risk management in banking; to develop recommendations regarding the mechanism of risk management in banking activity; to evaluate the effectiveness of implementation of recommendations and proposals.

4. Work plan

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

5. Date of the task issue September 25, 2024

Student _____ Huang Runli
signature initials, surname

Scientific Adviser _____ Nataliia Hnyp
signature initials, surname

**ABSTRACT**
**ON THE QUALIFYING MASTER'S THESIS**
**"RISK MANAGEMENT IN BANKING ACTIVITIES"**
**of Huang Runli**

The qualifying master's thesis comprises 85 pages, 8 tables, 23 figures, 5 formulas, and a list of 71 references.

The **object of research** is the risk management process in banking.

The **subject of research** includes the theoretical-methodological and practical aspects of banking risk management.

The **purpose of the qualifying master's thesis** is to assess theoretical material on risk management in banking, analyze the financial condition and financial risks of MR BANK JSC, and develop ways to improve risk management in modern conditions.

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

- to determine the theoretical and essential characteristics of the concept of "risk" and the mechanism of its management;
- to analyze the legislation of Ukraine on banking risk management issues;
- to determine the system and methodology for bank diagnostics to guide banking risk management policies;
- to conduct an in-depth analysis of the financial condition of JSC "MR BANK";
- to analyze the level of financial risks of JSC "MR BANK" in recent years;
- to develop an econometric model for forecasting the amount of mandatory reserves at the NBU;
- to investigate ways to improve the level of risk management in banking activities;
- to develop recommendations regarding the mechanism of risk management in banking activities;
- to evaluate the effectiveness of the implementation of recommendations and proposals.

Based on the results of the research, **theoretical and practical provisions** have been formulated and presented by the author as concrete proposals to improve the risk management mechanism in banking. These proposals aim to strengthen the ability of banks to identify, assess, and mitigate financial risks effectively. The research emphasizes the need for an integrated approach that combines robust theoretical

frameworks with practical tools to enhance risk management practices.

**The results** can be utilized not only by JSC "MR BANK" but also by other banks and financial institutions seeking to modernize their risk management systems. These findings have the potential to contribute to the broader development of risk management practices in the Ukrainian banking sector, aligning them with international standards.

**KEY WORDS**: banks, risks, banking risk, banking risk management, economic forecast model, required reserves.

**CONTENT**

# INTRODUCTION

Banking activity in any country is inevitably associated with risks. The issue of banking risks is especially acute in the conditions in which Ukraine is now. No matter what efforts the bank makes to minimize risks, they will always exist - the only question is to what extent. The instability of the economic situation in the country, the imperfection of the legislative framework in this area necessitate a detailed study of the problems of minimizing banking risks. It should be noted that the choice of banking risk management methods is quite relevant today.

In this regard, the development of effective and efficient methods, models and tools of banking risk management is of particular relevance. Their development will make it possible to promptly and competently identify and assess risks, prevent them, reduce their level, and on this basis create conditions for ensuring the stability and efficiency of the bank's work.

In the light of global trends, the decision to change the approaches and methods of identifying risks based on quantitative assessment as well as on the nature of qualitative parameters, taking into account the complex of risks as a consequence of the transformation of the mechanisms of globalization of economic and financial relations, which has a significant impact on the current financial result and perspective of the banking institution, is being updated.

The problems of research problems of the economic category of "risk" and risk management were studied by well-known scientists, which was the result of fundamental works on riskology and risk management in economic activity.

The theoretical issues of the economic content and risk management tools have found a deep justification in the research works of scientists. Problems of banking risk management are studied in the works of Ukrainian and foreign scientists: Blank I.A., Brigham E., Vasylchenko Z.M., Versal N.I., J. M. Keynes, J. Neiman, J. R. Hicks, Joe F. Marshall, Knight F., Nakonechnyi O. M., Naumenkova S.V., Prymostka L.O., Kavkin A.V., Kyrychenko O.A., Kovalev O.P., Kravchuk V., Reisberg A., Rouz P.S., but at the same time there are still many unsolved

problems regarding comprehensive state regulation of banking activity taking into account risks.

The purpose of the work is to evaluate the theoretical material on risk management in banking, analyze the financial condition and financial risk of MR BANK JSC, develop ways to improve risk management in modern conditions

In accordance with the established goal, the following tasks were set and solved:

- to determine the theoretical and essential characteristics of the concept of "risk" and the mechanism of its management;
- to analyze the legislation of Ukraine on banking risk management;
- determine the bank's diagnostic system and methodology for the purpose of implementing the banking risk management policy;
- to make an in-depth analysis of the financial condition of JSC "MR BANK";
- perform an analysis of the level of financial risks of JSC "MR BANK" in recent years;
- develop an econometric model for forecasting the amount of mandatory reserves at the NBU.
- to investigate ways of improving the level of risk management in banking;
- to develop recommendations regarding the mechanism of risk management in banking activity;
- evaluate the effectiveness of implementation of recommendations and proposals.

The object of the study is the process of risk management in banking.

The subject of the research is theoretical, methodological and practical aspects of risk management of banking activity.

The following methods were used in the work:coefficient and aggregate,methods of economic and financial analysis, method of deviationsmethod of abstraction and synthesis, method of comparison.

The scientific novelty of the obtained results of the qualifying master's work lies in substantiating the need to use the stress-testing methodology, the use of

which will allow strengthening the stability of the state's financial system and stimulating the restructuring of the real sector of the economy, stabilizing the pace of development of the domestic economic system.

According to the results of the research, theoretical and practical provisions were formulated, which the author brought to specific proposals for improvementrisk management mechanism in banking.

Implementation of the proposals and recommendations given in the work will allow to improve not only the financial condition and increase the ratings of banking institutions, but also to make positive changes to the banking system of Ukraine as a whole.

# CHAPTER 1
# THEORETICAL PRINCIPLES OF THE PERFORMANCE OF BANKING ACTIVITY AND BASIS OF BANKING RISKS

## 1.1. Theoretical and essential characteristics of commercial banks and the main types of risks in banking

A commercial bank is a financial and credit institution of the joint-stock type, which performs basic functions and operations for individuals and legal entities for the purpose of appropriating profits [60].

Commercial banks regulate the payment turnover between business entities. The bank's provision of payment turnover is based on such principles as:

- work within available resources;
- full economic independence;
- building relationships with clients on the basis of market relations;
- regulation of one's activity on the basis of economic methods.

The work of the bank within the limits of its available resources means that in its activities it must ensure, firstly, in order to maintain its liquidity, the appropriate agreement in terms of terms between attracting deposits and loans, and secondly, in order to obtain profit, price agreement attraction of resources and profitability of their placement. The bank's resources include its own and borrowed funds, which it has at its disposal in order for the bank to fulfill its obligations according to the existing license.

Full economic independence means the freedom to manage one's own and borrowed funds of the bank, one's income that remains after paying taxes. But the economic independence of the bank also entails economic responsibility for its obligations, but not only for current income, but also for the authorized capital. According to banking legislation, the bank is liable for its obligations with all means and property. Therefore, since the bank assumes all the risk of carrying out

its operations, its shareholders can lose all their capital invested in the banking institution in case of bankruptcy. Therefore, the bank must work within its resources.

Banks create relations with their clients according to market relations, taking into account profitability, risks and liquidity. Implementation of these principles is ensured by the bank in its practical activities by performing such functions as transformational and intermediary. [51, p. 18]

The transformational function consists in the fact that the urgency of the bank's assets exceeds the urgency of the financial demands of customers, that is, the fulfillment of obligations by the bank. At the same time, the liquidity of the financial demands of clients is higher than the liquidity of the bank's assets, and the level of their risk is higher than the level of risk of the bank's liabilities. It is on this basis that the bank provides loans at the expense of the funds raised. This forms the basis of the banking business. Because with such a transformation of the bank's assets, it is achieved, firstly, to facilitate the access of business entities to financial resources, and secondly, to stimulate the owners of free cash funds to invest.

The intermediary function of the bank, as follows from its name, consists in the mediation between the borrower and the creditor and is carried out by initiating the loan, offering securities, organizing the issue, trust management, providing all kinds of operational services on the basis of information support appropriate for each of the specified types of activity . By their nature, the functions of mediation and transformation of assets are largely interconnected, so they are sometimes combined into a single function of bank mediation in credit and investment [41, p. 29].

The bank, as an economic entity in the structure of the financial system, performs its business within the framework of the country's market economy by performing transformational and intermediary functions. It is obvious that in any segment of the market due to its inherent characteristics (changes in the business environment, actions of competitors, changes in consumer preferences, etc.), no business can be conducted in conditions of complete certainty. As a result, the

terms "risk" and "uncertainty" are used to denote the absence or lack of certainty [25 p. 8]. At the same time, risk does not cause danger for one or another event, as much as the actions of an economic entity, when there is uncertainty, which is confident in overcoming negative phenomena and obtaining the necessary goal. For example, risk means an activity aimed at success in the absence of future guarantees, which requires economic skills and acquired knowledge of how to achieve success by overcoming negative factors [44, p. 425]. Many researchers share the meaning of the concepts of "risk" and "uncertainty", since at the moment there are no uniform standards for the use of these terms. One of the definitions of risk is that it embodies the danger of loss of profit, funds, resources, property, etc. due to changes in the conditions of financial and economic activity, adverse circumstances, etc.[17, p. 128].

Consider several definitions of the concept of "risk" given by economists:

1) I. Zagorodnii, G. Wozniuk, T. Smovzhenko believes that risk is "a perceived possibility of the danger of unforeseen losses of expected profit, property, money in connection with random changes in the conditions of economic activity, adverse circumstances" [26 p. 29];

2) Brigham believes that risk is "the possibility that some adverse event may occur" [8 p. 15];

3) S. Mochernyi associates risk with uncertainty, unpredictability, randomness of behavior of subjects of market relations, which can cause losses [46 p. 40];

4) O. Lavrushin defines in the textbook that risk is "...the probability of losses or failure to receive income compared to the predicted option" [4 p. 18].

Therefore, risk is the probability of deviation from the desired result of obtaining income by the bank under the influence of adverse external or internal factors.

Quantitative indicators are used to understand what risk is and how to measure it. At the same time, individual risk indicators or groups of such indicators never give a reliable picture of the development of the situation under

consideration, but only reduce its uncertainty. Calculations of indicators can be based on various mathematical models. For example, in life insurance, statistical calculations are used to determine the probability that the insured person will live to a certain age. Based on the results of the calculation of a specific case, the insured will be set an insurance tariff, which is actually a quantitative risk assessment for the insurance company. When quantifying credit risk, banks, as a rule, develop special mathematical and statistical models for calculating the probability of a potential borrower's default and the presence of various risks.

Such models are based both on the assessment of quantitative indicators, which are calculated based on the client's financial statements, and on qualitative indicators determined by the method of expert assessments. The criteria for evaluating the values of such indicators is established by each bank independently, based on its own operational experience.

When conducting business by an economic entity in a situation of constant uncertainty, which is an objective reality, the following questions may legitimately arise: "What is at risk?", "What is the nature of the possible loss?". When answering these questions, it is impossible to do without relevant characteristics that reflect the essence of the concept of "risk" [1, p. 298]. These characteristics include: danger, risk appetite, vulnerability, and degree of risk interaction. The specified characteristics, in turn, are usually considered as criteria for the classification of banking risks (Fig. 1.1) [9, p. 29].

The potential threat of damage is a key characteristic of the risk, determining the type of object, the nature of the damage, and the specificity of the negative consequences. As a result, according to the condition of danger, risks are classified: by the type of object, by the cause of damage, by the typicality of negative consequences. According to the specified classification, risks related to income and risks related to business (market, commercial, fundamental) are distinguished.

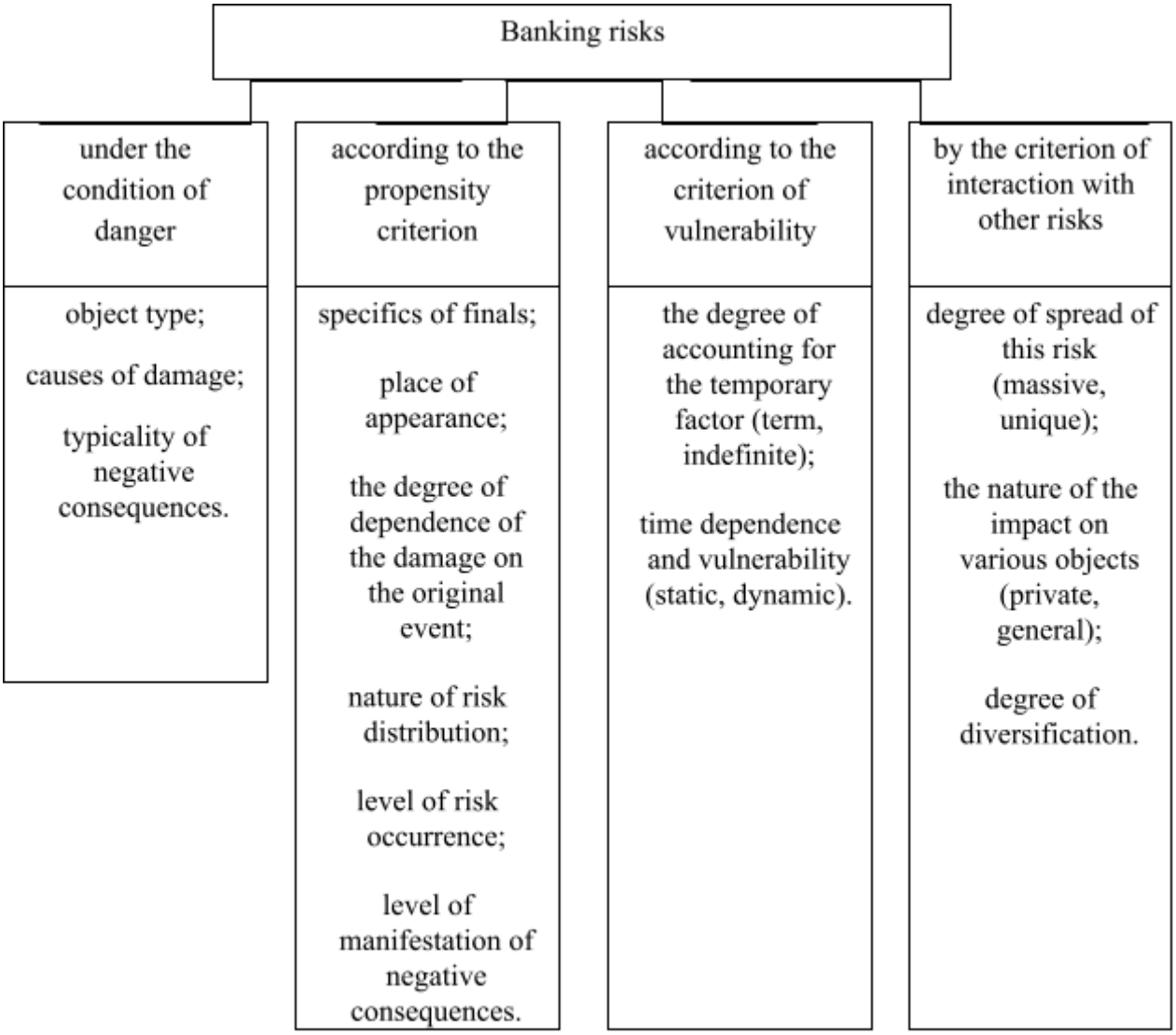


Fig. 1.1. Classification of banking risks

According to the danger criterion:

- object type;
- causes of damage;
- typicality of negative consequences.

According to the danger criterion, banking risks can include: financial risks, which in turn are divided into two types of risks - pure and speculative [18, p. 35], as well as risks of loss of profitability. Pure and speculative risks reflect the nature of the provision of banking services and operations carried out by the bank. When conducting credit, deposit and currency transactions, the bank assumes the risks

related to their conduct. Pure risks include: credit risk, solvency risk and liquidity risk.

Speculative risks include currency, interest and stock risks.

Currency risk is caused by fluctuations in the exchange rate of currencies, taking into account it is usually divided into commercial, translation and conversion risks.

Interest rate risk determines the potential susceptibility of the bank's financial condition to adverse changes in interest rates on financial markets. It should be noted that in various forms it affects almost all operations carried out by the bank, and is therefore associated with liquidity risk.

Fund risks arise when the bank conducts investment operations, which are characterized by fluctuations in the prices of market assets [18, p. 45]. Assets usually include securities, precious metals, and foreign currency.

According to the risk appetite criterion, they are classified into:

- specifics of finals (pure, speculative);
- place of appearance (internal, external);
- the degree of dependence of the damage on the original event (primary, secondary);
- nature of risk distribution (unilateral, bilateral, multilateral);
- the level of risk occurrence (risks arising at the level of the national economy, regional entities, individual economic entity);
- the level of manifestation of negative consequences (global, general economic, sectoral, project).

Internal and external risks are related to the factors causing their occurrence. External risks at the macro level include political, economic, social, demographic and geographic risks. Thus, political risks can be associated, for example, with the threat of a change in the political regime or a break in diplomatic relations with the country where the counterparty bank is located. Economic risks are associated with changes in the country's economy as a whole.

In turn, internal risks at the micro level are determined by the relationship between a specific bank and its clients. This type of risk can include: management, innovative and functional.

According to the vulnerability criterion, risks are classified by:

− degree of accounting for the temporary factor (term, indefinite);

− time dependence and vulnerability (static, dynamic).

According to the criterion of interaction with other risks, they are classified by:

− degree of spread of this risk (massive, unique);

− the nature of the impact on various objects (private, general);

− degree of diversification.

All the variety of typical banking risks covers all aspects of the bank's activities, which are inherently risky in the banking business. Depending on the type of transaction carried out by the bank, the type of banking product, the nature of interaction with the client, the banking risks to be taken into account will be different. This is typical for the bank's credit operations as part of its activities in the structure of the banking system of Ukraine.

The specificity of banking risks is due to the specialization that is unique to the bank and distinguishes it from other economic entities. And such functions, first of all, should include transformational ones. [45, p. 85]

In well-known works published in recent years and devoted to the field of banking activity and the theory of banking risks, various approaches to the selection of criteria and options for the classification of typical banking risks are given. Note that there is no single approach to the classification of banking risks and different researchers see it differently. Some researchers distinguish 4 categories of banking risks: financial, operational, business and extraordinary risks [70, p. 29]. Each of the categories contains, according to the researchers, several types of risks.

Another classification is proposed, which is based on the three-factor model of the risk classifier, which is a three-dimensional coordinate system [85, p. 87].

Each of the foundations is a basic characteristic of risk: the sources of risk, the values of the commercial organization exposed to risk, and the essential qualities of risks. Some researchers recognize the following as sources of risks:

- competition in the market niche;
- economic situation in the world, country, region, locality;
- social situation in the world, country, region, locality;
- political situation in the world, country, region;
- legal situation in the country and region;
- man-made situation that affects the commercial organization;
- natural disasters affecting the commercial situation;
- technological subsystem;
- economic subsystem;
- social subsystem;
- management subsystem.

The following are recognized as the values of a commercial organization exposed to risk:

- fixed assets;
- material resources;
- information resources;
- financial resources;
- human resources;
- management;
- rating;
- security.

Finally, the essential qualities of risks according to this model are:

- frequency of occurrence;
- probability of realization;
- predictability;
- scale of occurrence;
- time of action;

– the severity of the damage from the occurrence;

– possibility of risk diversification;

– possibility of risk insurance or management of non-insurance instruments.

The importance of these proposed models lies in the fact that they contain almost the full range of banking risks. Nevertheless, they do not fully meet the tasks of risk management in practice.

Identification of the factors of occurrence of the main risks identified by us (risk of liquidity, credit and currency risks), assessment of the scale of the expected loss caused by all types of these risks, as well as the selection and application of appropriate methods of prevention or sources of compensation for such possible loss and determine the content of the tasks that must be solved provide a banking risk management system. [54, p. 29]

Thus, the specifics of banking risks are due to the characteristic of only banking functions, primarily transformational, and distinguish the bank from other economic entities. The bank's successful resolution of these tasks directly depends on the efficiency and volume of its credit operations, as well as the possible levels of risks in their management.

## 1.2. Regulation of risks in banking at the legislative level

For a more detailed study of risks, in the next subsection, we will consider the legislative framework for regulating the activities of banks and controlling risks. This function is performed by the National Bank of Ukraine. It consists in the creation of a system of norms that regulate the activity of banks, determine the general principles of banking activity, the procedure for carrying out banking supervision, responsibility for violations of banking legislation.

The main goal of banking regulation and supervision is the safety and financial stability of the banking system, protection of the interests of depositors and creditors.

In Art. 1 of the Law of Ukraine "On the National Bank of Ukraine" [] defines banking regulation as one of the functions of the National Bank of Ukraine, which consists in creating a system of norms that regulate the activities of banks, determine the general principles of banking activity, the procedure for carrying out banking supervision, responsibility for violations of banking legislation . Article 66 of the Law of Ukraine "On Banks and Banking Activity" [60] defines the forms in which state regulation of bank activity is carried out.

Supervision based on risk assessment is an internal process of the National Bank of Ukraine, which is chosen to ensure greater consistency and efficiency of inspections and other types of supervisory activities. Banks with increased risk or areas of activity with increased risk parameters require more attention from the banking supervision service. The purpose of the NBU is to provide quality supervision aimed at identifying significant existing or potential problems in individual banks or in the banking system as a whole, as well as ensuring proper elimination of such problems [59, p. 111].

State regulation of banks in Ukraine is carried out on the basis of the Civil and Economic Codes, the laws of Ukraine "On the National Bank of Ukraine", "On banks and banking" [60], "On payment systems and money transfers in Ukraine", "On the principles of state regulatory policies in the field of economic activity", "On prevention and counteraction of legalization (laundering) of proceeds obtained through crime or financing of terrorism", "On joint-stock companies", etc.

The NBU defines bank risk by its impact on capital and income. Risk is the probability that events, expected or unexpected, may have a negative impact on the bank's capital and/or income [60].

In addition to the laws "About banks" and "About the NBU", the NBU's supervision of the activities of banks is regulated by the following basic normative acts: Decree of the Cabinet of Ministers of Ukraine dated February 19, 1993. No. 15-93 "On the 538 system of currency regulation and currency control", the Regulation on the planning and procedure of inspection inspections, approved by the NBU PP No. 276 dated 17.07.2001, the Regulation on the application of

measures of influence by the National Bank of Ukraine for violations of banking legislation, approved by PP of the NBU No. 369 dated August 20, 2001.

The means of state, including banking, regulation of banks' activities are established in separate normative acts of the NBU. These are: Instructions on the procedure for regulating the activities of banks in Ukraine, approved by PP NBU No. 368 dated August 28, 2001. (establishment of mandatory economic standards), Regulation on the procedure for formation of mandatory reserves for banks of Ukraine and branches of foreign banks in Ukraine, approved by PP of the NBU No. 91 dated 16.03.2006. (determining the norms of mandatory reserves). Such normative acts as the Regulation on the procedure for the formation and use of reserves by banks for the reimbursement of possible expenses from receivables, approved by PP of the NBU No. 505 dated 13.12.2002. (reserve for reimbursement of possible losses from receivables), Regulations on the procedure for the formation and use of a reserve for reimbursement of possible expenses for credit operations of banks, approved by PP of the NBU No. 279 dated 06.06.2000. (hereinafter - Regulations of the NBU No. 279), Regulations on the procedure for the formation of reserves for transactions of banks of Ukraine with securities, approved by PP of the NBU No. 31 dated 02.02.2007, will be valid until 31.12.2012, instead of them reserves for assets (for financial assets and receivables from the bank's business activities) and reserves for provided financial obligations will be regulated by the Regulation on the procedure for the formation and use of reserves by banks of Ukraine to compensate for possible losses in active banking operations, approved by the NBU's PP No. 23 of 01.25.2012. (hereinafter referred to as NBU Regulation No. 23 of January 25, 2012).

Also, the means of banking regulation are contained in the Regulation on the interest rate policy of the National Bank of Ukraine, approved by the NBU Regulation No. 389 dated 18.08.2004, the Regulation on the regulation of the liquidity of banks of Ukraine by the National Bank of Ukraine, approved by the NBU Regulation No. 259 dated 04.30.2009, the Regulation on opening and operation of correspondent accounts of resident and non-resident banks in foreign

countries currency and correspondent accounts of non-resident banks in hryvnias, approved by PP of the NBU No. 118 of March 26, 1998, etc.

Banking operations, in addition to the general requirements for them in the Law "On Banks", are regulated by the Civil Code of Ukraine, the Central Committee of Ukraine, the laws of Ukraine: "On Payment Systems and Transfer of Funds in Ukraine" dated 04/05/2001; "On the procedure for making calculations in foreign currency" dated September 23, 1994 p.; Regulations on the opening and functioning of correspondent bank accounts in foreign currency and hryvnias in authorized banks of Ukraine, approved by the NBU Executive Order No. 118 dated 26.03.1998 p., Instructions on the procedure for opening, using and closing accounts in national and foreign currencies, approved by the NBU Executive Order No. No. 492 dated 12.11.2003 p., Instruction on interbank transfer of funds in Ukraine in the national currency, approved by the NBU PP No. 320 dated 16.08.2006 p., the Instruction on non-cash settlements in Ukraine in the national currency, approved by the NBU PP No. 22 dated 21.01.2004 p. promissory notes in the national currency on the territory of Ukraine, approved by PP of the NBU no 508 dated 16.12.2002 p., other normative acts.

It should be taken into account that a significant role in the regulation of banking activity is played by banking customs - Art. 344 of the Civil Code of Ukraine (customs of business turnover - articles 526, 1059, 1068 of the Civil Code of Ukraine). Such as the Uniform rules and customs for documentary letters of credit (publication of the International Chamber of Commerce (hereinafter - ITC) 2007 No. 600), International Collection Rules (ITC publication No. 522, edition 1995 p.), Unified rules on contractual guarantees (ITC publication No. 325, edition 1978 p.), Unified rules for contractual sureties (ITC publication No. 524, edition 2000 p.), Uniform rules for guarantees on demand (ITC publication No. 758, edition 2010 p.).

In order to carry out the functions of banking regulation, the National Bank issues normative legal acts on matters falling under its authority, which are mandatory for state authorities and local self-government bodies, banks,

enterprises, organizations and institutions, regardless of the forms of ownership, as well as for natural persons Normative and legal acts of the National Bank are issued in the form of resolutions of the Board of the National Bank, as well as instructions, regulations, and rules approved by resolutions of the Board of the National Bank. They cannot conflict with the laws of Ukraine and other legislative acts of Ukraine and do not have retroactive effect, except in cases where they mitigate or cancel liability in accordance with the law. Regulatory acts of the National Bank are subject to mandatory state registration in the Ministry of Justice of Ukraine and enter into force in accordance with the legislation of Ukraine, and may also be challenged in accordance with the legislation of Ukraine [65, p. 29].

In order to protect the interests of depositors and creditors and ensure the financial reliability of banks, the National Bank, in accordance with the procedure determined by it, establishes mandatory economic standards for banks. These standards should ensure the control of risks related to capital, liquidity, lending, Capital Investments, as well as interest rate and currency risk. The National Bank officially notifies about further changes in standards and their calculation methods no later than one month before their implementation.

The National Bank determines the size, order of formation and use of bank reserves to cover possible loan losses, reserves to cover currency, interest and other bank risks. He does not have the right to demand from banks the execution of operations and other actions not provided for by the laws of Ukraine and normative acts of the National Bank.

In order to carry out its functions, the National Bank has the right to receive free of charge from banks, banking associations and legal entities that have received a license of the National Bank to carry out certain banking operations, as well as from persons in respect of whom the National Bank carries out supervisory activities in accordance with the Law of Ukraine "On banks and banking activities", information about their activities and explanations regarding the received information and conducted operations. For the preparation of banking and financial statistics, analysis of the economic situation, the National Bank has the

right to receive the necessary information free of charge from state authorities and local self-government bodies and business entities of all forms of ownership. The received information is not subject to disclosure, except for the cases stipulated by the legislation of Ukraine [67, p. 14].

In accordance with principles and standards generally accepted in international practice, the Instruction "On the Procedure for Regulating the Activities of Banks in Ukraine" was developed, approved by Resolution of the Board of the National Bank of Ukraine dated August 28, 2001 No. 368 [36]. It was put into effect in order to ensure the stable operation of banks and their timely fulfillment of their obligations to depositors, as well as to prevent improper allocation of resources and loss of capital due to the risks inherent in banking activities.

This Instruction, in accordance with the Laws of Ukraine "On the National Bank of Ukraine" and "On Banks and Banking Activities", the National Bank of Ukraine establishes the procedure for determining the bank's regulatory capital and the following economic standards, which are mandatory for all banks:

- capital standards: minimum size of regulatory capital, adequacy of regulatory capital (solvency), ratio of regulatory capital to total assets;

- liquidity standards: instant liquidity, current liquidity, short-term liquidity;

- credit risk standards: the maximum amount of credit risk per counterparty, large credit risks, the maximum amount of loans, guarantees and sureties granted to one insider, the maximum aggregate amount of loans, guarantees and sureties granted to insiders;

- investment regulations: investment in securities separately for each institution, of the total investment amount;

- the risk standard of the bank's total open (long/short) currency position.

The above provides grounds for asserting that the influence of the state on the activity of banks is of a regulatory nature. State regulation of the activity of banks is an influence on the activity of banks, which is carried out on behalf of the state by authorized state bodies, which consists in the implementation of normative

regulation of the bases of their activity, ensuring the possibility of their functioning and implementing direct regulation in this area.

When assessing risks using a risk assessment system, supervisors determine the level of concern (ie aggregate risk) and direction of risk for each risk category. The respective conclusions of the supervisory bodies determine which supervisory measures will be used, for example, scheduled inspection, unscheduled inspection, on-site inspection measures, etc.

The application of risk management methods and criteria enables the supervisory authorities to determine which program of supervisory actions should be developed for the bank.

## 1.3. Characteristics of the bank's system and diagnostic methods for the purpose of implementing an effective risk management policy

The practical world and national experience of the functioning of financial systems proves that the existing systems for diagnosing and preventing bankruptcy of banking institutions, as well as the methods of rating agencies for determining the reliability rating of commercial banks, are not always able to timely recognize the signs of bankruptcy at an early stage and predict the further development of the crisis situation.

According to the results of studies conducted by specialists of the Bank of International Settlements, four types of systems for diagnosing the state of the banking system are determined by formal characteristics:

1) rating systems;

2) systems of financial ratios and group analysis;

3) complex systems for assessing banking risks;

4) economic and mathematical models.

Rating systems make it possible to assess the state of banking institutions and identify problem banks. However, rating systems are based on data from a specific period of time, are static, not sufficiently detailed, do not take into account

all factors that affect the financial condition of banks, therefore they are actually unable to assess the level of financial stability of banks.

Systems of financial ratios and group analysis determine the financial condition of banks with the help of financial ratios that mainly measure capital adequacy, asset quality, profitability, liquidity. Based on the results of the analysis, banks whose indicators have deteriorated, as well as the state of the banking system as a whole, are revealed. Such a system can be used for stress testing to assess the state of the bank in the event of worsening financial conditions and economic conditions. The disadvantages of this system include limitations in determining the weight of one or another coefficient by an expert method, since the dynamism of changes is not taken into account when fixing the weight, which can reduce the effectiveness of assessing the state of the system [25, p. 29].

Comprehensive banking risk assessment systems make it possible to assess the risks of a bank or a group of banks by divisions and functional characteristics. Risks are assessed according to a number of criteria, for each of which points are assigned, which are aggregated into the final assessment of the bank or group. Comprehensive banking risk assessment systems are convenient for assessing large national and international banks and banking groups with diversified business.

In order to regulate the level of risks, the National Bank of Ukraine establishes economic liquidity standards (H4 - H6) and credit risk standards (H7 - H10) [60].

The standard of instant liquidity (H4) is defined as the ratio of highly liquid assets to the bank's current liabilities. It characterizes the minimum volume of highly liquid assets necessary to ensure the fulfillment of current obligations during one operating day. The normative value of the H4 coefficient should be at least 20%.

The current liquidity ratio (H5) is defined as the ratio of assets with a final maturity of up to 31 days to the bank's liabilities with a final maturity of up to 31 days. This norm characterizes the minimum required volume of bank assets to

ensure the fulfillment of the current volume of obligations within one calendar month. The normative value of the H5 coefficient should be at least 40%.

The norm of short-term liquidity (H6) is defined as the ratio of liquid assets to liabilities with a final maturity of up to one year. It determines the minimum required amount of assets to ensure the fulfillment of its obligations within one year. The normative value of the H6 coefficient should be at least 60%.

The norm of the maximum amount of credit risk per counterparty (H7) is established in order to limit the credit risk arising as a result of individual counterparties not fulfilling their obligations.

The amount of credit risk per counterparty is defined as the ratio of the sum of all the bank's claims to this counterparty and all off-balance sheet liabilities issued by the bank in relation to this counterparty (group of related counterparties) to the bank's regulatory capital. The value of standard H7 is no more than 25%.

The norm of large credit risks (H8) is established in order to limit the concentration of credit risk for a single counterparty or a group of related counterparties.

The credit risk assumed by the bank on one counterparty or a group of related counterparties is considered large if the sum of all the bank's claims to this counterparty (group of related counterparties) and all off-balance sheet obligations provided by the bank in relation to this counterparty or group of related counterparties, is 10% or more of the regulatory capital of the bank.

H8 is defined as the ratio of the sum of all large credit risks provided by the bank to all counterparties, including all off-balance sheet liabilities issued by the bank to these counterparties, to the bank's regulatory capital.

The standard value of standard H8 should not exceed 8 times the size of the bank's regulatory capital.

The norm of the maximum amount of loans, guarantees and sureties provided to one insider (H9) is established in order to limit the risk that arises during transactions with insiders, which may lead to a direct or indirect impact on the bank's activities.

Norm H9 is calculated as the ratio of the sum of all liabilities of this insider (group of related insiders) to the bank and all off-balance sheet liabilities issued by the bank in relation to this insider, and the authorized capital of the bank. The normative value of the H9 coefficient should not exceed 5%.

The norm of the maximum aggregate size of loans, guarantees and sureties provided to insiders (H10) is established in order to limit the aggregate amount of all risks to insiders.

Norm H10 is calculated as the ratio of the total indebtedness of the liabilities of all insiders to the bank and 100% of the amount of off-balance sheet liabilities issued by the bank to all insiders and the authorized capital of the bank. The normative value of the H10 coefficient should not exceed 30%.

Practical calculations of these standards will be considered in the second section of the study.

For effective management of banking risks, it is advisable to use quantitative regression analysis.

Quantitative regression analysis is a development of paired regression analysis for cases where the dependent variable is hypothetically related to two or more independent variables. Most of the analysis is related to the extension of the paired regression model. It allows distinguishing the influence of independent variables, allowing at the same time the possibility of their correlation[35].

At the stage of mathematical and statistical analysis, the main assumptions of classical regression analysis are checked, in addition, the most important procedure of multifactor analysis is carried out - checking factors for multicollinearity. The term "multicollinearity" means that in a multivariate regression model two or more independent variables (factors) are linearly related or, in other words, have a high degree of correlation.

To carry out mathematical and statistical analysis, a matrix of pairwise correlation coefficients is built, which shows the degree of connection between the factors of the econometric model. Then the pairwise correlation coefficients between the factors are analyzed. The result of the stage of mathematical and

statistical analysis is the finding of a set of main independent factors, which is the basis for building a regression model.

At the second stage, the "step-by-step" method and the "exclusions" method were widely used to build a multifactor model. The essence of the "step-by-step" method is that factors are included in the model one by one until it becomes satisfactory. The order of inclusion is chosen using the correlation coefficient as a measure of the importance of factors (independent variables) that are not yet included in the model. This method involves the calculation of partial F-criteria for factors that had a significant impact on the performance indicator. Next, the indicators that exerted the greatest influence on the performance indicator are determined, the values of the partial F-criteria exceed the normative values.

The method of "exclusions" consists in choosing a set of factors that can probably affect the performance indicator. Then, one by one, those factors with the smallest correlation coefficient (according to the statistics matrix) and the values of the partial F-criteria do not exceed the normative values are excluded. Thus, only those variables that meet the conditions discussed above will remain.

It should be said that at this stage the coefficient of multiple correlation (1) is calculated, which shows the general influence of independent factors on the resulting indicator of the econometric model. It is in the interval between 0 and 1. The greater the influence of factors, the more the coefficient of multiple correlation approaches 1. But it cannot exceed the value of the latter.

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{n\sigma_x\sigma_y} \qquad (1.1)$$

At the next stage of the analysis, the adequacy of the model is checked using Fisher's F-test (1.2) and Student's t-test (Appendix D). When checking the adequacy of the econometric model, the Durbin-Watson test is also used, which helps to check the model for homo- or heteroscedasticity.

$$\sigma_e^2 = \frac{\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}{n} \quad (1.2)$$

At the last stage, the obtained model is analyzed and interpreted.

Statistical assessment of the reliability of the regression coefficient is carried out using the Student's t-test. It is used to assess the closeness of the relationship between the independent variable x and the dependent variable y. When using this criterion, a null hypothesis is formulated. Then the obtained value of Student's t-distribution is compared with the critical value. If the actual value of the Student's t-distribution exceeds the critical value, then the null hypothesis is rejected and the relationship between the variables x and y is considered tight. If not, then the null hypothesis is accepted, and the factors of the model are considered statistically inadequate and excluded from the model at the established significance level of 5 and 1% [24, p. 459].

The F-test (1.3) is used to assess whether the explanation given by the equation as a whole is significant. If the actual value of the F-criterion is higher than the normative value, then the model is adequate, and its factors remain in the equation.

$$F_{1,n-2} = \frac{\frac{\sum_{i=1}^{n}(\hat{y}_i - \bar{y})^2}{\sum_{i=1}^{n}(\hat{y}_i - y_i)^2}}{n-2} \quad (1.3)$$

To check the adequacy of the econometric model, the Durbin-Watson test is used, which is aimed at checking the correlation between the residuals.

To assess the adequacy of the model, it is important to check it for homo- or heteroskedasticity.

Testing of the model for heteroscedasticity is carried out on the basis of Spearman's rank correlation test (1.4). The significance of the obtained Spearman's rank correlation coefficient is checked using the Student's t-test with (n-2) degrees of freedom.

$$p = \frac{\sum_i (x_i - \vec{x})(y_i - \bar{y})}{\sqrt{\sum_i (x_i - \vec{x})^2 \sum_i (y_i - \bar{y})^2}} \quad (1.4)$$

At the stage of analysis of the obtained results, the economic interpretation of the obtained econometric model is carried out. At this stage, the economic feasibility of the obtained results is substantiated.

It is necessary to understand that the use of only one diagnostic system is not effective and the leading countries of the world use them in a complex manner.

The differences between the systems for diagnosing the state of the banking system are due to the characteristics of countries: their historical development, the functioning of the financial system, the concentration of credit institutions, the development of the banking system and the financial system as a whole; availability and nature of statistical information, availability of other reliable sources of information, level of technical support, etc.

As a rule, the country uses several systems for assessing risks and diagnosing bankruptcy, since some systems assess already existing problems, while others - on the basis of existing risks, make it possible to predict the future situation. The use of several systems increases the probability of identifying a problem bank.

In today's conditions, the issue of developing effective domestic risk monitoring systems and the financial condition of banking institutions is gaining particular relevance, since foreign experience due to the existence of objective reasons is not always acceptable in domestic conditions and requires certain adjustments and taking into account a number of other indicators.

# CHAPTER 2
# FINANCIAL STATE DIAGNOSTICS AND ANALYSIS OF FINANCIAL RISKS OF THE BANKING INSTITUTION AS PREVAILING ON THE EXAMPLE OF "MR BANK" JSC

## 2.1. The method of in-depth analysis of the bank's financial condition with the help of financial indicators

The financial condition of the bank is a complex concept that reflects a system of indicators that characterize the availability, placement and use of financial resources.

Domestic commercial banks should move to a qualitatively new stage of development, which is characterized by the process of transformation of the bank management system. For this, in turn, it is necessary to get rid of the usual standards regarding the choice of management methods and learn to apply modern methods of analytical research. Under modern conditions, the role and importance of economic analysis in the activity of banks is also growing due to the need to investigate and take into account the factors of the external environment.

The organization and conduct of economic analysis in a commercial bank is based on the general methodology of practical (professional) analytical work, the content of which is based on the theory of economic analysis. The principles of economic analysis regulate the procedural side of its methodology and techniques. These include: systematicity and complexity, periodicity, clarity and adequacy of interpretation, reliability and objectivity, appropriateness and timeliness.

Banking institutions of Ukraine conduct a financial analysis of their activities based on the requirements of the "Instructions on the procedure for regulating and analyzing the activities of banks in Ukraine". approved by the resolution of the Board of the National Bank of Ukraine dated August 28, 2001 No. 368 and registered in the Ministry of Justice of Ukraine on September 26,

2001 under No. 841/6032, with changes established the economic norms for regulating the activities of banks, the order of their calculation and their normative values, which are mandatory for the implementation of all banks

In accordance with the Law of Ukraine "On Banks and Banking Activities" with the aim of protecting the interests of clients and ensuring the financial reliability of banks National Bank of Ukraine establishes economic standards for all commercial banks [60]. They include:

- capital norms. They are represented by the regulatory capital, the adequacy of the regulatory capital to the minimum amount of the authorized capital; solvency and capital adequacy of the bank.

- liquidity norms, which are characterized by instant liquidity; general liquidity; the ratio of highly liquid assets to the working assets of the bank;

- in addition, according to the current legislation, risk norms are also monitored, which include: the maximum amount of risk for one borrower; norm of "big" credit risks; the maximum amount of loans, guarantees and sureties provided to one insider; the maximum total amount of loans, guarantees and sureties provided to insiders; the maximum amount of granted interbank loans; the maximum amount of received interbank loans; investment; general open currency position of the bank; long (short) open currency position in a freely convertible currency; long (short) open currency position in non-convertible currency; long (short) open currency position in all bankable metals.

The method of calculating the economic norms for regulating the activities of banks in Ukraine and their normative values are established by the Instruction on the procedure for regulating the activities of banks in Ukraine.

To analyze the financial condition of AT "INTERNATIONAL RESERVE BANK» (hereinafter - the Bank) reviewed the general indicators of the balance sheet for 2019-2021. The indicators of the asset and liability balance are given in the table. 2.1 and table 2.2 respectively.

Table 2.1

Indicators of assets of the balance sheet of JSC "MR BANK"

| Asset article | Value by years | | | Growth in 2019 - 2020 thousand UAH | Increase 2020 - 2021 thousand UAH |
|---|---|---|---|---|---|
| | 2019 thousand UAH | 2020 thousand UAH | 2021 thousand UAH | | |
| 1. Non-current assets | 2639 | 2670 | 3886 | 31 | 1216 |
| 2. Current assets | 35074 | 46791 | 51633 | 11717 | 4842 |
| Conclusion | 37713 | 49461 | 55519 | 11748 | 6058 |

Table data. 2.1 evidence of an increase in non-current assets in 2021. compared to 2020, which has a positive trend, because the change in non-current assets directly affects the total value of the bank's assets. As for current assets, an increasing trend is observed over the analyzed period. Such changes have a positive effect on the work of the bank, because they indicate the expansion of its activities. The difference in dynamics can be connected with the unstable economic situation in the country. These changes were also significantly reflected in the bank's balance sheet as a whole.

Table 2.2

Indicators of the liability balance of JSC "MR BANK"

| Passive article | Value by years | | | Growth in 2019-2020 thousand UAH | Increase 2020 - 2021 thousand UAH |
|---|---|---|---|---|---|
| | 2019 thousand UAH | 2020 thousand UAH | 2021 thousand UAH | | |
| 1. Own capital | 4730 | 4263 | 2719 | -467 | -1544 |
| 2. Long-term obligations and collateral | 10876 | 25015 | 32589 | 14139 | 7574 |
| 3. Current liabilities and guarantees | 1673 | 20183 | 20211 | 18510 | 28 |
| Conclusion | 479467 | 49461 | 55519 | 32182 | 6058 |

Regarding the passive indicators, which are given in the table. 2.2, it can be noted that for the considered period, a decrease in the share of own capital is observed for the entire considered period, which indicates a weakening of the

financial stability of the enterprise due to own funds and an attempt to increase it due to the increase in long-term and short-term liabilities for the period 2019-2021.

Thus, looking at the main indicators of the bank, it can be concluded that its condition has deteriorated compared to previous years. An important condition for determining the right steps in the risk management policy of a financial institution is to understand the financial stability of the company. A number of indicators have been developed to characterize it.

Let's calculate some of them for "MR BANK" (Table 2.3). In view of the conducted studies, it can be concluded that the state of the bank can be characterized as good. However, it can be seen from the calculations that Sberbank is quite dependent on external borrowing, as evidenced by the low coefficient of autonomy, an increase in the coefficient of dependence and a significant indicator of financial leverage. But fairly good indicators of financial stability and stability testify to the maintenance of the bank's financial condition at a high level.

Table 2.3

Indicators of financial stability of JSC "MR BANK"

| The name of the indicator | 2019 | 2020 | 2021 |
|---|---|---|---|
| Coefficient of autonomy | 0.49 | 0.39 | 0.40 |
| Coefficient of financial dependence | 0.51 | 0.61 | 0.60 |
| Coefficient of financial stability | 0.87 | 0.70 | 0.75 |
| Indicator of financial leverage | 0.96 | 1.12 | 1.13 |
| Coefficient of financial stability | 0.87 | 0.89 | 0.87 |
| Loan capital concentration ratio | 0.5 | 0.55 | 0.56 |

It is also necessary to carry out an analysis of the bank's business activity. It is characterized by its ability to attract funds and effectively deploy them.

Business activity determines the level of attracting liabilities and the level of their use in assets, therefore, first of all, it is advisable to use the results of the analysis of the bank's balance sheet and compare the interrelated items of assets and liabilities, paying attention to the trends of their changes in the studied period. The largest measure of the level of the bank's business activity on the financial

market is a group of indicators that are found using a ratio analysis, the results of which are summarized in Table 2.4.

Table 2.4

Coefficient analysis of business activity of JSC "MR BANK"

| Indicator (optimal value) | By the end of 2019 | By the end of 2020 | By the end of 2021 |
|---|---|---|---|
| Activity coefficient of attraction and borrowing of funds (0.7 - 0.85) | 0.91 | 0.87 | 0.88 |
| Deposit attraction activity coefficient (0.6 - 0.7) | 0.68 | 0.73 | 0.63 |
| The coefficient of activity of attraction of term deposits (0.4 - 0.5) | 0.29 | 0.29 | 0.29 |
| The coefficient of activity of attracting funds to the question (0.2 - 0.3) | 0.29 | 0.44 | 0.33 |
| The activity coefficient of the involvement of MBK (0.15-0.2) | 0.16 | 0.09 | 0.21 |
| Resource utilization activity rate (0.8-1) | 0.91 | 0.97 | 0.93 |
| Deposit base usage activity ratio (> 1) | 1.17 | 1.15 | 1.30 |
| The coefficient of activity of investing resources in the loan portfolio (> 0.8) | 0.83 | 0.96 | 0.93 |
| The coefficient of activity of making time deposits in the credit portfolio (2-2,2) | 2.42 | 2.86 | 2.78 |
| The coefficient of productive use of business assets (0.7 - 0.8) | 0.79 | 0.85 | 0.83 |
| Investment ratio in the loan portfolio (0.6-0.75) | 0.8 | 0.85 | 0.82 |
| Investment ratio in securities and joint economic activity (0.3-0.35) | 0.008 | 0.005 | 0.003 |

Based on the fact that a significant part is within the limits of the standards, and some exceed them, the bank has high business activity, and its policy is approaching aggressive, as evidenced by the excess of the coefficients of the left limit of the optimal values, which may threaten the financial stability of the bank. Problems in the business activity of JSC "MR BANK" are observed only in the direction of placing funds in securities and attracting time deposits.

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Problems in the business activity of JSC "MR BANK" are observed only in the direction of placing funds in securities and attracting time deposits.

Liquidity of a commercial bank is the ability and ability of the bank to fulfill its obligations to customers, creditors, investors, shareholders and other counterparties in the analyzed periods.

Liquidity of the balance sheet as the degree of coverage of liabilities by assets and liquidity of the assets themselves is ensured by compliance with mandatory economic standards of the NBU. In the absence of the necessary information to determine all regulatory indicators, we evaluate the bank's liquidity in terms of its ability to convert assets into cash to repay its obligations (immediately or in the near future) based on the following block of indicators (table 2.5).

Table 2.5

Ratio analysis of liquidity of MR BANK JSC

| Indicator (optimal value) | 2019 | 2020 | 2021 |
|---|---|---|---|
| Instant liquidity ratio (> 0.2) | 0.20 | 0.22 | 0.36 |
| Ratio of highly liquid assets (0.15-0.2) | 0.9 | 0.10 | 0.12 |
| Mobility coefficient of highly liquid assets (0.6 - 0.7) | 0.69 | 0.61 | 0.47 |
| Liquidity ratio of working assets (0.2 - 0.25) | 0.3 | 0.10 | 0.13 |
| The ratio of total liquidity of the bank's liabilities (>1) | 1.02 | 1.05 | 1.06 |
| General liability liquidity ratio (0.3 - 0.4) | 0.14 | 0.16 | 0.19 |
| Liquidity ratio of issued loans and attracted deposits (1.3 - 1.5) | 1.16 | 1.14 | 1.30 |

In general, such a situation is noticeable. According to the coefficient of resource liquidity of obligations, we see that the calculated values exceed the right limit of optimal values, this indicates a high level of liquidity, and therefore the bank's solvency. Such ratios as the ratio of instant liquidity, the ratio of total liquidity of the bank's liabilities are normal. And the rest of the indicators received values smaller than the left limit of the optimal values, but there are tendencies to improve them (in dynamics, they increase). Such a situation probably indicates a high business activity of the bank and a desire to increase the level of profitability, but it may lead to the loss of the ability to perform its customer service functions.

The most significant indicators that reflect the level of efficiency of the bank's activity, the perfection of its financial policy, professionalism and coherence

in the work of managers are the indicators of profitability and profitability of the bank, calculated in table 2.6.

Table 2.6

Coefficient analysis of profitability and profitability of the bank

| Indicator (optimal value) | By the end of 2019 | By the end of 2020 | By the end of 2021 |
|---|---|---|---|
| Overall rate of return (> 10%) | 0.18 | 0.16 | 0.09 |
| Cost effectiveness (> 20%) | 0.15 | 0.14 | 0.07 |
| Return on capital (> 15%) | 0.19 | 0.12 | 0.07 |
| Return on assets (> 1%) | 0.01 | 0.01 | 0.01 |
| Net interest margin (> 10%) | 0.7 | 0.05 | 0.06 |
| Spread (gap of interest profit) (> 5%) | 0.05 | 0.05 | 0.05 |
| Net non-interest margin ("burden" of the bank) (> 0) | -0.02 | -0.08 | -0.09 |
| "Dead point" of the bank's profitability (the closer to 0, the better) | 0.09 | 0.09 | 0.09 |
| Cost recovery by income (> 1) | 1.61 | 1.14 | 1.07 |
| Multiplicative effect of capital | 0.14 | 0.10 | 0.03 |
| Added value, UAH. (> 0) | 498534.29 | 387349.17 | 179147.87 |

Therefore, after conducting an analysis and evaluating the effectiveness of the bank's activity, we can conclude that the bank functioned effectively before the crisis, and the decrease in the profitability of the bank's activity is not related to the deterioration of the level of management, but to problems in the entire banking system of Ukraine.

The calculations were performed on the grounds that successful management of any level is impossible without a detailed analysis of the results of past activities, determination of perspectives and guidelines for the future, and the search for effective ways to achieve the set goal, that is, without appropriate analytical support. Under modern economic conditions, when multivariateness, the possibility of choice, competition and the search for methods to overcome it become an objective reality, the role and importance of economic analysis in the activity of banks is growing significantly. Economic analysis is considered as an integral part of the management process at both the micro and macro levels. On the one hand, trust in the bank is based on the results of the analysis of its financial

statements, and on the other hand, the formation of an effective management system is impossible without the creation of appropriate analytical support in the bank itself.

## 2.2. Analysis of the dynamics of changes in the level of financial risks of JSC "MR BANK "

The sustainable development of a modern bank depends on choosing the optimal strategy, rational market positioning and building an effective financial management system. The main elements of the financial management system are: formation of the optimal structure of the bank's assets and liabilities, forecasting of balance sheets, reports on financial results, financial plans and budgets; risk management; price policy regulation and cost management.

For foreign banking institutions, the formation of a comprehensive risk management system is an integral element of management, which cannot be said for domestic banks. The rapid change in market situations makes it urgent to manage all types of risk, which become critical in times of crisis.

A comprehensive risk management system should also provide for the development of internal bank regulatory documents, which must reflect: the mission of the banking institution; the bank's goals, objectives and strategy for risk management; concepts of risk management in the bank; policies regarding the management of individual risk categories and business plans for their implementation; regulatory documents of collegial bodies, functional and territorial divisions, job descriptions, limits and powers [11].

Since the market conditions and structures of banks are different, each institution must develop its own risk management program and systems, according to its needs and circumstances. Thus, a larger bank that has divisions in different geographical regions, performs more complex operations, should have a more sophisticated and developed risk management system [12].

The complex system is currently the most effective, as it includes the largest number of factors for analysis, which makes it possible to draw more accurate and relevant conclusions.

The activity of each financial institution is always at a high level of risk. It is because of the negligent attitude to the timely assessment of financial risks that most Ukrainian commercial banks faced financial problems. The most common way to avoid risk is to refuse those operations that cause it, which in turn forces you to refuse the profit that the bank expects. Thus, there is a reasoned need to identify the real level of financial risks, among which currency, credit and liquidity risks are the most common.

Credit risk is an existing or potential risk to income and capital that arises due to the inability of the obligee to fulfill the terms of any financial agreement with the bank or otherwise fulfill the obligations assumed [11].

When assessing credit risk, a distinction is made between individual and portfolio credit risk. A source of individual credit risk. there is a separate, concrete counterparty of the bank - borrower, debtor, issuer of securities. The assessment of individual credit risk involves an assessment of the creditworthiness of an individual counterparty, that is, its individual ability to settle its obligations in a timely manner and in full.

Portfolio credit risk is manifested in a decrease in the value of the bank's assets (other than as a result of changes in the market interest rate). The source of portfolio credit risk is the bank's aggregate indebtedness for operations that are subject to credit risk, such as a loan portfolio, securities portfolio, receivables portfolio, etc. The assessment of portfolio credit risk involves an assessment of the concentration and diversification of the bank's assets [12].

By implementing the function of banking supervision, the NBU controls credit risk by establishing the appropriate standards H7-H10 (the ratios for calculation are specified in point 1.3 of this study).

For a visual assessment of the level of credit risk, we will consider the indicators of standards H7-H10 JSC "MR BANK" (Fig. 2.1):

– standard of the maximum amount of credit risk per counterparty (H7) – 11.26% (normative value of H7 no more than 25%);

– the norm of large credit risks (H8) 32.08% (the maximum value of the norm of H8 is no more than 80%);

– the norm of the maximum amount of loans, guarantees and sureties provided to one insider (H9) – 0.24% (the maximum value of the norm of H9 is no more than 5%);

– the norm of the maximum aggregate amount of loans, guarantees and sureties provided to insiders (H10) is 1.81% (the maximum value of the norm of H10 is no more than 30%) [12].

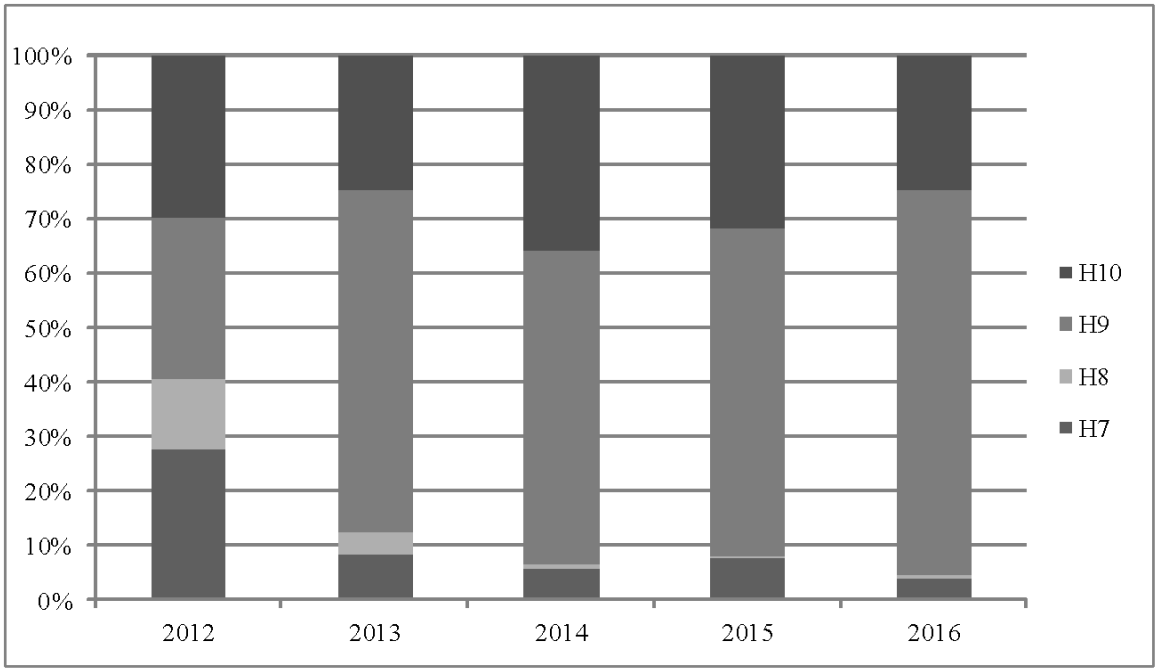


Fig. 2.1 Implementation of credit risk standards of JSC "MR BANK"

Thus, standard H8 has the largest fluctuation range (increased by 9.04% compared to 2020, and compared to 2012 by 21.81%). And at the same time, it does not significantly affect the state of credit risk, since it is still far from its maximum value. During the five analyzed years, the bank complied with the standards every year.

In addition, the bank has introduced a procedure for checking credit quality, which is carried out by periodically reviewing the size of the corresponding collateral.

Liquidity risk is an existing or potential risk to income and capital that arises from the bank's inability to meet its obligations in a timely manner without incurring unacceptable losses. Liquidity risk arises due to the inability to manage unplanned outflows of funds, changes in funding sources, or to fulfill off-balance sheet obligations [12].

In its activities, JSC "MR BANK" uses various methods and approaches to assess liquidity risk, guided by the requirements of the National Bank of Ukraine. In particular, on a regular basis, a report on the discrepancy between assets and liabilities by maturity is formed and relevant gaps are investigated at time intervals. But such a report does not fully reflect the real income and outflow of cash flows. The Bank additionally monitors the behavior of products without a predetermined maturity date (customer current accounts, bank correspondent accounts), as well as term products for which extension is possible in order to determine the impact on liquidity.

We will analyze the changes in liquidity standards (the ratios for calculation are indicated in point 1.3 of this study) for 2012-2021. with the help of fig. 2.2.:

- standard of instant liquidity (H4) – 43.41% for a standard of at least 20% (at the beginning of the year – 48.22%);

- the standard of current liquidity (H5) – 45.31% for a norm of at least 40% (at the beginning of the year – 77.25%);

- short-term liquidity ratio (H6) – 73.80% for a norm of at least 60% (at the beginning of the year – 77.29%).

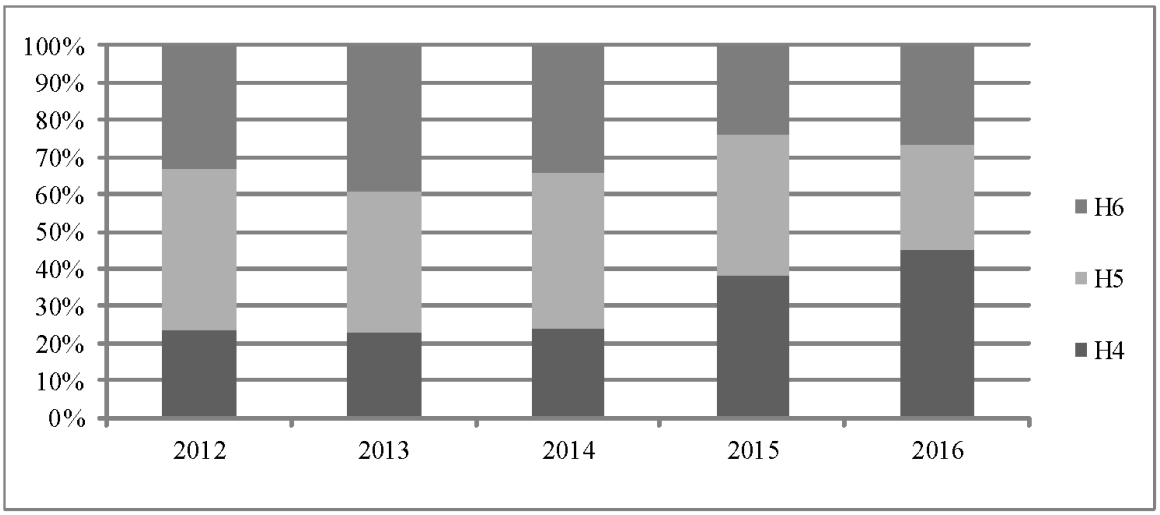


Fig. 2.2. Compliance with liquidity standards of JSC "MR BANK"

As you can see, the standard of current liquidity has undergone significant changes, it decreased by 31.94% compared to 2020. However, it is still within acceptable limits. During 2012-2019 standard H6 was less than 60%, but then the requirements for this standard were lower and amounted to at least 20%.

Currently, the negative impact of currency risk is becoming more and more significant for banking institutions.

Currency risk is an existing or potential risk to income and capital arising from adverse fluctuations in foreign exchange rates and prices of bank metals. Currency risk is divided into: transaction risk; risk of conversion from one currency to another (translation risk); economic currency risk [12].

The evaluation of the bank's foreign exchange risk consists in the fact that the value of the risk is determined on the basis of the quantitative values of the probability of its occurrence and the scale of the consequences. Among Ukrainian banks, the VaR methodology is the most common for assessing currency risk.

The VaR indicator is calculated according to the formula (2.1):

$$VaR = m * T \pm k_a * \sigma * \sqrt{T} \quad (2.1)$$

where m is the average daily exchange rate change; σ – root mean square deviation of one-day percentage changes in the exchange rate; $k_a$ is a correction

coefficient, the value of which depends on the level of reliability α (for example, for α=0.99 $k_a$ = 2.33); T is a time period. [12]

The use of VaR methods in conditions of significant volatility of currencies does not allow to adequately assess the currency risk due to the fact that most economic processes do not develop according to the law of normal distribution, on which the VaR calculation is based.

The following parameters and assumptions were used to calculate the VaR indicator of MR BANK JSC:

1) Time horizon: 1 day and 10 days.

2) The level of acceptable risk is 99% (for banks in accordance with the Basel documents).

3) The base currency is the national currency (Ukrainian hryvnia), in which the open currency position will be recalculated in US dollars, euros and pounds sterling.

4) The size of the currency position is presented:

– USD - 211,275 thousand UAH in equivalent;

– EUR - 74,506,000 UAH equivalent;

– in pounds sterling - 44,602 thousand UAH equivalent;

–for other currencies in the amount of 2,123 thousand UAH, the structure of which is unknown, and the share of which is insignificant, the VaR calculation was not carried out.

The US dollar is the riskiest currency in the bank's portfolio, due to its significant share compared to other currencies. In this regard, diversification of the currency portfolio may be a possible way to reduce the degree of currency risk.

Therefore, it is advisable to introduce the CVaR method to supplement the toolkit for assessing foreign exchange risk based on the VaR method. This method makes it possible to calculate the risk of exceptional losses outside of VaR and, on this basis, to form optimization algorithms that can be implemented using linear programming.

JSC "MR BANK" sets limits for each currency separately and for the total open currency position in order to meet the acceptable level of currency risk. In order not to suffer significant losses after revaluation of the open currency position, daily control over income and expenses is carried out. Values of VaR limits for currency risk are systematically investigated. In addition, the analysis of foreign currency exchange rate fluctuations and their impact on the liquidity and capital report is carried out [12].

Based on the results of the financial risk assessment of the commercial bank "INTERNATIONAL RESERVE BANK" JSC, it can be concluded that it conducts an effective policy of financial risk management, which allows it to timely avoid financial losses and fulfill its obligations to clients.

## 2.3. Forecast of required reserve amounts at the NBU as a method of financial risk management

In many studies, it turns out that some outcome characteristic changes under the influence of not one, but several factors. In particular, while analyzing the bank's activity and forecasting its further development, the amounts of the mandatory reserve at the NBU are investigated.

We will build a linear multifactor econometric model based on data on the amount of the required reserve at the NBU and factors that can affect it (Table 2.7).

Table 2.7

Initial indicators of the studied data

| | Quarters | Mandatory reserve at the NBU, thousand UAH | Loans and advances to customers, thousand UAH | Funds of individuals, thousand UAH |
|---|---|---|---|---|
| | | Y | X1 | X2 |
| 1 | 1q. 2019 | 2638950 | 20591613 | 12755773 |
| 2 | 2 q. 2019 | 2767688 | 23458337 | 13936631 |

| | | | | |
|---|---|---|---|---|
| 3 | 3 q. 2019 | 3204396 | 24311863 | 14279032 |
| 4 | 1 q. 2020 | 3342741 | 34946156 | 16567709 |
| 5 | 2 q. 2020 | 3416404 | 34942604 | 14079091 |
| 6 | 3 q. 2020 | 3849209 | 34695920 | 12105678 |
| 7 | 1 q. 2021 | 4188798 | 48288994 | 13877502 |
| 8 | 2 q. 2021 | 4864679 | 39551966 | 12449020 |
| 9 | 3 q. 2021 | 5776168 | 40162129 | 13076721 |

Such analysis is a development of paired regression analysis for cases where the dependent variable is hypothetically related to two or more independent variables. Most of the analysis is related to the extension of the paired regression model.

For all the necessary calculations, we will use the PortableStatistica 8 package.

Let's check the statistical significance of the model parameters and the adequacy of the model according to Fisher's test. The results of building the model are shown in fig. 2.3.

| N=9 | Regression Summary for Dependent Variable: Y (Spreadsheet1)<br>R= ,80656494 R?= ,65054700 Adjusted R?= ,53406267<br>F(2,6)=5,5848 p<,04267 Std.Error of estimate: 6959E2 | | | | | |
|---|---|---|---|---|---|---|
| | Beta | Std.Err. of Beta | B | Std.Err. of B | t(6) | p-level |
| Intercept | | | 4262055,526 | 2713292,61 | 1,5708 | 0,16728 |
| X1 | 0,73842 | 0,24137 | 0,083 | 0,027 | 3,0592 | 0,02224 |
| X2 | -0,31076 | 0,24137 | -0,238 | 0,185 | -1,2874 | 0,24536 |

Fig. 2.3. Results of multivariate regression analysis

The results of the analysis show that the correlation coefficient exceeds 0.75 (R=0.807), so it can be concluded that there is a close linear relationship. The coefficient of determination does not exceed this indicator (d=0.651), which indicates that the model is inadequate. In this case, 65.1% of the total change in the amount of required reserves at the NBU is explained by changes in loans and

advances and funds of individuals, while other factors account for 34.9% of the change.

The statistical significance of the model as a whole is checked using Fisher's test. According to the results of the regression analysis, it can be seen that the calculated value of F, which is equal to 5.5848, exceeds the tabular value of F(0.05;2;9), which is equal to 4.26, that is, the built model is statistically significant and the relationship between the dependent and explanatory variables are significant.

The results also show that there is a direct relationship between the variables Y and X1, that is, the greater X1, the greater Y. There is an inverse relationship between the variables Y and X2, as X2 increases, Y will decrease.

To test the hypothesis about the significance of the regression model, variance analysis is used.

The results of dispersion analysis for the studied model are shown in Fig. 2.4. This table shows the sum of squares of deviations by regression (Sums of Squares Regress), sum of squares of deviations of errors (Sums of Squares Residual), dispersion of errors (Mean Squares Residual) and Fisher's test (F).

| | Analysis of Variance; DV: Var1 (Spreadsheet1) | | | | |
|---|---|---|---|---|---|
| Effect | **Sums of Squares** | df | Mean Squares | F | p-value |
| **Regress.** | 5,408983E+12 | 2 | 2,704492E+12 | 5,584846 | 0,042674 |
| Residual | 2,905532E+12 | 6 | 4,842554E+11 | | |
| Total | 8,314515E+12 | | | | |

Fig. 2.4.Table of dispersion analysis

According to the results of the variance analysis, we can evaluate the model according to the Fisher criterion, which, as in the regression analysis, is equal to 5.5848 and significantly exceeds the table value. Therefore, the constructed model is adequate.

The next step in multivariate regression model research is to check for multicollinearity in the model.

One of the ways to check the model for multicollinearityis the calculation of the matrix of pairwise correlations. The matrix of pairwise correlation coefficients is shown in Fig. 2.5.

| Variable | Correlations (Spreadsheet1) | | |
|---|---|---|---|
| | **Var2** | Var3 | Var1 |
| **Var2** | 1,000000 | -0,018954 | 0,744318 |
| Var3 | -0,018954 | 1,000000 | -0,324757 |
| Var1 | 0,744318 | -0,324757 | 1,000000 |

Fig. 2.5.Matrix of pairwise correlation coefficients

Let's get histogramsand scatter diagrams of the studied variables in the model (Fig. 2.6). Coefficients of pairwise correlations and scatter diagrams indicate a weak degree of linear relationship between the studied pairs of variables.

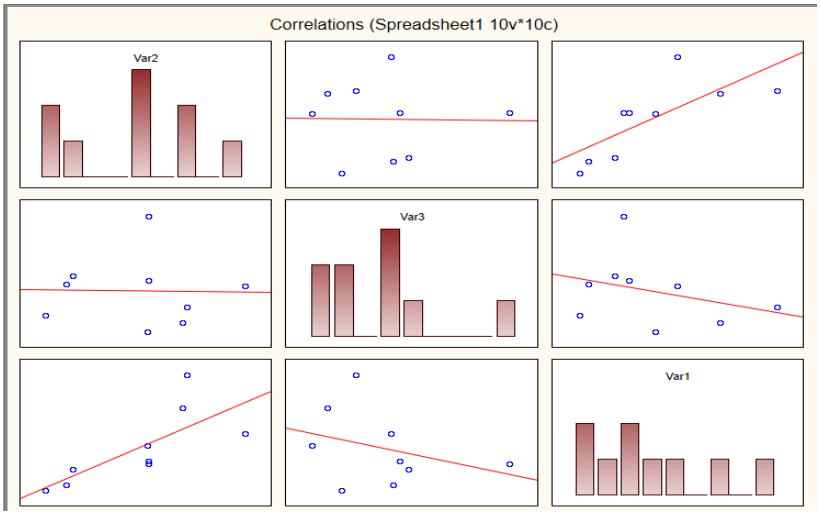


Fig. 2.6. Histograms and scatter diagrams of the studied variables

A more detailed analysis involves the calculation of partial correlations and the calculation of the maximum conjugation criterion for each of the independent ones variables.

Fig. 2.7 contains values of standardized regression coefficients (Beta in); partial correlations (Partial correlations), which reflect the degree of influence of each independent variable on the resulting one, provided that other variables do not affect this relationship; semipartial correlations (Semipartial correlations); the

coefficient of determination (R square) between this variable and the other independent variables included in the regression equation, which reflects the measure of maximum conjugation; tolerance of the model (Tolerance), which is calculated as (1 - R square); the value of the Student's test (t) for testing the hypothesis about the significance of partial correlation coefficients with the number of degrees of freedom; level of significance (p - level); the probability of rejection of the hypothesis about the significance of partial correlation coefficients.

| Variable | Variables currently in the Equation; DV: Var1 (Spreadsheet1) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **b* in** | Partial Cor. | Semipart Cor. | Tolerance | R-square | t(6) | p-value |
| **Var2** | 0,738428 | 0,780606 | 0,738295 | 0,999641 | 0,000359 | 3,05922 | 0,022247 |
| Var3 | -0,310761 | -0,465249 | -0,310705 | 0,999641 | 0,000359 | -1,28745 | 0,245366 |

Fig. 2.7.Significance of variables in the regression equation

Rating the degree of influence of independent variables on the resulting indicator is presented in Fig. 2.8.

| Variable | Redundancy of Independent Variables; DV: Var1 (Spreadsheet1) R-square column contains R-square of respective variable with all other independent variables | | | |
|---|---|---|---|---|
| | **Toleran.** | R-square | Partial Cor. | Semipart Cor. |
| **Var2** | 0,999641 | 0,000359 | 0,780606 | 0,738295 |
| Var3 | 0,999641 | 0,000359 | -0,465249 | -0,310705 |

Fig. 2.8. Estimation of excess of independent variables

Forestimation of the degree of multicollinearity according to the Ferrar-Glober algorithm uses partial correlation coefficients between factor variables and their statistical significance; for their calculation, it is necessary to study the model of the independent variable, making one of the factor variables dependent, and determine these characteristics (Fig. 2.9).

| Variable | Variables currently in the Equation; DV: Var2 (Spreadsheet1) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **b* in** | Partial Cor. | Semipart Cor. | Tolerance | R-square | t(7) | p-value |
| **Var3** | -0,018954 | -0,018954 | -0,018954 | 1,000000 | 0,00 | -0,050158 | 0,961398 |

Fig. 2.9. Estimation of the level of connection between independent variables

Thus, the value of the partial correlation coefficient is equal to: r9 = -0.019. Significance of partial correlation coefficients using Student's t-test: t = -0.0502.

ttable(0.05;13)= 2.28.

t9 <t table, then we can conclude that there is no close linear relationship between variables x1 and x2.

Forcalculation and study of model errors, it is necessary to calculate the theoretical values of the dependent variable and the model error, to present the results of the study of the model according to the Durbin–Watson criterion and the non-cyclic autocorrelation coefficient, and to draw conclusions about the presence of autocorrelation.

Let's get a table withobserved values of the dependent variable (Observed value), theoretical values of the dependent variable (Predicted value) and model errors (Residual) and a graph of the distribution of model errors in the ±3s range, which analyzes the property of constancy of error dispersion (Fig. 2.10).

| Case | Raw Residuals -3s . . . 0 . . +3s | Raw Residual (Spreadsheet1) Dependent variable: Var1 Observed Value | Predicted Value | Residual | Standard Pred. v. | Standard Residual | Std.Err. Pred.Val | Mahalanobis Distance | Deleted Residual | Cook's Distance |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | . . . * \| . . . | 2638950 | 2936319 | -297369 | -1,02997 | -0,42733 | 454948,0 | 2,530425 | -519345 | 0,079353 |
| 2 | . . . *\| . . . | 2767688 | 2893365 | -125677 | -1,08220 | -0,18060 | 359143,3 | 1,241952 | -171305 | 0,005380 |
| 3 | . . . \| * . . . | 3204396 | 2882762 | 321634 | -1,09510 | 0,46219 | 355533,2 | 1,199329 | 435245 | 0,034037 |
| 4 | . . . \|* . . . | 3342741 | 3221296 | 121445 | -0,68339 | 0,17452 | 584086,0 | 4,747087 | 410976 | 0,081906 |
| 5 | . . . * \| . . . | 3416404 | 3813327 | -396923 | 0,03661 | -0,57039 | 246999,9 | 0,118992 | -454137 | 0,017885 |
| 6 | . . . * \| . . . | 3849209 | 4262537 | -413328 | 0,58291 | -0,59396 | 373348,8 | 1,413852 | -580388 | 0,066741 |
| 7 | . . * \| . . . | 4188798 | 4969842 | -781044 | 1,44310 | -1,12238 | 467164,9 | 2,716532 | -1421832 | 0,627143 |
| 8 | . . . \| * . . . | 4864679 | 4584154 | 280526 | 0,97405 | 0,40312 | 363011,6 | 1,288102 | 385403 | 0,027823 |
| 9 | . . . \| . *. . | 5776168 | 4485432 | 1290737 | 0,85399 | 1,85481 | 314365,3 | 0,743730 | 1621686 | 0,369430 |
| Minimum | . . * \| . . . | 2638950 | 2882762 | -781044 | -1,09510 | -1,12238 | 246999,9 | 0,118992 | -1421832 | 0,005380 |
| Maximum | . . . \| . *. . | 5776168 | 4969842 | 1290737 | 1,44310 | 1,85481 | 584086,0 | 4,747087 | 1621686 | 0,627143 |
| Mean | . . . * . . . | 3783226 | 3783226 | 0 | 0,00000 | 0,00000 | 390955,7 | 1,777778 | -32633 | 0,145522 |
| Median | . . . *\| . . . | 3416404 | 3813327 | -125677 | 0,03661 | -0,18060 | 363011,6 | 1,288102 | -171305 | 0,066741 |

Fig. 2.10. Error analysis models and their distribution schedule

We obtain the value of the autocorrelation of model errors according to the Durbin–Watson criterion and the value of the non-cyclic autocorrelation coefficient (Fig. 2.11).

| | Durbin-Watson d (Spreadsheet1) and serial correlation of residuals | |
|---|---|---|
| | **Durbin-Watson d** | Serial Corr. |
| **Estimate** | 0,971005 | 0,498313 |

Fig. 2.11. Autocorrelation of model errors

This value of the Durbin-Watson criterion is approximately equal to 1, so we can conclude about positive autocorrelation of model errors. This criterion is within the limits $0 < d \leq d_L$

For further comprehensive analysis of errors, it is necessary to construct a histogram and a graph of the distribution of errors on normal probability paper (Fig. 2.12, Fig. 2.13).

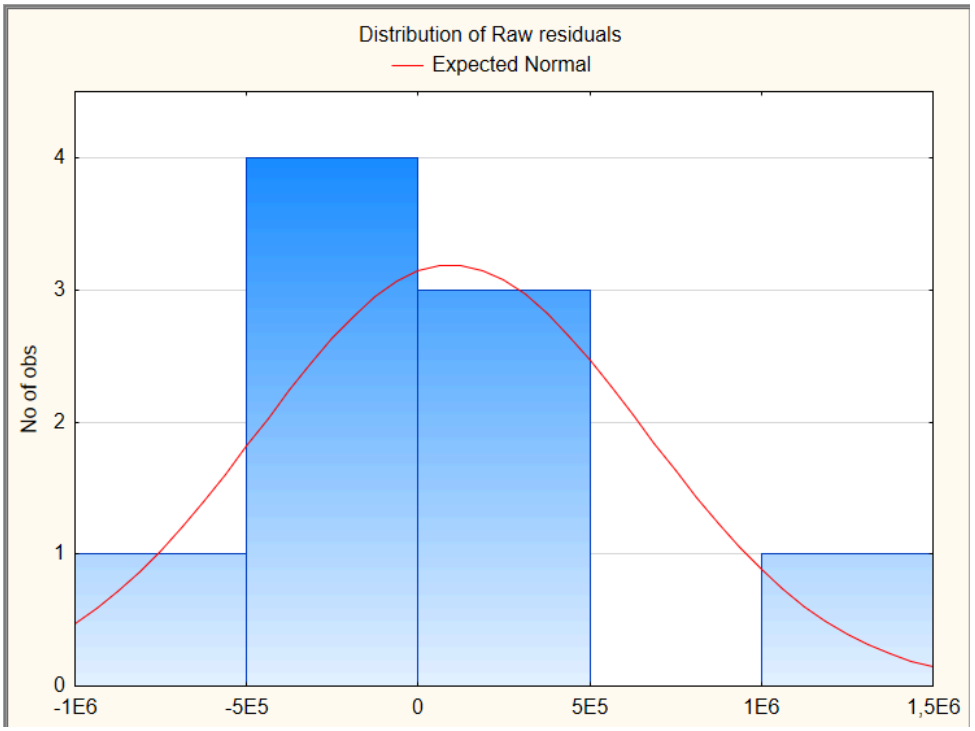


Fig. 2.12. Error distribution histogram

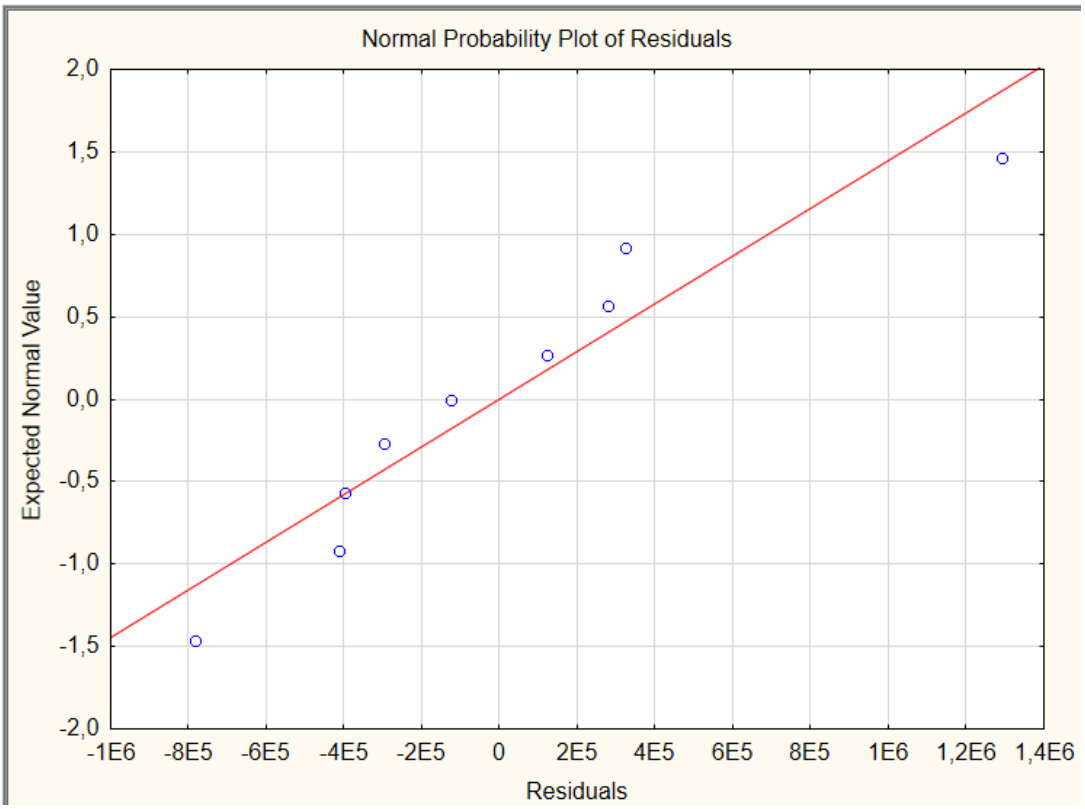


Fig. 2.13. Graph of the distribution of errors on the normal probability paper

Analyzing the graph, it can be concluded that the errors are distributed according to the normal distribution law (histogram of the distribution of errors), but do not lie well on a straight line (the graph of the distribution of errors on normal probability paper), that is, this indicates the inadequacy of the built model.

In conditions of multicollinearity of independent variables, an effective method of estimating the parameters of econometric models is the implementation of stepwise regression, which involves estimating the parameters of the model through correlation coefficients.

The sequence of stages of implementation of the forward stepwise algorithm is presented in figures 2.14-2.16.

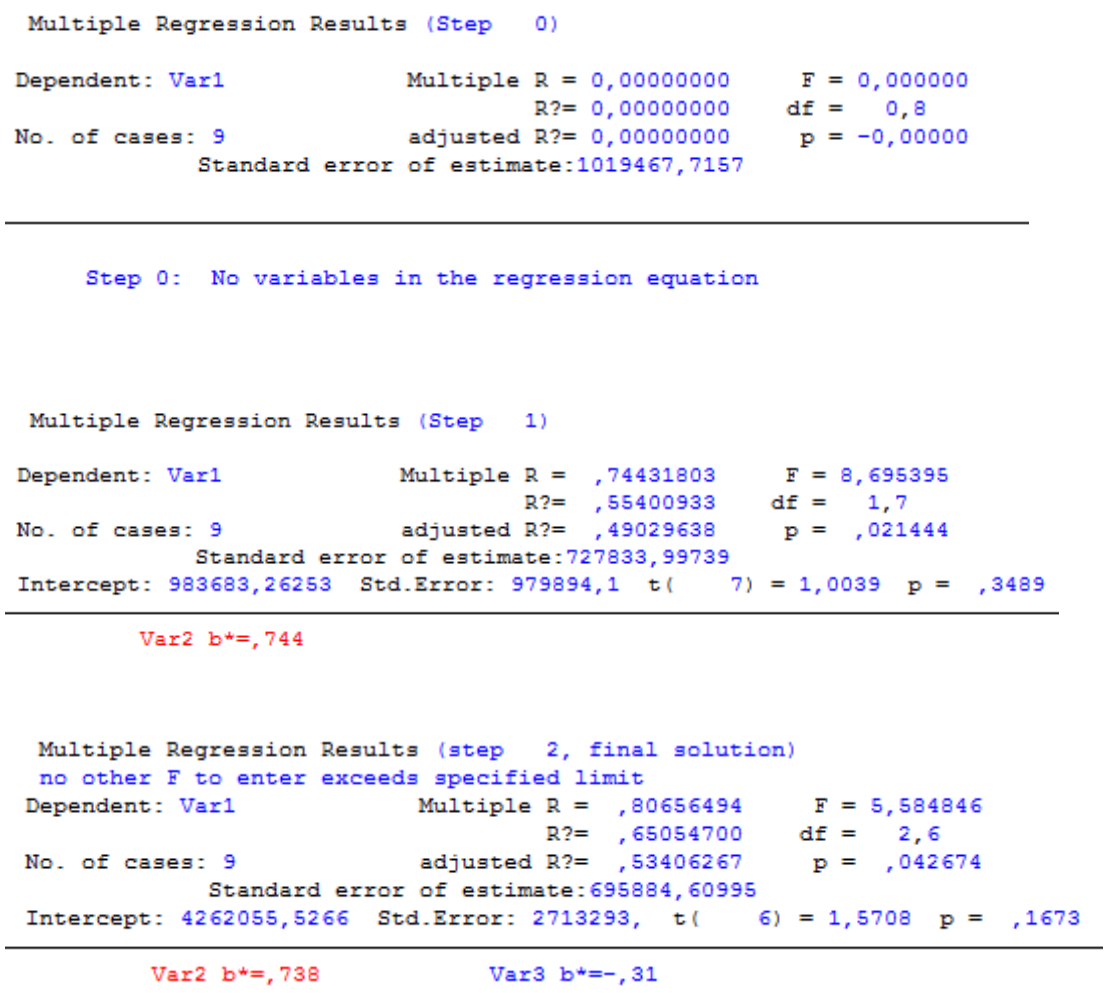


Fig. 2.14-2.16. Implementation of the model of step-by-step inclusion of variables

At step 0, there is no variable in the model yet. In step 1, the first coefficient and the first variable selected for the regression equation (X1) appeared. And so on until the procedure for selecting variables for the regression model ends (2 steps). We see that all variables from X1 to X2 are present. X1 and X2 are highlighted in red, which tells us about their importance in this model.

Let's get the table of stepwise regression results shown in Figure 2.17, which shows the adequacy of the model at each of the stages and the change in the characteristics of the model for each step.

| Variable | Summary of Stepwise Regression; DV: Var1 (Spreadsheet1) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Step +in/-out | Multiple R | Multiple R-square | R-square change | F - to entr/rem | p-value | Variables included |
| Var2 | 1 | 0,744318 | 0,554009 | 0,554009 | 8,695396 | 0,021444 | 1 |
| Var3 | 2 | 0,806565 | 0,650547 | 0,096538 | 1,657522 | 0,245366 | 2 |

Fig. 2.17. Results of the stepwise regression of inclusion

We will obtain an analysis of the results of the regression model by the method of step-by-step inclusion of model variables (adequacy, statistical significance):

| N=9 | Regression Summary for Dependent Variable: Var1 (Spreadsheet1)<br>R= ,80656494 R?= ,65054700 Adjusted R?= ,53406267<br>F(2,6)=5,5848 p<,04267 Std.Error of estimate: 6959E2 | | | | | |
|---|---|---|---|---|---|---|
| | b* | Std.Err. of b* | b | Std.Err. of b | t(6) | p-value |
| Intercept | | | 4262056 | 2713293 | 1,57081 | 0,167283 |
| Var2 | 0,738428 | 0,241378 | 0 | 0 | 3,05922 | 0,022247 |
| Var3 | -0,310761 | 0,241378 | -0 | 0 | -1,28745 | 0,245366 |

Fig. 2.18.Regression model by stepwise inclusion method

Based on the obtained data, it can be concluded that in this model variable X1 is significant, and variable X2 is insignificant.

Consider the sequence of stages of implementation of the backward stepwise algorithm.

```
 Multiple Regression Results (Step   0)

Dependent: Var1              Multiple R =  ,80656494     F = 5,584846
                                     R?=  ,65054700    df =   2,6
No. of cases: 9              adjusted R?=  ,53406267     p =  ,042674
            Standard error of estimate:695884,60995
Intercept: 4262055,5266  Std.Error: 2713293,   t(    6) = 1,5708  p =  ,1673
```

Var2 b*=,738 Var3 b*=-,31

```
  Multiple Regression Results (Step   1)

Dependent: Var1              Multiple R =  ,74431803     F = 8,695395
                                     R?=  ,55400933    df =   1,7
No. of cases: 9              adjusted R?=  ,49029638     p =  ,021444
            Standard error of estimate:727833,99739
Intercept: 983683,26253  Std.Error: 979894,1  t(    7) = 1,0039  p =  ,3489
```

Var2 b*=,744

Fig. 2.18. Implementation of the model of step-by-step exclusion of variables

Regressivethe model by stepwise exclusion of variables is presented in Figure 2.19:

| N=9 | Regression Summary for Dependent Variable: Var1 (Spreadsheet1)<br>R= ,74431803 R?= ,55400933 Adjusted R?= ,49029638<br>F(1,7)=8,6954 p<,02144 Std.Error of estimate: 7278E2 | | | | | |
|---|---|---|---|---|---|---|
| | **b*** | Std.Err. of b* | b | Std.Err. of b | t(7) | p-value |
| **Intercept** | | | 983683,3 | 979894,0 | 1,003867 | 0,348875 |
| Var2 | 0,744318 | 0,252414 | 0,1 | 0,0 | 2,948796 | 0,021444 |

Fig. 2.19.Regression model by stepwise exclusion method

These methods allow us to prove that our initial model is inadequate.

We will find the forecast value of the amount of the mandatory reserve with the following values of the indicators: loans and advances - 45000000 thousand. hryvnias, funds of individuals - 15,000,000 thousand UAH

We will get the following forecast results:

| Variable | Predicting Values for (Spreadsheet1) variable: Var1 | | |
|---|---|---|---|
| | **b-Weight** | Value | b-Weight * Value |
| **Var2** | 0,083059 | 45000000 | 3737643 |
| Var3 | -0,238014 | 15000000 | -3570206 |
| Intercept | | | 4262056 |
| Predicted | | | 4429492 |
| -95,0%CL | | | 3295661 |
| +95,0%CL | | | 5563323 |

Fig. 2.20. Model forecast results

Predictable value of the dependent variable for the model is 4429492 and the confidence intervals for the predicted value are:

$$3295661 \leq Y \leq 5563323.$$

Thus, it can be concluded that all parameter estimates are statistically significant, that is, the corresponding independent variables are reasonably included in the model and really have a significant impact on the dependent variable, and the selected amounts are correctly defined.

It should be noted that the estimates of the model parameters simultaneously act as elasticity coefficients for the corresponding variables. since we built the model not on the basis of the absolute values of the indicators, but on the basis of their logarithms.

Summing up, it should be noted that the study proposed an approach for evaluating the financial results of domestic banks based on econometric modeling methods. It was determined that the main indicators affecting the bank's resistance to financial risks are the amount of its mandatory reserve at the NBU, the amount of loans and advances to clients, and the amount of funds of individuals. The constructed econometric allows to quantitatively analyze the impact of each indicator on risk management and can be used in the future to forecast the amounts of the mandatory reserve.

In the future, it will be appropriate to carry out a more detailed econometric analysis of banks' activities both by individual clusters (banks with a state share, commercial banks with domestic capital, banks with foreign capital) and by different time periods, which will make it possible to more thoroughly determine the trends and peculiarities of development of the banking system in order to develop recommendations for more effective functioning of it in the near future.

# CHAPTER 3
# WAYS OF IMPROVING RISK MANAGEMENT POLICY IN COMMERCIAL BANK

## 3.1. Methodology for improving the assessment and minimization of the main types of risks in JSC "MR BANK"

The importance of creating a qualitatively structured and independent risk management system in the bank in light of the complexity of banking products, as well as modern crisis phenomena in the financial sphere, does not require special justification. The lack of an effective risk management system can ultimately lead the bank to significant problems. A separate, underestimated bank risk turns into a structural risk and causes losses to the entire bank. However, it is necessary to understand that it is impossible to completely avoid risks in banking activities, and therefore the goal of the risk management process in the bank is not to completely avoid them, but to limit and minimize their impact [67, p. 26].

The decision-making mechanism of the bank's risk management should not only identify the risk, but also allow to assess what risks and to what extent the bank can take on itself, as well as whether the bank's expected profitability will justify the corresponding risk. At the same time, it should be remembered that the justified risk of the bank is a necessary component of the strategy and tactics of effective bank management.

When carrying out the process of risk management in the bank, it is necessary to take into account that all types of risks are interconnected, and the level of risk is constantly changing under the influence of a dynamic environment, which was discussed in the second chapter. As the Ukrainian market of banking services develops and a greater number of complex banking products appear, the risk of the banking system as a whole will increase. This process must necessarily be accompanied by the strengthening of the requirements of the National Bank of

Ukraine for the capital adequacy of domestic banking institutions and their liquidity to ensure the coverage of banking risks. In addition, the strengthening of requirements will also be aimed at obtaining sufficient and high-quality information about the bank's activities. The implementation of a correctly structured centralized risk management system will allow the bank to be a more reliable partner for all participants of both the domestic and foreign market of banking services, since the banking risk management system in developed countries has recently acquired the characteristics of a guarantee.

Since the most significant banking risk is credit risk, and the country is in the process of integration, it will be advisable to use foreign experience in risk assessment.

In foreign banks, methods such as "PARSER", "CAMPARI" and "CAMELS" are widely used to assess the borrower's creditworthiness. The essence of each of them is as follows: in the "PARSER" method (Person, Amount, Repayment, Security, Expediency, Remuneration) [66, p. 94] the rating is determined based on such indicators of the borrower as:

- information about the person of the potential borrower, his reputation, credit history - (P);
- justification of the amount of this loan - (A);
- repayment possibilities - (R);
- security assessments - (S);
- feasibility of the loan - (E);
- the bank's remuneration of the interest rate for the risk of granting credit - (R).

In the "CAMPARI" methodology (Character, Ability, Means, Purpose, Amount, Repayment, Insurance) to determine the rating, unlike the previous one, other indicators are used along with the specified ones:

- reputation of the borrower - (C);
- assessment of the borrower's business - (A);
- analysis of the need to apply for a loan - (M);

- the purpose of the loan - (P);
- justification of the purpose of the loan - (A);
- possibility of repayment - (R);
- method of credit risk insurance - (I).

In the "CAMELS" method (Capital, Asset, Management, Efficiency, Liquidity, Sensitivity) [54, p. 29] the main emphasis is on the analysis of the financial activity of the borrower, and therefore the indicators for determining the rating are:

- assessment of the borrower's equity - (C);
- assessment of the borrower's assets - (A);
- management quality assessment - (M);
- efficiency of the borrower's financial and economic activity, profitability - (E);
- liquidity assessment - (L);
- assessment of susceptibility to risk - (S).

Along with the mentioned methods, in US banks [55, p. 47] the so-called "rule of six Sis" received wide practical application: Character, Capacity to pay, Cash, Collateral, Conditions, Control. This rule is based on the following indicators when determining the borrower's rating:

- character of the borrower (reputation of the borrower, degree of responsibility, readiness and desire to repay the debt) - (1C);
- financial capabilities (analysis of the borrower's income and expenses, as well as a forecast of prospects for their change in the future) - (2C);
- cash (availability of the borrower's sources of funds to repay the debt) - (ZS); • securing the loan - (4C);
- general economic conditions (business climate in the country and its impact on the financial condition of both the bank and the borrower) - (5C);
- control (analysis of the borrower's reporting, information from third parties, from the mass media, etc.) - (6C)

In addition to the "rule of six" to assess the borrower's creditworthiness,

many US banks also use such groups of indicators of his financial condition [66] as: liquidity of assets, turnover of capital, attraction of funds, profitability.

To achieve success in limiting risks, banks must create and develop consolidated risk management systems. It is with the help of such systems that the bank's management gets the opportunity to identify, evaluate, minimize and control this or that risk.

Each bank, when developing its own methodical base that regulates the issue of lending, proceeds from the goals and essence of its credit policy. Therefore, the improvement of the methodological base considered by us should be directly aimed at accounting for significant external factors that affect the banking business and receive a corresponding reflection in the bank's credit policy. At present, the main one of them should be considered the strengthening of competition in the banking business. And the main tools that ensure success in it are:

- reduction of requirements for the borrower (as a rule, in the matter of securing the loan) depending on the type of loan;
- expanding the range of loans taking into account the individual needs of client groups;
- increasing the price attractiveness of credit services.

Therefore, ways of improving the methodical base must be considered within the framework of the bank's application of the specified tools.

Loan security is one of the most important factors taken into account by the bank when considering a loan product. The results of the loan collateral assessment are used in the determination of credit risks (in the borrower rating method).

As security for credit products provided by the bank, the pledge of movable and immovable property belonging to the borrower and third parties with ownership rights is usually considered, in the absence of prohibitions or restrictions on the use of property as collateral established by law or by the bank itself. The assessment of the quality of collateral is carried out on the basis of determining the rating for each of the following categories of collateral:

- real estate;

- machines and equipment;
- commodity values (goods in circulation).

Rating, as we mentioned earlier, involves the identification of factors (indicators) that influence the quality of collateral, and the selection of a rating scale for each of these indicators.

Taking into account the above, the improvement of credit risk assessment methods will consist in clarifying the list of indicators, as well as its numerical point values, in relation to each category of collateral, which together determine the quality of credit security.

So, we will present and justify the borrower rating methodology, which is the most adequate. This technique allows calculating and assigning the rating of the borrower, security and credit based on the analysis of accounting and management reporting and financial ratios. Based on the results of such an analysis, the bank assigns a credit transaction (credit product) rating, which is a consolidated assessment consisting of:

- the rating of the borrower determined by the use of indicators characterizing his financial condition;
- security rating, which characterizes the quality of the loan security offered by the borrower.

Analysis of the borrower's financial condition in order to determine his creditworthiness is carried out taking into account the following factors that determine one or another aspect of credit risk:

- market positions;
- business reputation, credit history, openness and reliability of information;
- analysis of the financial situation;
- business activity and turnover of funds;
- profitability.

When determining the security adequacy rating, the following factors are taken into account:

- liquidity and sufficiency;
- preservation;
- the risk of the bank losing the lien.

At the same time, the evaluation of each of the specified factors is carried out on the basis of point values of the criteria introduced by the bank to characterize the most significant elements (gradations) that reflect the essence of one or another factor. To evaluate such criteria, a scale of the following points is used: 5 ("excellent"), 4 ("good"), 3 ("satisfactory"), 2 ("unsatisfactory"), 1 ("bad"), 0 ("very bad ») [80].

The proposed criterion for assessing the provision factor existed in the banking practice of credit risk assessment from the point of view of provision. The most common problem that arises when securing loans is the impossibility of implementing it at the collateral value that was originally calculated during the preparation of contracts, which leads to losses.

The process of risk management is inherently continuous, its stages (stages) alternate with each other. The bank's risk protection mechanisms consist of current risk regulation and methods of its minimization [11]. At the same time, current risk regulation should be understood as tracking critical indicators and making operational decisions on banking operations based on this.

It should be taken into account that the implementation of an external risk factor to which the bank is exposed may jeopardize the continuity of its activities. Therefore, in the process of risk analysis, the bank must take into account the possibility of extreme circumstances (stress scenario). Thus, the bank must develop appropriate emergency measures in the form of an action plan in case of crisis circumstances, which is subject to regular updating and testing. Such action plans are an integral part of the bank's risk control mechanisms [39, p. 244].

The bank must also ensure the availability of procedures and measures to prevent stressful situations caused by internal causes. The bank must monitor risks to ensure a reasonable and reliable relationship between the general parameters of

its risks and capital, financial resources and financial results (revenues) through appropriate control mechanisms.

Thus, it can be concluded that at the current stage of JSC "INTERNATIONAL RESERVE BANK" JSC, in order to implement its own strategy, it is necessary to additionally apply foreign experience in risk assessment, and not rely only on methods that are regularly used. This will give him the opportunity to move in the right direction with full compliance with external and internal realities.

## 3.2. Risk management as the main means of risk minimization

An important area of activity in the banking system in modern conditions is the management of banking risks, the quality of which depends on the stability and effectiveness of banks' work. Risks are measured by indicators that predict an event and its impact on the results of banking activity.

The banking system in its activity is characterized by high risk compared to other types of activity. The activities of banks are diverse: attracting funds, issuing and purchasing securities, issuing loans, factoring, leasing, providing clients with funds, and others. The execution of any banking transaction is associated with the possibility of realizing several risks and the corresponding impact on the results of operations. Quantitatively, these impacts can be estimated with a certain probability [55, p. 35].

The activity of operational units and the mandatory use of high-tech systems is accompanied by a number of functional risks. Strict regulation of banks by the state, the National Bank of Ukraine, also creates new risks, which entails risks in the financial system of the state, since these systems are closely interconnected. There are external and internal risks in banks. External risks do not directly depend on the bank's activities. These are, in particular, political, legal, social and general economic risks arising in cases of worsening economic crisis, introduction of

embargoes, cancellation of import licenses, natural disasters, privatization, nationalization, inadequate legal regulation, etc. Their influence on the bank's activities is great, and management is difficult and often even impossible. Internal risks depend on the activity of the bank, the number of clients, partners, banking operations, connections, services, etc.

In the conditions of the spread and development of negative processes in the political life of Ukraine, in economic activity and other spheres of public life, their impact on the financial and banking system, and with the aim of reducing the negative consequences of risks on the results of bank operations and the financial system of the state, the urgency of improving management in banks. Risk management, which is currently being successfully implemented in a number of banks and has become an important element of their successful functioning, is a tool that enables making well-founded decisions.

Banking risk management is an activity aimed at assessing the risks arising in the activities of banks. By making appropriate recommendations and making management decisions, it ensures a reduction (reduction) of the negative consequences of the realization of risks.

Banking risk management can be considered from different positions: as a branch of scientific knowledge, as an economic phenomenon, as a management system, as a management process, as the art of management and as a management body (Fig. 3.1).

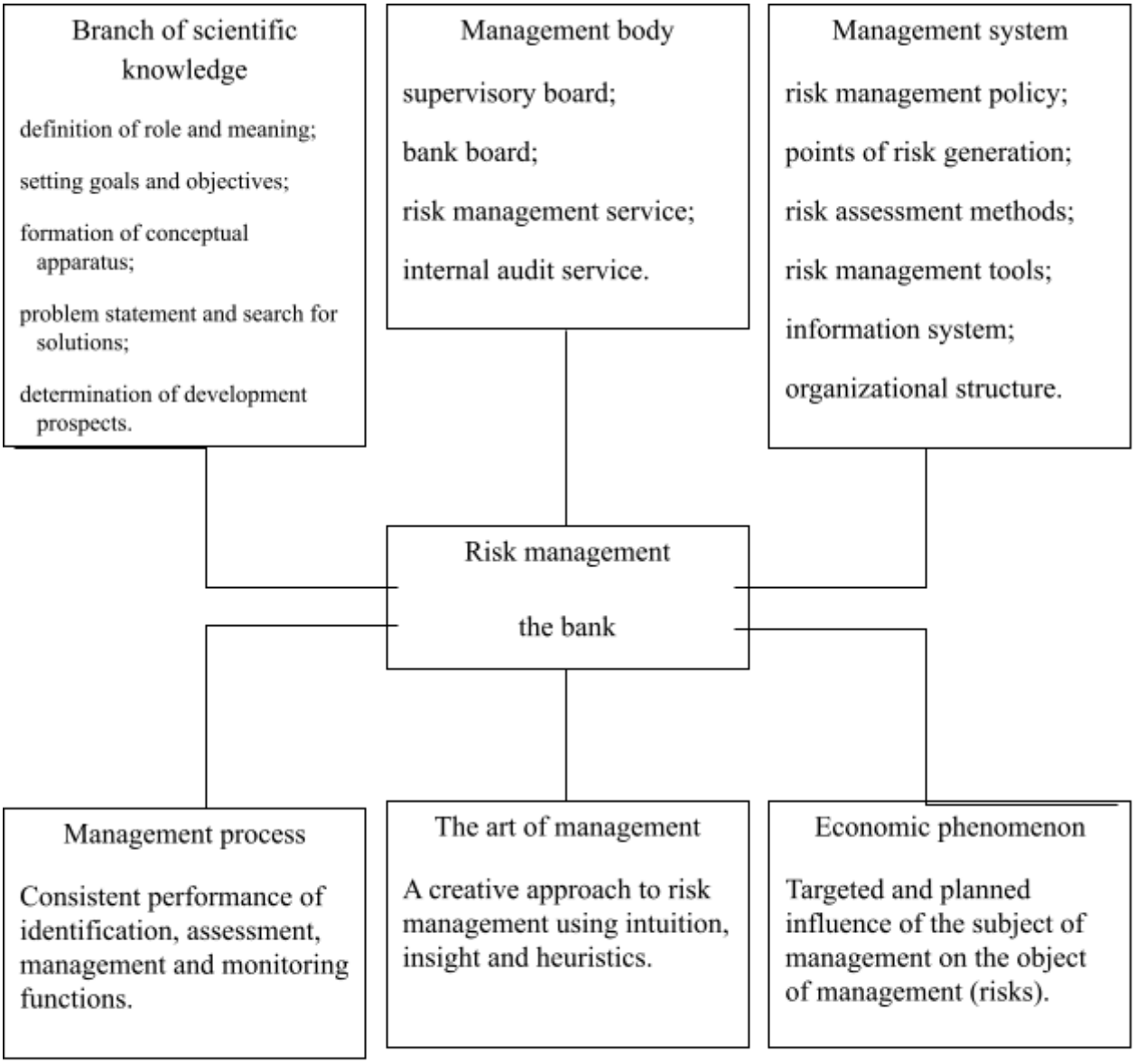


Fig. 3.1. Constituent concepts of "bank risk management"

Risk management should become an independent form of banking activity, the purpose of which is to reduce the impact of risks on the results of banking activity. It can be an integral part of market relations. In this case, the state should promote the development, development and implementation of risk management methods through various influence mechanisms.

Strengthening the regulation of banking activity and the development of risk management are connected with the increase in requirements for the quality of risk

assessment of both the National Bank of Ukraine and the management of banks. The number of risks that need to be taken into account when making management decisions and the cost of making unfounded management decisions have also increased. In addition, the negative effects on banking activity of decisions that do not take into account existing risks have increased, and there has been a need to create a risk management system in each bank to maintain the stability of banks and their stable operations.

Currently, there is a requirement that all decisions made in the bank's activities take risks into account. In the modern political and economic conditions of Ukraine, the success of banking activity and the functioning of the state's financial system in general requires the development and implementation of risk management, which can and should become an important tool for ensuring the stability and efficiency of banks.

At the same time, in the banking system of Ukraine, despite the complications of the socio-economic situation in the country, there is no holistic approach to risk management in the activity of banks. There is no strategy and concept of bank risk management, which would determine the goals, methods of risk management, provide solutions to theoretical and implementation problems of risk management. In addition, many bank managers are aware that in the absence of effective methods of risk assessment, effective results of improving banks' activities cannot be achieved. In such conditions, ineffective activities regarding the implementation and effectiveness of risk management will only lead to increased costs. Therefore, it is not by chance that when solving questions about the creation of structural divisions that will deal with risk management, the question arises about the correspondence of the costs of risk assessment and the obtained results [71, p. 29].

Despite this, risk management in the banking system of Ukraine can and should develop. The situation will accelerate with the consolidation of banks, increase in their capitalization, etc. Taking this into account, we can conclude that risk management is an extremely important area of financial management in banks.

Evaluating the situation in the banking sector, the presence of factors in it that generate a significant number of risks in banking activity, the need to ensure stability in the functioning of the banking system of the state, and through it - stability in the financial system, it is possible to draw a general conclusion about the need to develop and implement in the activity of banks risk management. This is an important means of ensuring the stability of the banking system in general, specific banks, the financial system and the economic development of Ukraine.

According to experts, banking risk management should be based on the following principles:

- conscious management decision-making in order to obtain the planned profit and other results;
- implementation of management of identified and taken into account risks;
- ensuring the negative impact of risks;
- independence of individual risk management;
- comparison of the level of considered risks with the level of profitability of banking operations;
- taking into account the time factor in risk management;
- taking into account the bank's general strategy in the risk management process;
- taking into account the possibility of transferring part of the risks to the bank's counterparties.

When managing risks, it is necessary to constantly take into account the economic component of such activities. For this, experts recommend using methods of avoiding risks, minimizing risks (preventing them from exceeding the established level); hedging, diversification of risks by dividing assets and liabilities according to different components; distribution of risks through the transfer of part of them to partners, self-insurance [20].

In order to introduce risk management and ensure its effective operation, managers of relevant state authorities and banks should take a number of measures:

- ensure the improvement of the legislative and regulatory framework for more effective protection of the bank's creditors and depositors;
- to improve banking regulation and supervision systems;
- ensure constant monitoring and assessment of risks;
- prevent uncontrolled and unregulated decisions related to banking risks;
- to improve the methods of formation of reserves by banks to cover risks for active operations;
- ensure the creation of an effective system of information storage, exchange and use;
- to introduce additional regulatory differential rates from banks to the Individual Deposit Guarantee Fund;
- introduce a regular assessment of financial stability in order to ensure a timely response in accordance with the data of the monitoring system;
- ensure the reduction of risks arising in the financial system by strengthening the protection of consumer rights in financial services markets and ensuring the transparency of the activities of financial market participants, which will contribute to an increase in the volume of investments;
- implement a new system of macroprudential supervision of financial institutions in order to prevent systemic risks in the financial market;
- to increase the efficiency and effectiveness of the management of institutions belonging to the sphere of management of the Ministry of Finance of Ukraine;
- ensure the implementation of the best global methods and practices, taking into account domestic features, which will ensure more effective decision-making.

The application of risk management in the banking sector as a means of ensuring the stability of the state's financial system has significant advantages. In particular, this will contribute to the introduction of a new system of mortgage lending to the population of Ukraine using new financial instruments (mortgage

derivatives), and will also ensure openness and equal access to the refinancing system of all Ukrainian banks. In addition, it makes it possible to cancel the copying of identity documents when performing currency exchange transactions. Identification of customers does not lead to a decrease in the volume of foreign currency sales, but only leads to an increase in the shadow currency market and unauthorized use of copies of documents. It will also be possible to harmonize and improve legislation in the field of currency control; declaration of currency values of residents located outside Ukraine; loans received from non-residents.

Risk management in the banking sector will also contribute to the improvement of the regulatory framework of currency control regarding currency exchange audits of head offices, off-balance sheet and other separate divisions of banks; will make it possible to develop mechanisms that will prevent the conflict of interests of employees and officials during the implementation of control, inspections and supervision of the activities of Ukrainian banks. This will help strengthen lending to small, small, private enterprises by banks of Ukraine, ensure constant monitoring and assessment of risks, prevent the adoption of uncontrolled and unregulated decisions related to banking risks, and generally take measures to reduce the operational risks of the banking system of Ukraine.

The basis for ensuring the stability of the state's financial system should also be a high rate of accumulation and capitalization of the financial sector, low regulatory costs, a fiscal burden balanced with the needs of economic development that does not hold back the investment process, low inflation rates and a predictable exchange rate, a balance of monetary demand for internal and external resources, working capital redistribution mechanisms between sectors of the economy, an effective monitoring system for systemic risks, an effective state support system and financing of priority areas of economic activity.

It is important to understand that in conditions of financial market instability, the importance of improving risk assessment tools at the macro- and micro-level increases. One of such tools, relevant in the last decade, both for the regulator of banking institutions and for the banks themselves, is stress testing.

Stress tests were originally developed as risk assessment tools at the level of individual portfolios. Currently, they are widely used by financial organizations as a risk management tool. Gradually, the stress-testing technique began to be used in a broader context in order to measure the sensitivity to general shocks of groups of institutions (such as commercial banks) or even the entire financial system [46, p. 29].

Stress testing (English. Stress testing) is one of the types of testing that assesses the reliability and stability of the system in conditions of exceeding the limits of normal functioning. The result of stress testing is the detection of system stability under a greater load than that which allows the system to be in a stable position under normal conditions. Stress testing as a modern tool of risk management allows to estimate the maximum expected losses of individual banks and the banking sector as a whole, depending on global and specific economic trends in one or another country.

The purpose of stress testing is to assess the possible losses of the banking system in the event of certain events. As a result of the analysis, a kind of integral assessment is obtained, which allows you to determine which conditions (factors) the bank will find itself in a critical state if it changes. Thus, the scenario of the state of the bank in stress is being painted.

The need for stress testing is that already at the early stages it is possible to predict changes in the system and form preventive measures to prevent stress or (when stress occurs) to have an idea of how the system will react to it. Thus, stress testing of both individual banks and the banking system as a whole allows us to find out what losses the bank (or the system as a whole) may incur in the event of unexpected events.

The methodology of stress testing should be modified [46, p. 30]. The shortcomings of the approach can be eliminated if self-testing of banks is used in parallel. Banks must organize stress testing of their financial position. They should check themselves for credit risk, liquidity risk and market risks (currency, interest rate, base and stock risk). Testing allows taking into account the risk profile of each

bank. In practice, with the exception of a number of the largest market participants, the vast majority of banks have never conducted stress testing and are unable to conduct it for personnel, financial and technical reasons. In this regard, the regulator is at the initial stage of implementation.

Based on the recommendations of the IMF and the World Bank, it is important to standardize the methodology of conducting stress tests for domestic banks and to automate the procedures for obtaining the necessary data. Their advisory nature introduces uncertainty into the behavior of banking institutions and deprives them of the opportunity to apply this attractive tool of activity modeling in the market environment. In this regard, it is appropriate to: develop an econometric model that describes the interrelationships and influence of macroeconomic parameters and allows assessing the consequences of stressful events for the banking sector; to clearly define the time horizon of modeling stress situations and the propensity of individual banks to risk; to improve obtaining estimates of the possibility of default of borrowers at the macro level; predict shock scenarios, etc.

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

In order to ensure the real sector of the economy, the financial system should contribute to increasing the competitiveness of economic entities on the basis of financial stimulation and ensuring innovation, increasing the level of saturation of the economy with financial assets and services, attracting foreign direct investments and maintaining a stable value of the national monetary unit.

Today, there are different points of view regarding the need for practical application of stress testing methods by domestic banks. According to some representatives of the banking community, the introduction of the above-mentioned anti-crisis tools is a necessary procedure, therefore, in conditions of instability, it allows to determine non-standard combinations of factors affecting business and to identify the dependence between them.

On the other hand, we cannot ignore the point of view that states that stress testing is a rather expensive procedure, the implementation of which is beyond the reach of most small and medium-sized banks (a large database, the latest computer equipment, software tools, specially trained personnel are necessary).

However, the current state of the banking system forces the use of such anti-crisis management tools as stress testing.

Thus, we can conclude that the development of the mechanism for ensuring financial stability in the banking system of Ukraine, the introduction of risk management in the activities of banks will strengthen the stability of the state's financial system and stimulate the restructuring of the real sector of the economy, stabilize the pace of development of the domestic economic system.

## 3.3. Recommendations for the introduction of innovations in management policy of banking risks

Currently, the main reason for the growth of banking risks is the crisis in the economy, at the same time, it is a consequence, on the one hand, of the insufficient implementation of innovations in risk management, in particular the use of imperfect scoring models, and on the other hand, the insufficient implementation of innovative services that would allow obtaining additional income and improve performance indicators of banks.

The effectiveness of innovations related to institutional changes is determined by increasing the ability of banks to implement innovations - new products/services, business processes. The effectiveness of the implementation of innovations in risk management involves obtaining economic, social, strategic effects, taking into account the success of solving the "profit-liquidity-risk" problem, improving the bank's activities as a whole. The effectiveness of innovations related to regulation and management implies the growth of opportunities to accumulate capital for its further reinvestment in innovative activities, the ability to introduce new innovations. The effectiveness of market innovations is determined by the level of meeting the needs of customers with innovative services, increasing the bank's competitiveness, achieving competitive advantages, expanding the scope of business and improving the market position of banks.

Today, many scientists and practitioners believe that the innovative activity of banks is insufficiently effective, which is due to the negative influence of a number of factors. In particular, N. Panteleeva [56, p. 187] distinguishes economic, internal, other. Such a classification is not entirely clear, since external and other factors can also be of an economic nature. It is proposed to classify the factors that negatively affect the effectiveness of innovative activity of banks into: intra-bank factors; macroeconomic/institutional/external environment; of a global nature/external world.

The global factors of the outside world include the lack of interest of foreign investors due to the low attractiveness of the banking sector of Ukraine and instability in the state; internal problems in foreign parent companies; low international ratings of Ukrainian banks, etc. Macroeconomic factors include political and macroeconomic instability, underdevelopment of the stock market, lack of tax incentives, etc. Speaking of internal bank factors, it should be noted that the effectiveness of innovative activity largely depends on the bank's intellectual capital.

Today, the period of active development on a new innovative basis has come for banks. Many banks spend a significant portion of their investment on online, self-service and mobile banking. The consequence of such a policy for banks was an increase in administrative and operational costs. In the near future, to ensure competitiveness, banks need technological innovations not just aimed at increasing the efficiency of operational activities, but multifunctional technologies capable of ensuring a high level of adaptation to new customer needs and improving performance indicators.

The Basel Committee emphasizes the need to use an integrated approach to risk management [2, p. 45], the control of which should be an integral part of the bank's overall risk management system and take into account the specifics of innovative products and services, the general risk profile, the operational structure and corporate culture of innovation management, that is, the approaches to building risk management systems should be changed, taking into account the specifics of innovation activities (Table 3.1).

Table 3.1

Comparative characteristics of risk management systems in electronic banking

| Traditional electronic banking risk management system | Risk management system taking into account the requirements of the Basel Committee |
|---|---|
| The bank's management is aware of the importance of credit (formation of reserves), liquidity, currency and interest risks (impact on income (P&L), capital) | The bank's management is aware of the need for an integrated approach to managing risks associated with the introduction of electronic banking technologies and their impact on the risk profile |
| Only auditors and risk managers are interested in the risks associated with the implementation of electronic banking technologies | Every employee involved in the process is interested in controlling business risks |
| Each unit performs exclusively its tasks. The task of the front office is to attract as many customers as possible, and control should be performed by the back office | Assessment and control of business risks should be focused, coordinated and involve control by senior management |

| | |
|---|---|
| Lack of a risk control policy related to the introduction of electronic banking technologies | Implementation of an integrated risk management and control system |
| It is necessary to check activities and identify business risks, and then react to them, that is, as such, there is no preventive control | It is necessary to predict and anticipate business risks, constantly monitor possible new sources of risk |
| Irresponsibility and insufficient professional level of employees are the main cause of risks | Inefficiently constructed processes are the main source of risk |

Note that today the main innovations in banking are related to remote banking technologies. The Basel Committee on Banking Supervision defined the principles of risk management in the provision of banking services in electronic format [11], which include: principles for the board of directors and the board of the bank; principles for the selection and adequate functioning of security means; principles for increasing the importance of risk management. The Basel principles are the basis for the construction by banks of complex electronic banking risk management systems, without which all further work on the identification, analysis, assessment and minimization of risks loses its meaning. Note that in Ukraine, regulatory standards lag behind changes related to the introduction of remote customer service technologies and a risk-oriented approach.

The main risks associated with the implementation of electronic banking systems include operational, legal, strategic, reputational and liquidity risks [58]. Scientists and practitioners believe that when implementing electronic banking technologies, the main operational risk is the cause of 60% of business process interruptions, which are classified in the following ratio: technological failures - 20%, process errors - 40%, personnel errors - 40% [58]. In connection with this, it is believed that in the conditions of internetization and globalization, the activity of a modern high-tech bank should be based on the principle "Know your technologies".

The effectiveness of innovative activity of banks depends on the management of the risks that arise, and above all, the operational risk, which,

according to the requirements of Basel II, includes strategic, legal, and reputational risks and must be taken into account when calculating the regulatory capital adequacy standard. The difficulty lies in the fact that in Ukraine, the current legislation and regulatory legal acts of the NBU do not establish requirements for the quantitative assessment of operational risk, including and operational risk arising from the implementation of innovative systems, and taking it into account when calculating the regulatory capital adequacy standard (H2), which makes Ukrainian banks vulnerable to operational risks.

The need to improve the efficiency of operational risk management in Ukrainian banks is due to the fact that operational risk has recently grown and materialized in significant losses, including as a result of the introduction of increasingly complex innovative remote banking systems, internationalization of banking activities, management of banking operations in conditions of uncertainty. Scientists and practitioners believe that 15-20% of the total operational risk is related to innovative activities of banks.

At the same time, if you apply the means of identifying risks indicated in point 3.1 of the study, in combination with those already in place, this will allow innovations to be introduced in JSC "INTERNATIONAL RESERVE BANK" without the possibility of incurring significant financial losses, and thus move to a fundamentally new level its functioning, providing services to clients, which in turn will bring it closer to the implementation of plans, according to the bank's strategy.

# CONCLUSIONS

The problem of bank risk and income is one of the key concepts in bank activity. Its essence lies in the possibility of deviating the obtained result from the planned one. The consequences of incorrect risk assessments or the lack of an opportunity to oppose effective measures can be very unpleasant.

Risk is an integral part of any economic processes. This is due to the fact that, in general, risk can be both a sign of an uncertain situation in the environment and the need to choose a certain direction in order to achieve the set goals of some economic agent.

One of the main directions for the stabilization and progressive development of the country's financial system is the proper organization of the banking system of Ukraine. Banks, accumulating significant credit resources, act as financial intermediaries in all sectors of the economy, providing financial services to enterprises, thereby ensuring the uninterrupted circulation of money and capital.

The specifics of banking risks are determined only by banking functions (primarily transformational) and distinguish the bank from other economic entities. And ensuring an effective policy of managing such risks is a primary task on the way to the successful operation of the bank and is a set of measures and methods of their implementation regarding: risk awareness, determination of the causes of its occurrence and risk areas; measurement, analysis and assessment of risk; reducing or limiting risks using appropriate management methods; implementation of constant control over the level of risks with a feedback mechanism.

The analysis of the legislative framework of Ukraine on the issues of risk management in banking showed that the management of such risks is legislated sufficiently and the influence of the state on the activity of banks has a regulatory nature. When assessing risks using a risk assessment system, supervisors determine the level of concern (ie aggregate risk) and direction of risk for each risk category. The respective conclusions of the supervisory bodies determine which supervisory

measures will be used, for example, scheduled inspection, unscheduled inspection, on-site inspection measures, etc. And the application of risk management methods and criteria enables the supervisory authorities to determine which program of supervisory actions should be developed for the bank.

Having analyzed the financial condition of JSC "INTERNATIONAL RESERVE BANK", we can say that it is stable in this bank.

The work also analyzed the indicators of the H4-H10 norms of credit risk, liquidity risk and the level of currency risk established by the NBU according to the Bank's VaR methodology in order to understand the effectiveness of its financial risk management policy.

With the help of an economic-mathematical model, the optimal level of mandatory reserve amounts in the NBU was identified and it was determined that the Bank's reserve is currently within the norm.

Although JSC "MR BANK" successfully fights risks in the process of carrying out its activities, ways of improvement and minimization of the main types of risks were determined based on the positive experience of developed countries. Special attention was paid to such methods of assessing the borrower's creditworthiness as "PARSER", "CAMPARI" and "CAMELS". It is this additional foreign experience that will enable the bank to move faster in the direction of implementing its own strategy in full compliance with external and internal realities.

For the development of the risk manager of Ukrainian banks, the necessity of using the stress testing method was substantiated. The development of the mechanism for ensuring financial stability in the banking system of Ukraine, the introduction of stress testing in the activities of banks will strengthen the stability of the state's financial system and stimulate the restructuring of the real sector of the economy, stabilize the pace of development of the domestic economic system.

For the possibility of increasing the efficiency of the level of innovative activity of banks, a more advanced classification of factors determining its negative impact was proposed. Such a classification will allow finding effective

ways to avoid these factors, which in turn will make it possible to work more efficiently.

Summarizing the above, it should be emphasized that compliance with the proposed ways of improving the banking risk management policy can improve not only the financial condition and increase the ratings of the Bank, ensuring a higher level of its activity and financial stability in difficult operating conditions in conditions of dynamism and uncertainty of the market environment, but also bring positive changes to the banking system of Ukraine as a whole.

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Онлайн сервіс створення та перевірки кваліфікованого та удосконаленого електронного підпису

ПРОТОКОЛ
створення та перевірки кваліфікованого та удосконаленого електронного підпису

Дата та час: 11:00:21 16.05.2025

Назва файлу з підписом: КМР_Хуан_Рунлі.pdf_(1).p7s[1].p7s[1].p7s
Розмір файлу з підписом: 1.1 МБ

Назва файлу без підпису: КМР_Хуан_Рунлі.pdf_(1).p7s[1].p7s[1]
Розмір файлу без підпису: 1.0 МБ

Результат перевірки підпису: Підпис створено та перевірено успішно. Цілісність даних підтверджено

Підписувач - 1: ГНИП НАТАЛІЯ ОЛЕКСІЇВНА
П.І.Б.: ГНИП НАТАЛІЯ ОЛЕКСІЇВНА
Країна: Україна
РНОКПП: 3044220121
Організація (установа): ФІЗИЧНА ОСОБА
Час підпису (підтверджено кваліфікованою позначкою часу для підпису від Надавача): 12:58:15 06.12.2024
Сертифікат виданий: КНЕДП АЦСК АТ КБ "ПРИВАТБАНК"
Серійний номер: 5E984D526F82F38F04000000B5DB6D012B553305
Тип носія особистого ключа: Незахищений
Алгоритм підпису: ДСТУ 4145
Тип підпису: Удосконалений
Тип контейнера: Підпис та дані в одному файлі (CAdES enveloped)
Формат підпису: З повними даними ЦСК для перевірки (CAdES-X Long)
Сертифікат: Кваліфікований

Підписувач - 2: АЗАРЕНКОВА ГАЛИНА МИХАЙЛІВНА
П.І.Б.: АЗАРЕНКОВА ГАЛИНА МИХАЙЛІВНА
Країна: Україна
РНОКПП: 2571514226
Організація (установа): ФІЗИЧНА ОСОБА
Час підпису (підтверджено кваліфікованою позначкою часу для підпису від Надавача): 18:25:53 10.12.2024
Сертифікат виданий: КНЕДП АЦСК АТ КБ "ПРИВАТБАНК"
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Тип носія особистого ключа: Незахищений
Алгоритм підпису: ДСТУ 4145
Тип підпису: Удосконалений
Тип контейнера: Підпис та дані в одному файлі (CAdES enveloped)
Формат підпису: З повними даними ЦСК для перевірки (CAdES-X Long)
Сертифікат: Кваліфікований

Підписувач - 3: Омеляненко Денис Олегович
П.І.Б.: Омеляненко Денис Олегович
Країна: Україна
РНОКПП: 3634714115
Час підпису (підтверджено кваліфікованою позначкою часу для підпису від Надавача): 13:22:46 03.01.2025
Сертифікат виданий: "Дія". Кваліфікований надавач електронних довірчих послуг
Серійний номер: 382367105294AF9704000000EF5A070007064B03
Тип носія особистого ключа: ЗНКІ криптомодуль ІІТ Гряда-301
Серійний номер носія особистого ключа: Не визначено
Алгоритм підпису: ДСТУ 4145
Тип підпису: Кваліфікований
Тип контейнера: Підпис та дані в одному файлі (CAdES enveloped)
Формат підпису: З повними даними ЦСК для перевірки (CAdES-X Long)
Сертифікат: Кваліфікований

Версія від: 2025.01.15 13:00