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MANAGEMENT OF FINANCIAL INSTITUTIONS AND RISKS UNDER UNCERTAINTY

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Abstract. The **purpose** of this study is to examine the purpose of this study is to examine the features of managing financial institutions and risks under conditions of uncertainty. The current period of development of the financial sphere is characterized by availability of a significant number of approaches and methods of management through forecasting and assessing risks, their identifying and minimizing. Analysis of recent research and publications has shown that the use of innovative mathematical management methods can minimize risks and provide significant competitive advantages in the future. **Methodology:** general and special methods of system-structural analysis and synthesis, grouping and comparison were used in the research process. The risk management scheme proposed by the NBU for use by financial institutions has been analyzed and supplemented by taking into account reputational risks. The research **findings** show that the existing methods are based on the use of expert judgment and require a significant amount of information that is not always available. It has been proven that the construction, use, calibration and interpretation of results obtained during risk assessment should be handled by a risk committee, whose main task is to monitor, identify and manage risks that arise during the operation of the financial institution. It has been revealed that there is no single complete Bureau of Credit Histories in Ukraine, which is a significant barrier to the effective management of financial institutions. The prospect for further research is the formation of approaches that would allow managing several types of risks, in compliance with all regulations under current legislation. This will make it possible to fully satisfy customers, while the setup of a single bureau of credit histories will minimize risk manifestations.

Keywords: management, financial institutions, uncertainty, credit risks, risk assessment methods

JEL Classification: G18, G20, D81.

INTRODUCTION

Financial institutions management under conditions of uncertainty necessitates consideration of risks, since untimely detection, identification and poor forecasting of consequences can cause significant harm not only to an individual financial institution exposed to the risks, but also to the entire financial system of Ukraine. This fact was confirmed by the events of 2015-2016, when about 40% of banks concurrently went bankrupt due to incorrect risk assessment and management (Neplatospromozhni banky).

Under conditions of uncertainty, management should be based on a prevention strategy, the basis of which is control over a wide range of indicators. Effective risk management is a guarantee of economic security and a high level of competitiveness in the future.

LITERATURE REVIEW

A significant number of publications by both domestic and foreign scholars have been devoted to the issue of financial institutions management under conditions of uncertainty. For example, Chernobai A. and Ozdagli A.K. and Wang J. (2021) identified the problem of inconvenience for big financial institutions to simultaneously monitor and control all risks, as this requires additional administrative resources. Moreover, using regulated means of risk control, financial institutions are not always able to compensate for managerial failures. To address this issue, Malik M., Zaman M. and Buckby S. recommend to set up a risk committee at the level of the company's top management or board of directors, which will make it possible to improve the focus on problematic issues. As a result, the financial institution becomes focused on risk protection and risk management. Establishing a risk management committee is not a panacea and will not solve all the problems at once, but this step helps to concentrate on the development of risk strategy and involve the most experienced employees and managers in that. In continuation of this study, Malik M., Shafie R. and Ku Ismail (2021) recommend entrusting the risk management committee with the function of ensuring the sustainability of the financial institution and increasing its future value. The scholars focus on the experience level of management, whose task is to monitor, predict and manage risks to increase the company's value.

Levchenko N.M., Ivanova M.I. (2020) emphasize that currently a fragmented risk management system is most commonly used, which does not ensure prompt tracking and timely prevention or minimizing risk. As a way out, the authors recommend that companies implement compliance management systems (CMS) and propose the Roadmap to the formation and implementation of compliance management systems. Mordan Ye.Yu., Bukhtiarova A.G., Kravchenko Ya.I. (2021) focused on the analysis of the risk, posed by the involvement of financial institutions in illegal schemes, through the use of the Basel Anti-Money Laundering Index and proposed an integral index that assesses the level of this risk. Larionova K.L., Donchenko T.V. (2020) focused on the credit risk for financial institutions due to its extremely high level and proposed to more actively address the issue of problem loans by using mechanisms for debt restructuring and writing-off and other ways of credit risk optimization. Similar conclusions were drawn by Khoma I.B., Myrhorodets' Yu.V. (2021). Pleskun I.V. (2019), among the many risks faced by financial institutions, singled out corruption risks and proposed to create a model of customer risk control in the context of implementing a risk-oriented approach. This model involves three successive stages: 1) analysis of the external and internal environment (primary financial monitoring); 2) formation and testing of a customer risk map; 3) implementation of control measures in relation to high risk customers.

It is obvious that despite the significant number of publications, the issue of effective management of financial institutions and risks arising under uncertainty remains relevant.

PAPER OBJECTIVE

The purpose of this study is to examine the features of management of financial institutions and risks arising under conditions of uncertainty. The main objectives of the study are to improve the risk management scheme, compare risk assessment methods and determine the risk appetite.

METHODOLOGY

In the course of the study, general scientific and special methods were used: system-structural analysis and synthesis when building a scheme for financial institutions risk management and determining their risk appetites; grouping for identification of internal and external factors of risk manifestation and classification of credit risks of financial institutions; comparison to define the conditions of application, advantages and disadvantages of risk assessment methods.

RESULTS AND DISCUSSION

As a classic definition of risk, we will consider the definition provided in the Regulations on the Organization of the Risk Management System in Banks and Banking Groups of Ukraine. Risk is the likelihood of loss or additional loss or shortfall in planned income due to the debtor's / counterparty's failure to fulfill their obligations under the terms of a contract. (Polozhennia pro orhanizatsiiu systemy upravlinnia ryzykamy v bankakh Ukrainy ta bankivs'kykh hrupakh).

We will use the generally accepted identification and division of factors, which contribute to the manifestation of risk, into internal and external factors (Table 1).

Table 1

Internal and external risk factors for financial institutions

External factors	Internal factors
Instability, inconsistency of legislation	Unforeseeable changes in business processes
Unforeseeable actions of state bodies	Natural environmental impact
Instability of economic policy	Financial problems of the financial institution
Unforeseeable changes in domestic and foreign market conditions	Development and implementation of new technologies or methods of labor organization
Unforeseeable actions of competitors, corruption, takeovers	Insufficient, imperfect or untimely business information
Uncertainty of operating conditions	Inefficient performance of marketing department

Source: Own compilation

In turn, the manifestation of internal and external factors affects the formation of such types of risks as credit, market, liquidity, operational, legal and reputational risks. For financial institutions, taking into account credit risk is a priority. The most common classification of credit risk types is shown in Table 2.

The best way to manage risk is to take certain precautions to detect any of its types. We believe that risk management is a measure used to identify, analyze and further respond to the manifestation of a particular risk. It is a continuous process that is a useful tool in the decision-making process. The financial institution's risk management should be carried out at two levels, according to the cause of its occurrence: at the level of each individual credit and at the level of the credit portfolio as a whole. The credit portfolio risk is its assessment in order to prevent it from reaching a concentration that will violate regulatory requirements. It is necessary to conduct regular reviews and measurements of the credit portfolio in compliance with the established limits, adhering to the following principles:

- forecasting situations that may cause loss;
- taking measures to reduce loss;
- formulation of risk management policy and adherence to risk management mechanisms.

Figure 1 shows a common risk management framework for financial institutions. We insist on taking into account reputational risks in addition to those proposed by the NBU.

Table 2

Classification of credit risk of financial institutions

Classification feature	Description
By field of occurrence	Borrower risk Insurance risk Credit product risk Environmental risk for the financial institution
By position	Risk on market positions Portfolio risk
By extent of risk	Macroeconomic risk Risk of the financial institution as a whole Risk of the decision maker
By area of credit use	Risk on consumer credits Risk on industrial credits Risk on investment projects
By level of predictability of the situation	Foreseeable (predictable) risk Unforeseeable (unpredicted) risk
By causes of occurrence	Subjective risk Objective risk Legal risk / Regulatory risk
By the size of possible loss	Admissible risk Critical risk Catastrophic risk
By the term of the credit agreement	Risk under short-term agreements Risk under long-term agreements
By financial compliance	The risk that results in financial losses The risk that results in lost profits The risk that results in financial income
By type of credit operations	Risk in lending Risk in transactions with promissory notes Risk in leasing transactions Letter of credit risk
Risk by exposure	Risk to be managed by the financial institution on their own Risk that insures losses against the insurance company (to a guarantor) Risk pertaining to each financial institution in the system

Source: Own compilation

We will consider risk an economic category, which lies in the plane of implementation of systematic management in financial institutions, and is related to their formation, performance or return to a sustainable state. Reputational risk has stable cause-and-effect relationships with the activities of financial institutions, their motives and behavioral guidelines in the outside world, in particular, in the economic sphere. The source of reputational risk according to Trostyanska K.M. (2014) is not so much specific facts and events related to the organization, as the nature of the information received by individual entities in terms of influencing the formation of subjective perceptions of the organization. Therefore, financial institutions need to pay attention to the information, relating to the institution, as presented in the media and other information resources, since the deterioration of business reputation caused by negative perceptions of customers or counterparties, leads to deteriorating working conditions and emergence of other risks (operational, market or liquidity risks).

We believe that the main component of risk management is the use of today's innovative methods for risk assessment (Table 2).

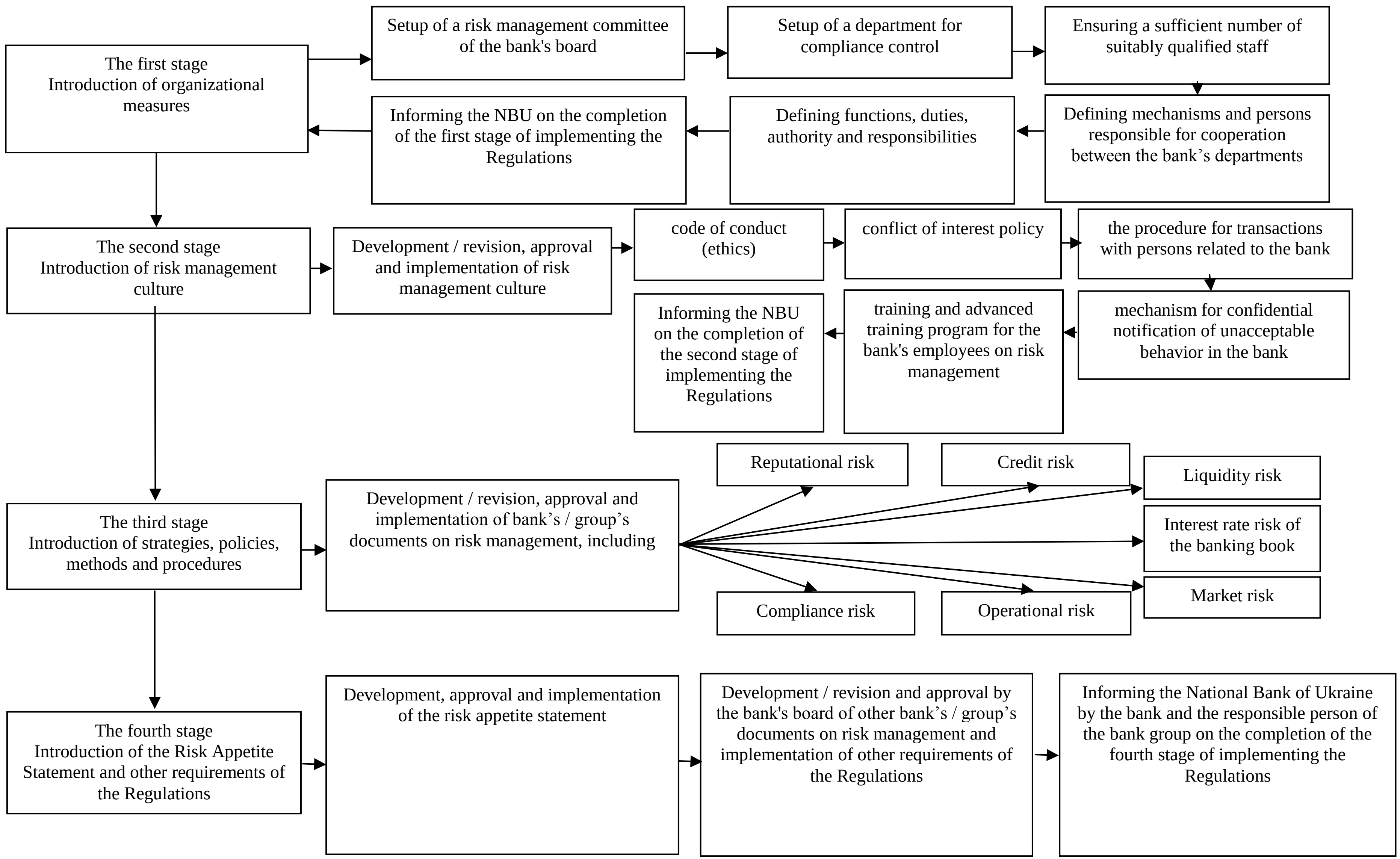

Figure 1. Risk management scheme for financial institutions

Source: PLS results of data processing (Polozhennia pro orhanizatsiiu systemy upravlinnia ryzykamy v bankakh Ukrainy ta bankivs'kykh hrupakh)

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Table 2

Comparison of methods for assessing the risks of financial institutions

Method	***Description***	***Features of use***	***Advantages***	***Disadvantages***
Scoring models	Scoring is a mathematical or statistical model by which a financial institution tries to assess the probability of repayment of a credit by a particular borrower based on credit history	Integral indicators are used for each customer: age, profession, income, length of being a client of the bank, etc.	Using mathematical methods at the preparatory stages, which enables obtaining the best results and taking into account major changes and indicators	The interpretation of the results obtained is done by an expert, so there may be a discrepancy depending on the expert's point of view
Monte Carlo Simulation	Simulation of random processes according to given characteristics	Analyzing various options for a project implementation. Probable characteristics: probable credit interest rate	It allows for taking into account random elements in the model	The need for expert information, the difficulty of building an adequate, consistent model
Decision Trees	Graphical prompting of solutions that may be accepted	Determining risk indicators for the bank's credit portfolio	Possibility of using both categorical and interval variables; metrics that evaluate the model for sustainability	The method is not optimal for problems with a large number of variables, since there is information that cannot be presented in this form.
Rating method	All financial institutions use a certain method to calculate the rating and form an opinion on the borrower's creditworthiness	The use of metrics of the borrower's financial condition	Ease of use, simple mathematical apparatus, clarity of the obtained results without the need for interpretation	The end result is accepted at the discretion of the manager and/or analyst; lack of assessment of its adequacy
Taxonomic analysis	For grouping objects characterized by a significant number of features so that to order the elements of a given set	Assessing risk and profitability of the existing credit portfolio	A significant amount of information is required	It is not a separate independent method, it is necessary to use additional methods to obtain an adequate stable result
Ratio analysis	Expert analysis of the dynamics of economic ratios characterizing the creditworthiness of the borrower by comparing the borrower's indicators with industry averages	Determining the indicators of the borrower's creditworthiness and financial condition	An opportunity to choose a desired approach for analysis; it does not require a significant amount of information	Since it is an expert method, different interpretations of the results are possible; a limited choice of criteria for analysis
Stress testing	Allows the change in quantitative indicators of risk to be analyzed in dynamics	Determining the credit portfolio risk indicators	Ease of use and construction, as all the necessary information is provided by the customer or is publicly available	Indicators are chosen by government agencies and are not always logical and indicative

Source: Compiled by the authors

According to Maliy O.G. (2018), when assessing risks, the financial institution needs to take into account all available information about the debtor, including information on abuse and fraud; the reputation of the debtor; quality of management; the debtor's relationship with other banks, as well as the debtor's credit history. The main source of information on borrowers for financial institutions is the bank's internal credit history and information obtained from the Bureau of Credit Histories for the time of application. To build a scoring model, it is recommended to use variables such as the number of existing customer's accounts for that moment of time, the presence and number of credit cards, rating from the Bureau of Credit Histories, the total amount of all credits, the date of obtaining the last credit, the use of any other credit products or offers from that particular financial institution, the balance sheet and current account information.

Pavlyuk S.M. (2012) argues that the risk management in a financial institution should be carried out through special measures, which include, first, the use of a risk rating system; second, setting the amount of the reserve depending on the risk; third, monitoring of credit portfolio; and, fourth, control of concentrations by borrowers, geographical locations, economic sectors and types of crediting.

Constructing, using, calibrating and interpreting the results obtained during the risk assessment need to be entrusted to a risk committee, the main task of which is to monitor, identify and manage the risks that arise during the operation of the financial institution. The risk committee is also responsible for assessing propensity for risk or risk appetite. Risk appetite is the predetermined levels and types of risks that financial institutions are willing to accept in order to achieve their goals, based on the institution's scope and objectives within the frames of their strategy and business plan. Risk appetite ought to reflect an acceptable level of risk that affects the achievement of specific strategic goals. Therefore, risk appetite should be formed based on the activities that the financial institution considers to be strategically important. Risk appetite needs to be approved by the board of directors and defined in stages, as shown in Figure 2.

We believe that a significant barrier to the effective management of financial institutions and possibility of a qualitative and adequate risk assessment is the absence of a single complete Bureau of Credit Histories in Ukraine, which could assist in obtaining the collected up-to-date information on the customers and their credits. On the contrary, many European countries have the Bureaus established at the state level, so that each financial institution has the opportunity to update and use the relevant information to make a decision on crediting a potential customer. This fact increases uncertainty and the likelihood of unforeseeable loss, therefore financial institutions need to provide mechanisms to compensate and avoid risk. Given the need to ensure the security of the bank, it is recommended to follow strict measures in the crediting strategy together with ensuring high quality of service. To measure the level of quality, the following criteria are proposed to use: credit accessibility; time required by the financial institution to process an individual request for credit; cost of credit.

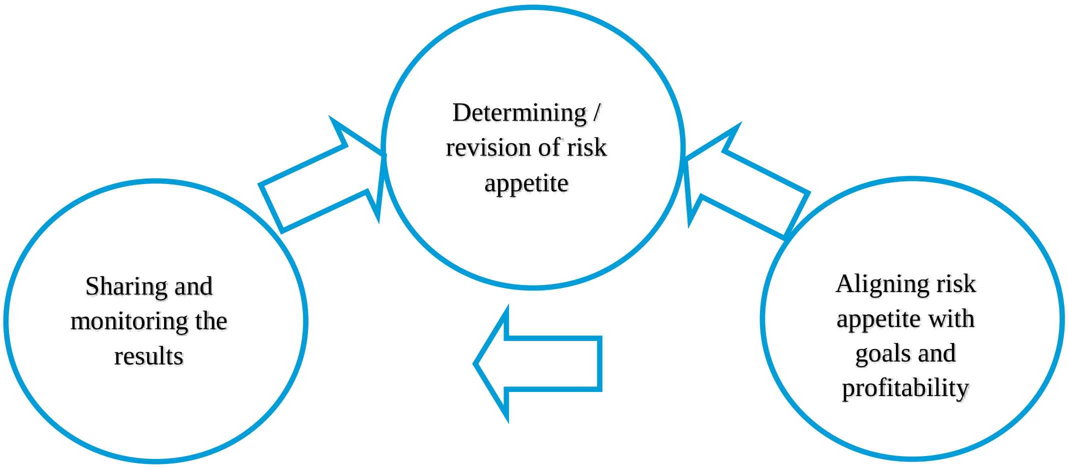

Figure 2 Stages of determining risk appetite

Source: Compiled by the authors

Thus, risk management under conditions of uncertainty becomes a key part of strategic planning for the development of financial institutions in close cooperation with top management, taking into account best practices in analytics and impartial decision-making. The prospect for further research is the formation of approaches that will allow managing several types of risks in compliance with all regulations under current legislation. This will make it possible to fully satisfy customers, while the setup of a single bureau of credit histories will minimize risk manifestations. The risk management function needs to become more differentiated to ensure the competitive advantage of financial institutions in the future. Effective risk management should lead to large-scale ambitious transformations of financial institutions, which is becoming a major task today.

CONCLUSIONS

The article discusses the features of managing financial institutions under conditions of uncertainty. Risk management is a measure used to identify, analyze and respond to a specific risk. It is a continuous process that is a useful tool for decision-makers. Risk management in financial institutions should be carried out at two levels, according to the causes of its occurrence: at the level of each individual credit and at the level of the credit portfolio as a whole. The generally accepted risk management framework for financial institutions proposed by the NBU should also take into account reputational risks that have strong causal links with the activities of the financial institution, its motives and behavior guidelines in life, including the economic sphere. We believe that the main component of risk management is the use of up-to-date innovative methods of risk assessment. Constructing, using, calibrating and interpreting the results obtained during the risk assessment need to be entrusted to a risk committee, the main task of which is to monitor, identify and manage the risks that arise during the operation of the financial institution. We consider the absence of a single complete Bureau of Credit Histories in Ukraine to be a significant barrier to the effective management of financial institutions. The prospect for further research is the formation of approaches that will ensure managing several types of risks in compliance with all regulations under current legislation. This will make it possible to fully satisfy customers, while the setup of a single bureau of credit histories will minimize risk manifestations.

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УПРАВЛІННЯ ФІНАНСОВИМИ УСТАНОВАМИ ТА РИЗИКАМИ В УМОВАХ НЕВИЗНАЧЕНОСТІ

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Метою даного дослідження є з'ясування особливостей управління фінансовими установами та ризиками в умовах невизначеності. Сучасний період розвитку фінансової сфери характеризується наявністю значної кількості підходів та методів управління шляхом прогнозування та оцінювання ризиків, їх виявлення та мінімізації. Аналіз останніх досліджень і публікацій показав, що застосування інноваційно-математичних методів управління дозволяє мінімізувати ризики та забезпечити значні конкурентні переваги у майбутньому. **Методологія**: в процесі дослідження були використані загальнонаукові та спеціальні методи системно-структурного аналізу і синтезу, групування та порівняння. Проаналізовано та доповнено схему управління ризиками, що запропонована НБУ до використання фінансовими установами, шляхом врахування репутаційних ризиків. **Результати** дослідження показують, що наявні методи ґрунтуються на використанні експертних оцінок та потребують значної кількості інформації, яка не завжди є доступною. Доведено, що побудовою, використанням, калібруванням і інтерпретацією результатів, що отримані під час оцінювання ризиків, має займатися ризик-комітет, головною

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задачею, якого є моніторинг, виявлення та управління ризиками, які виникають під час функціонування фінансової установи. Виявлено, що в Україні відсутнє єдине повне Бюро кредитних історій, що є значною перепоною для ефективного управління фінансовими установами. Перспективою подальших досліджень є формування підходів, які дозволять керувати декількома типами ризиків, враховуючи усі нормативні акти при дотриманні чинного законодавства. Це дозволить всебічно задовільнити клієнтів, а утворення єдиного кредитного бюро кредитних історій – мінімізувати прояви ризику.

Ключові слова: управління, фінансові установи, невизначеність, кредитні ризики, методи оцінювання ризиків.