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COMPREHENSIVE CREDIT RISK ASSESSMENT OF UKRAINIAN BANKS

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ABSTRACT

Credit risk is an integral element of banking activities, the identification and effective management of which is essential in today's environment. The financial stability of both individual banks and the banking sector as a whole depends on the feasibility and effectiveness of risk management. The purpose of the study is to systematise the approaches approved at the state level to assessing the credit risk of banks, analyse the current state of the loan portfolio of the Ukrainian banking sector, and identify the most promising methods of optimising potential risks to its quality.

The study examines the essential features of the bank credit risk as well as the most common methods for its assessment. On the basis of a deep analysis of the Resolution of the National Bank of Ukraine No. 351, a detailed algorithm for calculating the amount of bank credit risk is proposed, and its main principles, which are important for the activities of domestic banks, are described. A statistical study of the quality of the loan portfolio of the banking sector of Ukraine for the time horizon of 2018 – 2024 is carried out and a gradual adaptation of the sector's entities to the unstable conditions of the operating environment is revealed. The results of the analysis also pointed to a deterioration in the level of credit risk coverage of non-performing customer debt in the period 2022 – 2024, which may have negative consequences for the banking sector's resilience. Based on the results of the study, the possible methods of optimising credit risk have been proposed, which application will have a significant positive effect on the financial stability of the sector and, as a result, the development of the national economy.

A promising area for further research is the study of the possibilities of introducing digital tools for monitoring, controlling and preventing the growth of credit risk in banks.

Keywords: credit risk, loan portfolio, non-performing loans, regulation, optimisation, financial stability

JEL Classification: E51, E58, G21, G28

INTRODUCTION

At the current stage of development, which is characterised by constant volatility and instability of the national economy, the issue of effective risk management is particularly relevant for banks, as well as for any business entities. The deteriorating financial situation and crisis trends in the country against the backdrop of full-scale military operations are currently having a significant impact not only on the performance of the banks themselves, but also on the solvency of households and businesses, thereby increasing the importance of credit risk, which directly affects the liquidity and stability of the banking sector. In addition, the importance of this issue for banks is becoming more acute against the backdrop of tighter regulatory requirements of the National Bank, a dynamically growing share of non-performing loans in the banking sector's portfolio and, as a result, the need to form additional provisions to cover potential losses from them, the inability to predict and adequately forecast their activities, etc.

It is important to understand that lending is not only one of the most profitable operations in banking, but it is also important for the country's economic development, redistributing free resources to those areas that need them for their expanded reproduction. In view of this, the study of approaches to assessment and methods of optimising credit risk allows banks not only to maintain the stability of their operations in a crisis, but also to continue to support the development of the national economy through lending to the

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real sector. The study of this issue is also of a strategic nature, as it allows for the development of new, innovative approaches to risk management and credit policy that can form the basis for future reforms of the domestic banking sector.

The research is based on the following hypothesis: a comprehensive assessment of a bank's credit risk is an important stage and a prerequisite for effective management of the loan portfolio and optimization of the risk associated with it.

LITERATURE REVIEW

Credit risk is a complex category that combines economic, legal, organisational and information aspects of banking institutions' activities. Credit risk itself is not a static phenomenon; it is constantly changing under the influence of external shocks, changes in legislation, development of financial technologies and banking innovations. At the same time, the main features characteristic of this category remains static and, based on the analysis of scientific literature, are as follows:

- The probability of additional financial losses or damages, based on the concept of the probabilistic nature of risk, which results in unpredictable financial losses;
- Failure of the borrower to fulfil its obligations: K. Larinova and T. Donchenko (2020) emphasise that credit risk is "the monetary expression of the consequences of the borrower's breach of its obligations";
- Non-return of debt: O. Kubetska & B. Udovikova (2022) notes that the main sign of credit risk is a violation of credit discipline by the client, namely "failure to repay the principal and interest on the loan due to the lender in accordance with the loan agreement";
- Deterioration of the borrower's financial condition: failure of borrowers to fulfil their obligations due to objective and subjective reasons. In particular, V. Fedina (2023) notes that in addition to the borrower's inability to fulfil obligations to the lender, it is also possible that he or she is unwilling to do so;
- Changes in the value of bank assets and capital: credit risk has negative consequences for the bank's activities, including in terms of financial stability indicators. In his works, S. Pokhylko & V. Novikov (2019) considers this category as "an existing or potential risk for revenues and capital ...". O. Kubetska & B. Udovikova (2022) also draws attention to the possibility of a negative impact of credit risk on the bank's liquidity.

Taking into account the identified features of credit risk in modern practice, this category can be understood as the likelihood of losses or additional financial losses of the bank due to the borrower's unwillingness or inability to meet its obligations to timely and fully pay the loan amount and accrued interest on it, which, as a result, may lead to a decrease in the value of the bank's assets and capital, as well as affect other performance indicators. It is also important to understand that, in addition to its complex nature, credit risk has a number of significant features, which are particularly important in the process of risk management (Figure 1).

The data in Figure 1 confirm the significant specificity and, at the same time, the importance of credit risk for banking activities. First and foremost, the need for special attention to it is heightened by its close relationship with other types of risks. For example, an increase in credit risk may lead to a loss of liquidity and market value of the assets owned by the institution, increase operational threats, etc. At the same time, there is also an inverse relationship – an increase in inflation, currency or interest rate risks is guaranteed to lead to a deterioration in the quality of the loan portfolio, which is one of the manifestations of credit risk.

At the same time, the analysed economic category has other peculiarities, such as dynamism and uncertainty of consequences, since the lending activity of banks is highly dependent on the influence of various factors of the environment of both the lender and the borrower. It is also important to understand the dual nature of credit risk, as the management of credit assets in a bank is carried out in two dimensions – individual and portfolio, which ensures the maximum possible attention of management to this area of activity. At the same time, the issue of subjectivity of credit risk assessments, which depend on a number of factors, such as the completeness and reliability of available information, expertise of the bank's employees, efficiency and correctness of the credit policy, etc., remains unresolved.

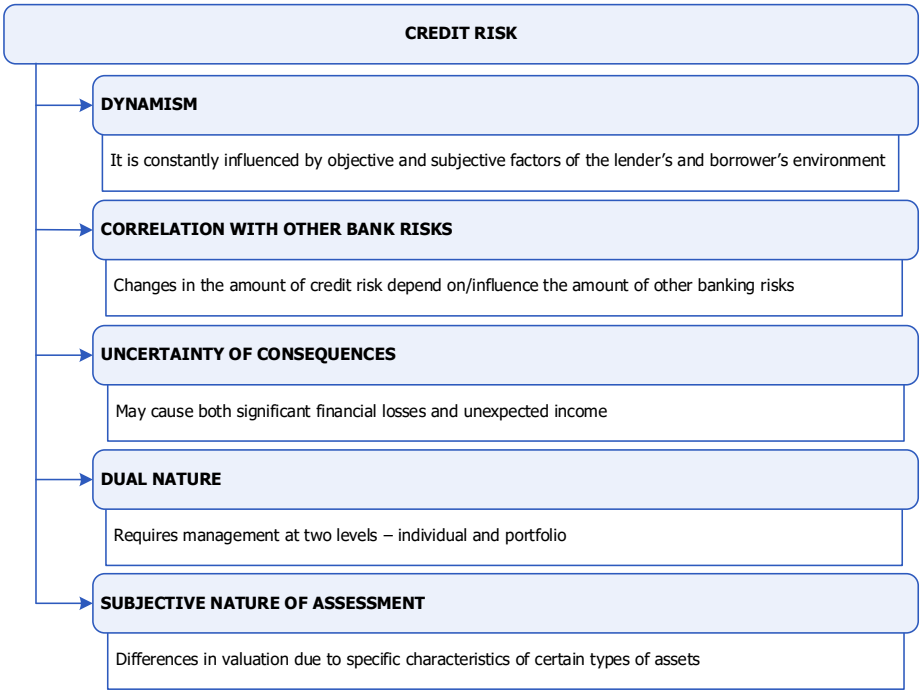

Figure 1. Significant features of credit risk. *(Source: developed by the author on the basis of K. Larinova & T. Donchenko, 2020; I. Sadchykova & A. Onoprienko 2022)*

AIMS AND OBJECTIVES

Given the critical importance of bank lending in the current environment, the purpose of this paper is to study approaches to determining the size of a bank's credit risk in the context of legislative norms, as well as to consider possible methods of optimising it in order to maintain the financial stability of the banking sector. In order to achieve this goal, the study set and fulfilled the following objectives:

- to consider the main features and essential characteristics of the bank credit risk category;
- to systematise the legal requirements for determining the amount of a bank's credit risk based on the National Bank of Ukraine Resolution No. 351
- to analyze the current state of the loan portfolio of the banking sector of Ukraine in the context of its riskiness;
- determination of the most appropriate methods of optimising credit risk for the domestic banking sector.

METHODS

In the course of the study, a number of methods of scientific knowledge were used. In particular, the method of scientific abstraction, comparison and logical generalisation, and the bibliographic method were used in the course of the review of scientific literature. In analysing the current state and dynamics of credit risk in the banking sector of Ukraine, the author used generalisation, systematisation, synthesis and detailing of data, comparative and statistical analysis, as well as analytical, tabular and graphical methods of research and data presentation.

RESULTS

Credit risk assessment is one of the most important elements of the bank's loan portfolio management. In particular, it is carried out by comparing potential income and possible losses from lending transactions. The results of the assessment serve as the basis for the bank's decision-making on methods and strategies for managing the loan portfolio. The effectiveness of credit risk assessment depends, among other things, on the appropriateness of the chosen assessment method. Today, a number of strategic, expert, analytical and combined methods of credit risk assessment are available to banks (Table 1).

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Table 1. Methods of credit risk assessment. *(Source: compiled by the author based on (Chuenjitwongsa D. S., 2017; IBM; Rashid F., Khan R. A., & Qureshi I. H., 2023; Pavliuk O., & Melnyk T., 2022)*

Method	Essence	Advantages	Disadvantages
Statistical methods			
Monte Carlo method	Use of random simulations to model possible credit loss scenarios and determine risk distribution	Full reflection of loss distribution with probability; suitable for stress tests and complex analysis	High requirements for computing resources and data quality; results are sensitive to assumptions
Altman Z-model	Discriminant analysis based on financial ratios for default prediction (Z-score)	Easy interpretation of results with sufficient precision; relatively quick and easy to use tool with sufficient data	Does not take into account systemic shocks and quality risks
VaR method	Determines the maximum potential loss of a portfolio at a given level of risk	Widely used regulatory tool (used by Basel); allows for comparison	Focuses on the middle part of the distribution, may underestimate crisis risks
Expert evaluation methods			
Delphi method	Based on expert surveys with interactive review of answers until consensus is reached	Can be used in case of lack of estimated data; takes into account human experience	Subjective evaluation; results depend on the competence of experts
Decision tree method	Building a default classification 'tree' based on the selection of consistent financial and non-financial features	Intuitive and easy to interpret; answers the question "what happens if..."	Sensitivity to the quality of input data
Ratio analysis method	Calculation of key financial ratios and comparison of the obtained values with the regulatory ones	Simplicity, possibility of application even in crisis conditions	Limitation to purely quantitative characteristics, does not take into account qualitative risks
Rating method	Assignment of ratings based on financial, qualitative, industry criteria	Easy integration with banking processes, clarity	Time lag in response to changes in the macro environment
Analytical methods			
GAP-analysis	Factor analysis of the impact of interest rates on the institution's profitability and liquidity	Allows to identify interdependencies of indicators	Time-consuming, need for detailed information
Other methods			
Analogies method	Assessment of the risk level by analogues of other banks or situations of similar nature	Highly effective under normal conditions; application in case of inefficiency of other methods	Impossibility of finding a complete analogue; risk of mismatch
Combined method	Combination of several methods (statistical, analytical, expert) for a synergistic effect	Highly effective in both normal and crisis conditions; comprehensive assessment	Requires significant resources and data sets; labour intensive

Thus, a bank has a wide range of credit risk analysis methods, each of which has individual advantages and disadvantages. At the same time, each bank must also comply with the legal requirements regarding the amount of credit risk, which has a significant impact not only on the quality of the loan portfolio but also on the efficiency of the entire institution. In view of this, banks are increasingly choosing the credit risk assessment methodology proposed by the regulator.

The NBU Resolution No. 351 "On Approval of the Regulation on Determining the Amount of Credit Risk for Active Banking Operations by Ukrainian Banks" (Resolution of the NBU No.351, 2024) defines credit risk as "the amount of expected losses (damages) on an asset as a result of default by a debtor/counterparty". In other words, the interpretation of the category is reduced to its quantitative expression through the amount of probable losses that the bank must calculate, forecast and manage. In view of this, it is increasingly important to calculate the amount of a bank's credit risk for certain types of assets owned by it, as well as to further work with this aspect in order to optimise potential negative consequences for the institution's operations.

According to Regulation No. 351 of the National Bank of Ukraine (Resolution of the NBU No.351, 2024), the bank independently determines the amount of borrower credit risk on both a group and individual basis, regardless of whether the borrower is an individual or a legal entity (Figure 2). To this end, the bank analyzes the loans granted to the counterparty, its investments in other institutions, its financial and commercial receivables, etc. Based on such an assessment, the bank may assign a potential borrower to the appropriate class of debtor's reliability and subsequently decide whether to grant or deny a loan, thereby protecting itself from potential credit risk or minimizing its negative impact.

Credit risk is the amount of expected loss (damage) on an asset as a result of default of the debtor/counterparty (Resolution of the NBU No.351, 2024). The approaches to assessing a bank's credit risk set out in NBU Resolution 351 cover a wide range of counterparties – corporate clients, individuals, financial institutions, and government agencies. In other words,

banks should perform such an assessment for all counterparties to take into account all possible sources of risk. This becomes especially important in the current environment of significant instability, when each counterparty is significantly influenced by various factors. It should also be noted that, in addition to the wide coverage of counterparties, the types of active transactions for which the bank must calculate the amount of credit risk are also significant. In other words, the objects of such calculation include not only loans, but generally all types of transactions where there is a possibility that the counterparty may not return the amount of funds received earlier. Thus, the NBU's approaches to credit risk assessment are a response to the challenges of the current changing conditions of the Ukrainian banking sector.

In order to calculate the amount of credit risk on an asset in accordance with the requirements of the NBU Regulation No. 351 "On Approval of the Regulation on Determination of the Amount of Credit Risk on Active Banking Operations by Ukrainian Banks" (2016) and internal regulations, domestic banks determine the value of each of the credit risk components (PD, LGD and EAD) depending on:

- type of debtor/counterparty (legal entity, individual, budgetary institution, bank, debtor-issuer of securities)
- type of asset;
- type of collateral;
- debt currency (national or foreign);
- method of asset valuation (on an individual, group or simplified basis).

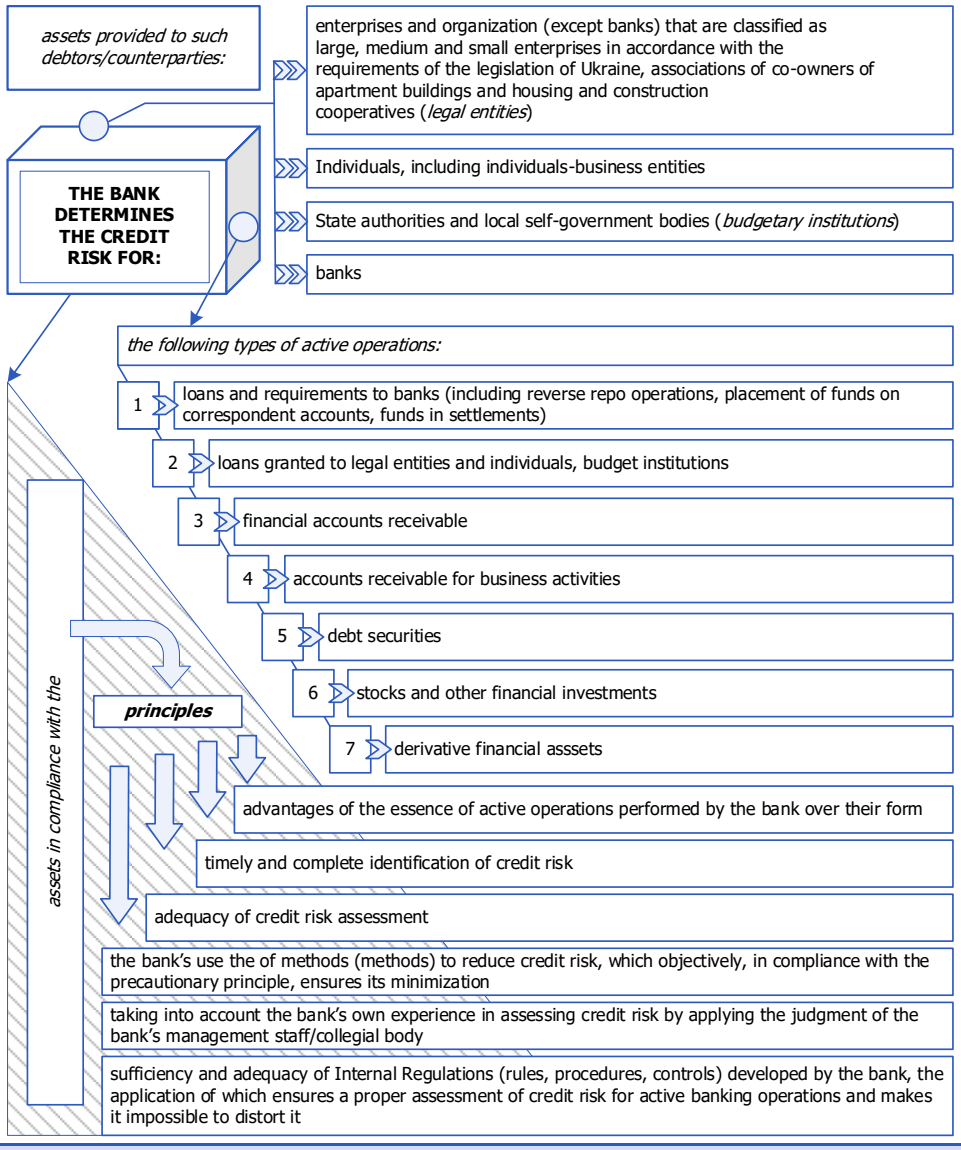

Figure 2. General approaches and principles for determining credit risk by assets. *(Source: systematized by the authors based on Resolution of the NBU No.351, 2024)*

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Credit risk is calculated on an individual basis for assets that have unique characteristics or pose a significant threat in the event of a risk realization. Such assets include, in particular, large loans to corporate customers, transactions with government agencies, assets related to complex financial instruments, etc. Aiming to ensure the most accurate assessment of credit risk, considering all specific characteristics of assets, this approach allows for a sufficiently in-depth risk analysis and adaptation of the model to specific changes and characteristics of the counterparty. Therefore, despite the significant financial, resource, and time costs of this type of credit risk assessment, as well as the need to collect a big amount of data, the high accuracy and wide coverage of the elements make it indispensable for large and even critical active transactions.

Unlike the previous method, group-based credit risk assessment is applied to assets with similar characteristics that can also be combined into portfolios. In banking practice, this method is usually applied to consumer lending, standard mortgages and loans to small and medium-sized businesses, etc. Credit risk assessment on a group basis addresses the main disadvantages of the previous approach, namely, it optimizes the assessment process and thereby helps the bank save time and resources, automates the process, and increases the ability to assess a significant amount of risks. At the same time, the grouping of similar assets results in the loss of unique characteristics that may have a significant impact on the realization of credit risk in the event of relevant external factors. In other words, the group method of credit risk assessment provides a certain balance between the accuracy and efficiency of this process, which makes it very important for analyzing large portfolios of homogeneous assets.

Simplified credit risk assessment is applied by banks to a limited range of assets with low risk or standardized characteristics, such as government securities or loans with full coverage by liquid collateral. In other words, this approach is designed to quickly calculate the indicator with minimal time and resources in cases where a thorough assessment is not necessary. In general, the main difference between this valuation method and the previous ones is the level of detail of the analysis, as well as the scope and amount of information required for the calculation. In addition to the characteristics of the assets themselves, the choice of a particular approach also depends on the bank's internal rules and approaches, its strategy and priorities for credit risk management. Taken together, the calculation of credit risk on an individual, group, and simplified basis forms a comprehensive methodology aimed at maintaining the stability of the Ukrainian banking sector by taking into account the specifics of domestic banking practice. The bank's calculation of credit risk by assets on an individual, group, and simplified basis is shown schematically in Figure 3.

The key stage for the bank is the interpretation and integration of the assessment results, regardless of the level of its implementation, into the credit risk management system, which further contributes to the appropriate determination of the amount of provisions for credit risk, and is used in the development and adjustment of credit policy to take into account current market conditions in the most efficient way. The main purpose of using the obtained credit risk values is to form adequate provisions for active operations, which is also one of the prerequisites for the financial stability of the institution. In this way, banks have the ability to adapt their lending policy by limiting its activity or, for example, offering stricter lending terms for high-risk segments. In general, by implementing the above approaches to credit risk assessment, the bank gains the necessary flexibility, which in the long run will contribute to the efficient use of capital, as well as minimize potential financial losses of the bank in the event of adverse factors. In addition, the integration of the data obtained into the credit risk management sector helps to increase the balance of the bank's loan portfolio itself, which is also an important aspect of maintaining the stability of the bank's operations. It is the assessment of credit risk on an individual, group and simplified basis that helps the bank to detect excessive risk growth on individual assets or their groups in a timely manner, thereby reducing its dependence on excessive risk.

In addition to the positive aspects of applying the approaches set out in the NBU Resolution No. 351 (2016), it is also important to note its significant correlation with international practices, namely the Basel requirements and IFRS, which is extremely important given the European orientation of the domestic banking sector. For example, Basel III (2011) primarily focuses on increasing the resilience of banks by strengthening capital, liquidity, and risk management requirements. In its turn, the NBU, by the analyzed regulatory act, similarly provides a structured approach to credit risk assessment, based on which banks are required to form appropriate provisions that directly affect both the quality and adequacy of capital and the stability of their operations in general. In addition, the requirement of the national regulator to calculate credit risk on both a portfolio and individual basis is comparable to the approach to internal risk assessment models (Basel III, 2011), which also considers the probability of default, losses in the event of default, and exposure to risk. At the same time, the requirements of Basel III (2011) cannot be fully implemented for the domestic banking sector due to a significant number of environmental factors and require adaptation. One of such adaptations is, in particular, a simplified approach to assessing a bank's credit risk in Resolution No. 351 (2016), which in turn allows for consideration of national peculiarities without denying international standards.

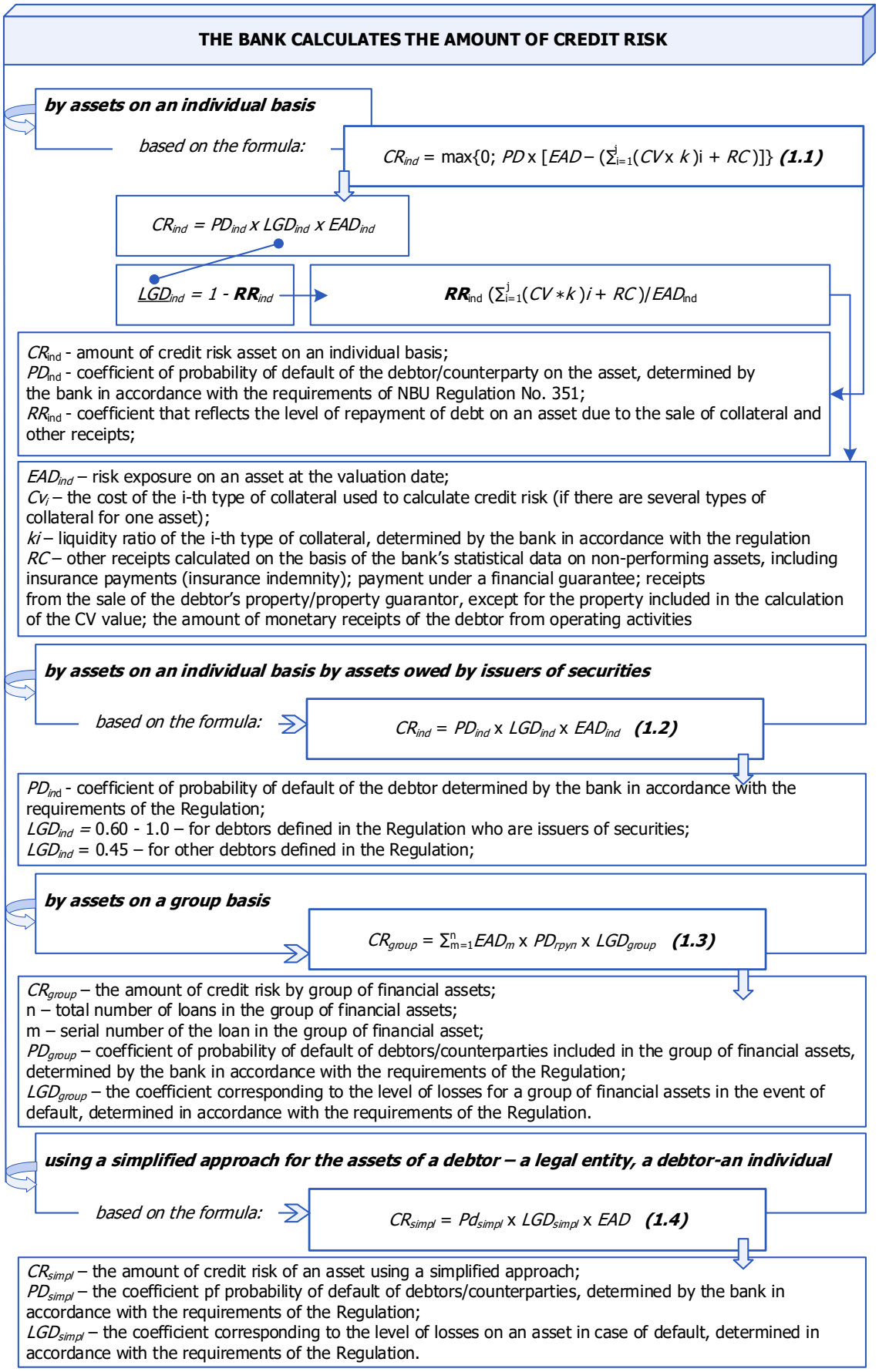

Figure 3. Methodology for calculating the amount of credit risk on active banking operations. *(Source: systematized by the authors based on Resolution of the NBU No.351, 2024)*

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The analyzed legislative act is also based on the approaches set out in IFRS 9 "Financial Instruments" (2021). In particular, the principle of expected credit losses, which is available in both documents, allows for a more reasonable, but at the same time flexible, assessment of the required amount of provisions for credit transactions, which would consider both the current state of assets and potential risks on them in the future. Overall, this approach is essential in the current banking sector environment, as it facilitates timely provisioning for active operations, which guarantees financial stability even in the event of a significant increase in credit risk. In combination with the adapted requirements of Basel III (2011), such international approaches not only improve the credit risk management process of domestic banks but also create conditions for the recovery and sustainable development of the industry in today's extremely dynamic and competitive environment.

In general, the credit risk assessment methodology set out in NBU Resolution No. 351 (2016) has a number of significant advantages over other risk assessment methods, as shown in Table 1. First and foremost, it is in line with the international regulatory framework, which is extremely important for the Ukrainian financial sector in the context of European integration processes. In addition, this methodology more fully covers different customer segments through a combination of econometric and scoring models, as well as a combination of statistical, qualitative, and expert approaches. In the context of elevated systemic risk, which is also inherent in the Ukrainian market today, an additional advantage of legislative approaches is the possibility and regulation of the risk analysis process for groups of companies, not just for each individual borrower. Thus, the main features of the methodology set out in Resolution No. 351 (2016), which also significantly contribute to improving the characteristics of the loan portfolio, include the following:

- multi-parameter and multi-stage approach, which provides flexibility of assessment;
- credit risk assessment with consideration of group ties;
- special approaches to credit risk assessment for project/construction financing;
- integration of credit register data, which facilitates better monitoring of the borrower's financial condition and prevention of signs of its deterioration.

Thus, the methodology set out in the Resolution No. 351 (2016) provides a comprehensive and regulatory-compliant, yet flexible, credit risk assessment system. Unlike classical methods, it brings the Ukrainian banking sector closer to international standards, while remaining adapted to the specifics of the domestic market.

The importance of making appropriate risk calculations is primarily driven by the significant importance of the banking sector's loan portfolio in the context of Ukraine's economic development. The overall stability and resilience of the sector depends on the quality of the aggregate of loans of each individual bank, which, in turn, affects the macroeconomic situation in the country. This is evidenced by the significant share of the banking sector's loan portfolio in Ukraine's GDP (Figure 4).

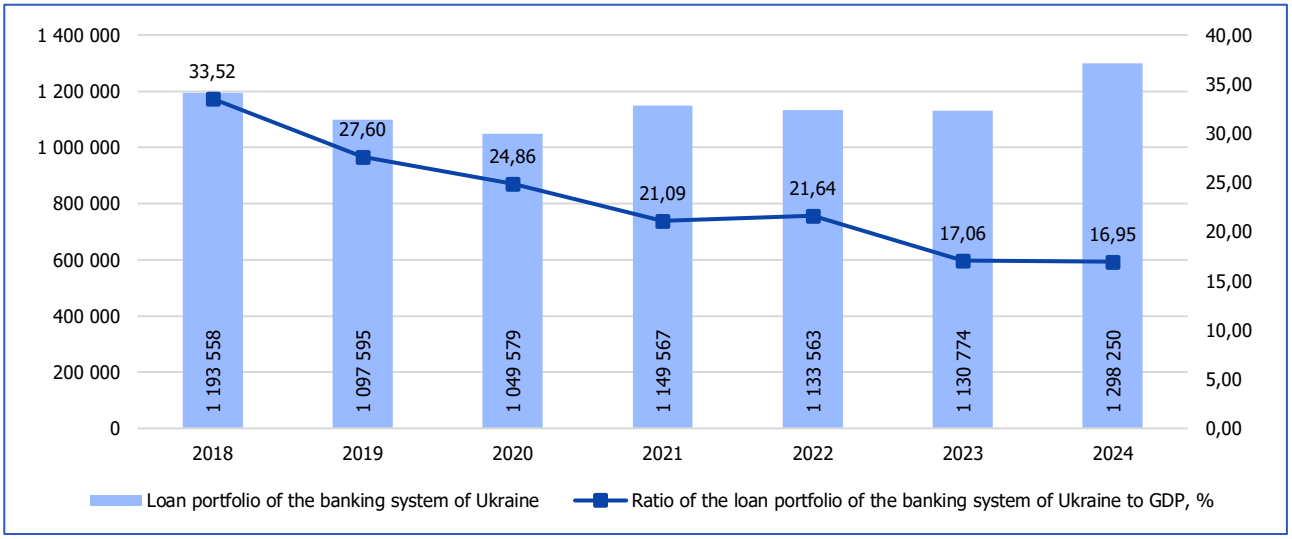

Figure 4. Share of bank lending in Ukraine's GDP in 2018 – 2024, UAH million. *(Source: compiled by the authors on the basis of State Statistics Service of Ukraine, 2025; Supervisory Statistics, 2025)*

Figure 4 shows that in 2018 – 2024, bank lending accounted for an average of 23,25% of Ukraine's GDP. This may indicate a rather low level of financial intermediation in the country – the banking sector was poorly integrated into financing the real sector and the population, which met their needs at the expense of their own funds or other alternative sources. This

indicator is also characterised by a downward trend, with a total decrease of 16,57 percentage points over the period. We can conclude that in the last few periods, banks have been further restricting lending, due to the negative impact of a number of exogenous factors.

The observed decline in the share of bank lending in Ukraine's GDP is quite justified given the unstable situation in the country and the growing uncontrollable threats. However, it may have a significant negative impact on the real sector and, consequently, on the country's overall economic recovery. Since banks, through their transformational function, provide access to financial resources for other business entities, the conservation of their lending policy leads to significant imbalances, reducing the economy's ability to expand.

The conservatism of the credit policy of the Ukrainian banking sector in recent years is a reasonable phenomenon given the current macroeconomic situation. Military events and general socio-political instability in the country lead to a significant, uncontrolled increase in credit risk and, consequently, unpredictable financial losses. Given this, and the desire to maintain not only their financial stability but also profitability, banks have been actively investing their free resources in government securities, especially deposit certificates of the National Bank of Ukraine, since the start of the full-scale invasion in 2022. On the one hand, this has a positive effect on the sector's performance indicators, but on the other hand, the outflow of funds from the lending sector has a negative impact on the economy, slowing its recovery and reducing opportunities for further development.

The main reason for banks' reluctance to lend to the economy is the uncontrolled growth of risks. For example, even with proper calculations and careful selection of borrowers, military threats can lead to the realisation of credit risk. Due to the impossibility of forecasting and appropriate loan portfolio management in the current environment, banks also face the problem of a significant deterioration in the quality of their loan portfolios (Figure 5). Today, they are faced with the task of not only thoroughly analysing and selecting new loan applications, but also effectively managing their existing loan portfolio, which was formed in previous periods.

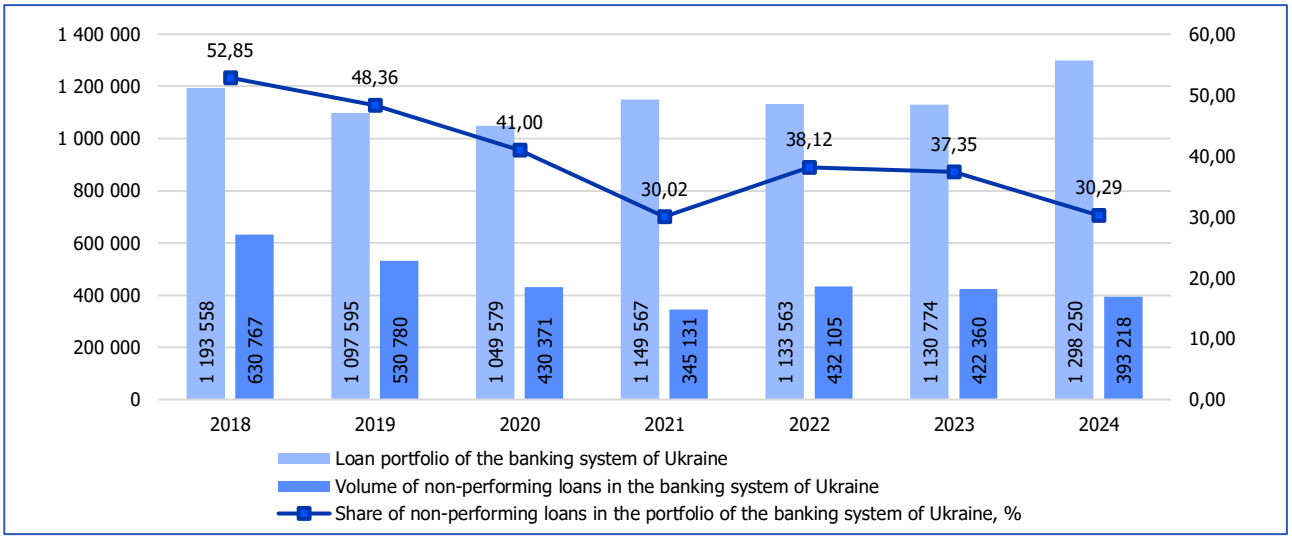

Figure 5. Assessment of the quality of the loan portfolio of the banking sector of Ukraine for the period 2018 – 2024, UAH million.
(Source: compiled by the authors based on Supervisory Statistics, 2025)

The overall dynamics of the volume and share of NPLs in the portfolio of the Ukrainian banking sector in 2018 – 2024 is quite positive, with a decrease of UAH 237 549 million in absolute terms or 37,66% in relative terms. In other words, while in 2018 more than half of the total loans of Ukrainian banks were of low quality, as of the end of 2024 this figure was 30,29%. This development is quite positive and may indicate that the institutions are working quite effectively to ensure the high quality of their assets, especially in the last few periods characterised by high volatility. However, the share of non-performing loans in the portfolio, as well as their almost unchanged volume in absolute terms, may indicate certain difficulties in the context of risk management, among other things.

In 2022, there was a significant deterioration in the quality of the loan portfolio of the Ukrainian banking sector – the volume of non-performing loans increased by UAH 86 974 million, or 25,20%, which is significant compared to the downward trend in previous periods. This trend is further negatively affected by the overall decline in lending activity of institutions, which are interrelated phenomena. Thus, in 2022, 38,02% of customer debt was of poor quality. At the same time, in the next two periods, we may see a gradual decline in this indicator, which may indicate that the banking sector is

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actively working to improve the quality of the loan portfolio, as well as a certain level of adaptation to the current operating environment. As of the end of 2024, the share of NPLs almost equaled the value of 2021 and amounted to 30,29%, which is still high but not critical.

In the context of this situation, the issue of credit risk is of particular importance. According to the NBU Resolution No. 351 [15], the essence of this category is to determine the level of required provisions based on a detailed risk assessment for each type of asset (Figures 2 – 3). In other words, this indicator, according to the legislative approach, indicates the extent to which the bank is ready to compensate for potential losses for each asset class. In addition, the higher the level of coverage by the calculated provisions (credit risk), the lower the possibility of incurring significant losses or other losses in the event of unforeseen force majeure factors. Let's look at the amount of credit risk and the level of asset coverage in the Ukrainian banking sector (Table 2). In order to assess the quality of the loan portfolio, we will examine the credit indebtedness of class 10 business entities and class 5 individuals, which reflects non-performing assets.

Table 2. Amount of credit risk coverage of non-performing assets of the banking sector of Ukraine by lending entities for the period 2018 – 2024, UAH million. *(Source: compiled by the authors based on Supervisory Statistics, 2025)*

Performance indicator	Year						
	2018	2019	2020	2021	2022	2023	2024
Exposure to non-performing loans to businesses (class 10)	528.614	456.074	371.157	301.665	362.282	365.483	346.937
Credit risk exposure on loans to businesses (class 10)	464.795	424.507	341.330	282.959	309.868	311.741	296.686
Level of credit risk coverage of credit exposures to business entities, %	87.93	93.08	91.96	93.80	85.53	85.30	85.52
Volume of non-performing credit exposures on loans to individuals (class 5)	90.096	73.077	58.230	43.210	6.525	56.636	45.771
Credit risk on loans to individuals (class 5)	75.315	64.211	50.226	38.999	4.329	51.361	41.319
Level of credit risk coverage of credit exposure to individuals, %	83.59	87.87	86.25	90.25	66.34	90.69	90.27

The table demonstrates a fairly high level of credit risk coverage of NPLs in the sector throughout almost the entire period under review. At the same time, we see a certain decline in 2022, which is especially evident in lending to individuals. In 2022, there was a significant reduction in both NPLs (asset class 5) and credit risk, with the latter declining more significantly. It is clear that such changes were mainly due to the almost complete suspension of consumer lending in the sector due to its high riskiness. The 23.91 pp decline in the credit risk coverage ratio to 66,34% in 2022 is evidence of a significant deterioration in the quality of banks' loan portfolios, with the credit risk provisions covering only slightly more than half of NPLs, which could lead to significant losses and loss of financial stability in the event of a further deterioration in the macroeconomic situation.

Similar dynamics were observed in the loan portfolio of business entities, but the level of credit risk coverage for NPLs remained significantly higher even in 2022, at 85,53%, which was generally not critical for the institutions' operations. However, unlike lending to individuals, whose NPL coverage ratio returned to pre-war levels in 2023 – 2024, the NPL coverage ratio for legal entities remained at the 2022 level, fluctuating slightly around 85%. It should be noted that in 2021, this indicator was 93,80%, which means that the value for 2023-2024 is lower and requires attention from bank management.

Given the ongoing uncertainty in the external environment, it is advisable for banks to make loan loss provisions that could cover customer debt as much as possible, especially the portion of it that shows signs of deterioration. We understand that, given the record profits of the Ukrainian banking sector in 2023 – 2024 (National Bank of Ukraine, 2024), the increase in provisions is quite realistic and will not have a deterrent effect on the development of banks. In addition, it will help to significantly minimise the potential negative consequences of credit risk, which is one of the most important tasks of the banking sector in the current environment.

Since the existence of risk is an objective phenomenon in the economic environment, banks should focus primarily on finding possible methods to maintain stability of their operations and increase profitability, provided that a certain level of risk is accepted, in other words, to reduce the negative impact on their operations and neutralise the consequences of threats of various kinds. Optimisation of credit risk can be achieved by using a number of instruments that together should ensure the most optimal impact on the possibility of its realisation (Table 3).

Table 3. Methods of optimising the bank's credit risk. *(Source: compiled by the author based on Huynh, Dang, 2021; Alktrani, Talib, 2021; Bogrinovtseva, Zaichko, Fedina, 2024; Khoma, 2024; Shilo, 2021; Marchenko, Petrykiva, Korobko, 2022)*

Method	The essence of the method
Internal methods of optimising credit risk	
Diversification	Distribution of the bank's portfolio credit risk among a wide range of borrowers that differ in terms of operating conditions (regional diversification), business area (industry diversification), scale, capital, ownership, term and amount of the loan, etc.
Limitation	The establishment by the internal policies of banks of certain restrictions on the maximum amount of a loan to a single borrower or a group of borrowers, the level of risk involved, and the determination of limits on other material terms of a loan agreement
Provisioning	Deducting a certain portion of the total loan amount to specially created reserves for this line of business to compensate for possible losses and other financial losses of the bank in the event of a credit risk realisation
Assessment of the borrower's creditworthiness	Detailed analysis by a bank employee of financial indicators, as well as reputation, integrity, credit discipline, and professional abilities of each individual borrower in order to avoid unforeseen consequences
Loan collateral	Receipt by the bank of the amount of funds specified in the loan agreement in the form of collateral for the purpose of its further use to compensate for losses in case of default by the borrower
External methods of optimising credit risk	
Government regulation	The NBU sets capital requirements, reserves and credit risk limits for second-tier banks, as well as periodic stress tests to assess the stability of the banking sector
Insurance	Cooperation between the bank and an insurance company to protect all parties to credit relations from risks
Cooperation with credit bureaus	Cooperation between the bank and credit bureaus to obtain the most complete and reliable information for a thorough assessment of the risk level of each borrower
Sale of non-performing loans	Banks transfer non-performing loans to collection firms in order to avoid possible significant losses or other financial losses
Guarantees from third parties	The bank obtains guarantees from third parties (including the state) for the borrower's loan repayment, which reduces the risk of non-repayment
Engagement of external auditors and financial analysts	Periodic use of services of external auditors and financial analysts to eliminate the possibility of making mistakes in assessing and controlling the level of credit risk
Securitisation of loan assets	Transformation of the bank's loan assets into securities with their subsequent sale to a specialised financial institution that manages risky assets

As shown in Table 3, banks today have a significant number of methods to optimise credit risk, the application of which should be made, among other things, depending on the nature of the object of management. Thus, at the level of each individual counterparty, compliance with the established bank policies, procedures, standards, as well as the maximum permissible loan commitment amounts, maturity and collateral coverage level should be monitored. With regard to portfolio credit risk, one of the main methods of managing it is diversification and limiting the acceptable level of debt concentration in terms of industry, currency, term or product.

DISCUSSION

The dynamism of the banking environment, as well as the emergence of additional factors influencing credit risk, necessitates the search for new tools to reduce its negative impact on the bank's operations. The general areas of improvement of the process of managing and optimising credit risk of banks are as follows:

- development of a step-by-step process for managing and reducing the level of credit risk both at the level of individual loans and at the portfolio level;
- implementation of its own modern methodology for assessing and reducing the impact of credit risk;
- automation of the process of detecting signs of loan problems (Yu. Shumeiko, L. Hrytsenko, H. Daher, 2022);
- improvement of the information support aspect of the credit risk management and mitigation process;
- conducting stress testing of the loan portfolio aimed at assessing the impact of various scenarios (including military events in the country) on the stability of the bank's operations;
- development and implementation of a system for monitoring and rapid response to any changes in the external environment, which will facilitate timely detection of threats to the bank's operations, etc.

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In addition, in the current environment, domestic banks need to carry out a detailed analysis and assessment of their loan portfolios with the subsequent identification of those sectors that are most vulnerable in the current operating environment. Banks should pay considerable attention to the development of their own system of quantitative and qualitative indicators, as well as their optimal and critical values in terms of individual risk elements, which could provide a significant basis for the entire further process of credit risk management (I. Dotsenko, 2024).

The possibility of widespread introduction of digital tools into the credit risk management process is currently being actively explored, in particular because of their broad capabilities to analyse and automate the assessment of all possible threats for each loan application, which will in the future increase the accuracy of decision-making on the provision of funds (L. Hrytsenko, O. Pakhnenko, A. Kuzior & I. Kozhushko, 2024). Due to their ability to process large amounts of data in real time, including from alternative sources (social networks, Internet activity, use of funds, etc.), as well as the use of special algorithms to identify behavioural patterns and predict risk opportunities, these technologies will be highly successful in terms of credit risk management, which is expected to provide banks with significant opportunities to optimise the negative consequences of potential threats (L. Hrytsenko, L. Zakharkina, O. Zakharkin, V. Novikov & R. Chukhno, 2022).

CONCLUSIONS

Thus, credit risk is a complex and sophisticated economic category that has a significant impact on the banking sector and, as a result, on the possibility of economic recovery and further development of Ukraine. Given the significant unpredictable threats and challenges those banks are constantly facing today, the issue of identifying and managing credit risks is still very relevant. The stability of not only an individual bank but also the entire sector depends on a reliable and complete assessment and the use of appropriate methods to minimise the impact of credit risk.

The study made it possible to identify the main features of credit risk and to systematise legislative approaches to determining its size. The statistical analysis of the current situation demonstrated sufficient efficiency of the credit activity of the domestic banking sector despite the negative impact of exogenous force majeure factors. In addition, the most appropriate methods for optimising the bank's credit risk under current conditions have been identified, the use of which will contribute not only to stabilising the banking sector, but also to accelerating the expanded reproduction of the economy as a whole. Further research should be carried out to explore the possibilities of digitalising the process of selecting loan applications and assessing the feasibility of introducing such innovations.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All Authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

REFERENCES

1. Basel Committee on Banking Supervision. (2011). *Basel III: A global regulatory framework for more resilient banks and banking systems.* Bank for International Settlements. https://www.bis.org/publ/bcbs189.pdf
2. Bogrinovtseva, L. M., Zaichko, I. V., & Fedina, V. V. (2024). Managing the bank's credit risk in the financial market: A theoretical aspect. *Digital economy and economic security*, *2*(11), 283-289. https://doi.org/10.32782/dees.11-46
3. Chuenjitwongsa, D. S. (2017). Conduct a Delphi Study. *Cardiff University*. https://www.cardiff.ac.uk/__data/assets/pdf_file/0010/1164961/how_to_conduct_a_delphistudy.pdf
4. Dotsenko, I. (2024). Credit risk management of banking institutions under martial law. *Modeling the Development of the Economic Systems*, (1), 156-162. https://doi.org/10.31891/mdes/2024-11-22
5. Economic statistics. National accounts. (2025). *State Statistics Service of Ukraine*. https://www.ukrstat.gov.ua/

6. Fedina, V. V. (2023). Bank credit risk: Essence and causes of occurrence. *Entrepreneurship and Trade*, *39*, 223-228. https://doi.org/10.32782/2522-1256-2023-39-27

7. Fedina, V. V., & Zaichko, I. V. (2024). European experience in managing credit risks of banks. In Business development in the context of European integration: global challenges, strategic priorities, realities and prospects (pp. 143-145).

8. Hrytsenko, L., Zakharkina, L., Zakharkin, O., Novikov, V., & Chukhno, R. (2022) The Impact of Digital Transformations on the Transparency of Financial-economic Relations and Financial Security of Ukraine. *Financial and Credit Activity Problems of Theory and Practice*, *3*(44), 165–175. https://doi.org/10.55643/fcaptp.3.44.2022.3767

9. Hrytsenko, L., Pakhnenko, O., Kuzior, A., & Kozhushko, I. (2024). Smart technologies in banking. *Financial Markets, Institutions and Risks*, *8*(1), 81-93. https://doi.org/10.61093/fmir.8(1).81-93.2024

10. Huynh, J., & Dang, V. D. (2021). Loan portfolio diversification and bank returns: do business models and market power matter? *Cogent Economics & Finance*, *9*(1), 1891709. https://doi.org/10.1080/23322039.2021.1891709

11. IBM. What Is Monte Carlo Simulation? (n.d.). *IBM*. https://www.ibm.com/think/topics/monte-carlo-simulation

12. IFRS Foundation. (n.d.). *IFRS 9 Financial Instruments*. IFRS. https://www.ifrs.org/content/dam/ifrs/publications/pdf-standards/english/2021/issued/part-a/ifrs-9-financial-instruments.pdf

13. Khoma, I. B. (2024). Ways to improve the bank's credit risk management in modern conditions. In *Russia-Ukraine war: consequences for the world* (pp. 142-144).

14. Kubetska, O. M., & Udovikova, B. V. (2022). Management, assessment and methods of preventing credit risks of a commercial bank. In *Modernisation of the domestic legal system in the context of global integration* (pp. 365-367).

15. Larinova, K. L., & Donchenko, T. V. (2020). Analysis and problems of assessing the credit risk of Ukrainian banks. *Bulletin of Khmelnytskyi National University*, *Ekonomichni nauky* , *1*, 233-240. http://irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/Vchnu_ekon_2020_1_43.pdf

16. Marchenko, O. V., Petrykiva, O. S., & Korobko, K. O. (2022). Minimising credit risk and improving the quality of the bank's loan portfolio. *Business Inform*, *11*(538), 205-210. https://doi.org/10.32983/2222-4459-2022-11-205-210

17. Mousa Alktrani, S. H., & Hayder Talib, K. (2021). Impact of Concentration and Diversity of Loan Portfolio on The Bank Equity Return: A Cross Country Analysis. *Turkish Journal of Computer and Mathematics Education*, *12*(7), 1950-1962. https://www.researchgate.net/profile/Sundus-Mousa/publication/351263618_Impact_of_Concentration_and_Diversity_of_Loan_Portfolio_on_The_Bank_Equity_Return_A_Cross_Country_Analysis/links/608de390299bf1ad8d6fa8eb/Impact-of-Concentration-and-Diversity-of-Loan-Portfolio-on-The-Bank-Equity-Return-A-Cross-Country-Analysis.pdf

18. National Bank of Ukraine (2025). *Supervisory statistics*. https://bank.gov.ua/ua/statistic/supervision-statist

19. National Bank of Ukraine (2024). *The banking sector received UAH 86.5 billion in profit in 2023, according to operational data*. https://bank.gov.ua/ua/news/all/bankivskiy-sektor-otrimav-865-mlrd-grn-pributku-za-2023-rik-zgidno-z-operativnimi-danimi

20. On Approval of the Regulation on Determining the Amount of Credit Risk for Active Banking Operations by Banks of Ukraine. (2016). *Resolution of the National Bank of Ukraine No. 351*. https://zakon.rada.gov.ua/laws/show/v0351500-16#Text

21. Pavliuk, O., & Melnyk, T. (2022). Analysis of the most common calculation methods "Value at Risk, VaR". *Financial and credit activity problems of theory and practice*, *3*(44), 43–49. https://doi.org/10.55643/fcaptp.3.44.2022.3746

22. Pokhylko, S. V., & Novikov, V. M. (2019). Analysis of existing approaches to managing and minimising bank credit risk. *Bulletin of Sumy State University*, *Series 'Economics'*, *1*, 53-63. https://essuir.sumdu.edu.ua/bitstream-download/123456789/76876/1/Pokhylko_kredytnyi_ryzyk.pdf

23. Rashid, F., Khan, R. A., & Qureshi, I. H. (2023). A Comprehensive Review of the Altman Z-Score Model Across Industries. *The Business Review*, *27*(2), 35–42. https://dx.doi.org/10.2139/ssrn.5044057

24. Sadchykova, I., & Onoprienko, A. (2022). Assessment of the credit risk of a commercial bank under the conditions of the corona crisis. *Problems and prospects of economics and management*, *2*(30), 115-124. https://doi.org/10.25140/2411-5215-2022-2(30)-115-124

25. Shafar, M.V. (2023). Causes of occurrence and methods of minimising the bank's credit risk. In *Financial and credit mechanism of economic and social development* (pp. 143-145).

26. Shilo, Zh. S. (2021). Credit risk of a commercial bank: causes of occurrence and methods of management. In *Modern science and practice* (pp. 21-23).

27. Shumeiko, Yu., Hrytsenko, L., & Daher, H. (2022). Analysis of financial stability to the banking system and assessment level influence of innovative technologies. *Mechanism of an economic regulation*, *3-4* (97-98), 51–56. https://doi.org/10.32782/mer.2022.97-98.12

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КОМПЛЕКСНА ОЦІНКА КРЕДИТНОГО РИЗИКУ УКРАЇНСЬКИХ БАНКІВ

Кредитний ризик є невід'ємним елементом банківської діяльності, визначення та ефективне управління яким у сучасних умовах є вкрай необхідним. Від доцільності та результативності ризик-менеджменту значною мірою залежить фінансова стабільність окремих банків і банківського сектору загалом. Метою цього дослідження є систематизація затверджених на державному рівні підходів до оцінки розміру кредитного ризику банків, аналіз сучасного стану кредитного портфеля банківського сектору України, а також визначення найбільш перспективних методів оптимізації потенційних загроз його якості.

У роботі розглянуто сутнісні ознаки та особливості категорії «кредитний ризик банку», а також найбільш поширені методи його оцінки. На основі ґрунтовного аналізу Постанови Національного банку України № 351 запропоновано детальний алгоритм розрахунку розміру кредитного ризику банку, а також охарактеризовано основні його засади, що мають важливе значення для діяльності вітчизняних банків. Проведено статистичне дослідження якості кредитного портфеля банківського сектору України на часовому горизонті 2018–2024 рр. і виявлено поступову адаптацію суб'єктів сектора до нестабільних умов середовища функціонування. Результати аналізу водночас указали на погіршення рівня покриття кредитним ризиком непрацюючої заборгованості клієнтів у період 2022–2024 рр., що може мати негативні наслідки для стійкості банківського сектору до дії екзогенних факторів. За результатами проведеного дослідження запропоновано ряд можливих методів оптимізації кредитного ризику, застосування яких матиме значний позитивний вплив на фінансову стабільність сектора і, як наслідок, розвиток національної економіки.

Перспективним напрямом подальших досліджень уважаємо вивчення можливостей упровадження цифрових інструментів моніторингу, контролю та попередження зростання кредитного ризику банків.

Ключові слова: кредитний ризик, кредитний портфель, непрацююча заборгованість, регулювання, оптимізація, фінансова стабільність

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