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AN EMPIRICAL STUDY OF THE RISK ASSESSMENT OF ECONOMIC SECURITY OF THE BANK OF UZBEKISTAN

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Abstract

It is necessary to study methods of assessing the risk of economic security based on increasing the level of financial stability of the bank. The purpose of the article is to solve the scientific problem of improving the methodological apparatus in the field of assessing the risk of economic security of banks in Uzbekistan. Methods and techniques of probability theory and mathematical statistics, as well as econometric modeling are used in the development of this problem. The article examines the probability of an event that the calculations of a complex model for assessing the risk of economic security, which is characterized by high accuracy, a long horizon of forecasting and, at the same time, allows you to take into account the specifics of the bank's activities. Along with other criteria, the factors of the developed model for the first time include a criterion characterizing the bank's loan portfolio. Conclusions: In recent years, the bank's economic security risk assessment in Uzbekistan has shown an upward trend, which is evidenced by methodological recommendations on the use of a comprehensive model for assessing the bank's economic security risk in order to monitor the risk of economic security and reduce it by affecting the indicators of the proposed model, and according to the results of the study, appropriate forward-looking recommendations and proposals have been prepared for decision makers, it is necessary to take into account the adjustment of the bank's banking services. Improvements: This study attempts to create a system of indicators to assess the risk of economic security of the bank. In addition, an empirical study of the risk assessment of the economic security of the bank and the banking services sector is being conducted. Based on empirical research, proposals are put forward from the point of view of the existing form of banking services and the use of information technology in order to determine the risk of economic security of the bank and optimize the structure of banking services.

Keywords: *probability of a crisis situation, crisis process, risk forecasting, economic security, financial stability, logistic models, economic instability*

Introduction

The negative consequences of the global economic crisis have caused the onset of a period that some economists call the "era of global uncertainty", characterized by a sharp increase in the number of instability of banks against the background of slowing economic growth, which, in turn, is accompanied by a decline in world trade, industrial production, oil price instability, a reduction in the volume of banking markets, as well as panic in stock and commodity markets.

In recent years, there has been an increase in the number of banks and, as a result, increased competition in almost any segment. This leads to the fact that banks become more sensitive to changes in market conditions. In order to remain competitive in the banking services market, banks need to improve their efficiency. Interest in this topic is justified, since any bank may face the problem of unstable financial condition, insolvency, bankruptcy. The continuity of financial activity consists in the stable operation of banks in the future, as well as the prevention of adverse situations for the financial condition in the current period. It confirms the almost global scale of the crisis processes taking place in the banking system, the inevitability of recession and economic downturn, the curtailment of investment activity, as well as serious social losses that can affect many countries in the world. Financial assessment of the risk of economic security of banks allows you to predict the likelihood of a crisis situation, as well as banks to take the necessary business decisions in a timely manner to eliminate it (Abdullaev A. Y. @ Abdullaev G. A., 2021).

The global financial crisis has shown that even the best international banks must constantly monitor their financial situation and analyze financial stability. The processes of globalization of the world economy only increase the uncertainty and complexity of relations between counterparties regarding their financial independence. The negative consequences of the global financial crisis have caused the onset of a period that some economists call the era of global uncertainty and instability, and the characteristic features of which are a sharp increase in the number of unstable banks.

Massive economic instability of banks can cause serious negative social consequences that directly affect the country's economy. The serious social consequences of instability can be attributed to the growth of structural unemployment due to the loss of jobs during the liquidation or reorganization of banks due to inefficient business. In addition, the growth of unemployment entails such economic consequences as the loss of GDP, a decrease in the receipt of tax deductions to budgets. Often in such circumstances, the tax burden falls on other banks, as well as on the population.

Since the degree of Uzbekistan's active participation in the processes of globalization and economic integration has sharply increased, the global economic crisis has a negative impact on the processes taking place inside the country, which greatly complicates the work of the financial services of domestic banks in the direction of monitoring the risk of economic security. At the same time, a flexible financial management system at the bank should promptly respond to any changes occurring in its activities, which is especially important in conditions of economic instability and is practically impossible without the use of methods for assessing the risk of economic security with high accuracy and a long forecasting horizon. At the same time, the specific conditions of the Uzbek economy call into question the expediency of using a number of methods for assessing the risk of economic security developed by both Uzbek and foreign scientists, which necessitates research in this area (Abdullaev A. Y. @ Abdullaev G. A., 2021).

After the transition to the market path of development, the economy of Uzbekistan has repeatedly experienced economic crises and their consequences, such as a decline in production, recession, tightening of monetary relations. The economic instability imposed on Uzbekistan may lead to the fact that banks of various organizational and legal forms will find themselves in a difficult economic situation. However, this is due not only to the general situation in the country, but also to the weakness of financial management in banks. Thus, knowledge of methods of assessing the risk of economic security, approaches to the analysis of financial activity and the ability to develop a plan for the recovery of banks has become necessary for effective management.

The expediency of conducting further research in the field of economic security risk

also determines the fact that existing methods involve the analysis of a limited range of indicators characterizing the liquidity, solvency and efficiency of banks. At the same time, the range of factors contributing to the risk of economic security of banks in Uzbekistan has significantly expanded due to the processes of economic integration and a number of other external reasons, which indicates the need to improve the methods of its assessment by introducing additional indicators into the monitoring process.

In addition, as the analysis of scientific research in the field of financial management shows, to date, a detailed classification of methods for assessing economic security risk has not been developed, which would allow the bank's financial services to form an objective idea of the tools they can operate with in order to monitor the risk of economic security. The generally accepted classification is rather narrow, is too generalized and does not allow the bank to choose the method of assessing the risk of economic security that best corresponds to the specifics of its activities.

The assessment of the risk of economic security of banks is of interest not only for shareholders, creditors, public authorities and others in choosing the most economically stable and promising business partners, but also for the banks themselves, since during the measures taken to overcome the crisis situation allow banks to continue their activities and restore financial performance. In this case, risk managers need to apply a methodology for assessing the risk of economic security of the bank, with the help of which it is possible to determine and predict the probability of the onset of economic instability of the analyzed bank. Otherwise, economic instability will negatively affect the country's economy as a whole.

Therefore, in the scientific circles of Uzbekistan and abroad, an active search for the optimal model of financial control of the bank continues. This is required by the strengthening of competition in the banking sector and the aggravation of trends to reduce the degree of risk to the economic security of banks. During the existence of the modern banking system in Uzbekistan, more than 10 licenses were revoked from commercial banks, and in the USA in the 80–90s of the XX century, about 1,500 banking institutions or more than 10% of their total number went bankrupt. Along with the improvement of state regulation of the banking sector, currently carried out by the Central Bank in order to increase the stability of the banking system, there is a development of risk assessment systems for the economic security of banks.

Therefore, in scientific circles Uzbekistan and abroad continue to actively search for the optimal model of financial control of bank. This requires the strengthening of competition in the banking sector and the aggravation of trends to reduce the degree of risk and economic security of banks. During the existence of the modern banking system in Uzbekistan, more than 10 licenses were revoked from commercial banks, and in the United States in the 80–90s of the XX century, about 1,500 banking institutions or more than 10% of their total number went bankrupt. HAlong with the improvement of state regulation of the banking sector, currently implemented by the Central Bank in order to increase the stability of the banking system, there is a development of systems for assessing the riskaof economic security of banks (Abdullaev A. Y. @ Abdullaev G. A., 2021).

Therefore, the problem of developing an assessment and forecasting of the risk of economic security of banks is one of the relevant areas of research of the banking sector of the economy. The relevance of the chosen topic of work is due to the high practical significance of the problem of timely risk of economic security from the point of view of stabilizing the economic situation in Uzbekistan; insufficient development of the theoretical base and methodological apparatus in the field of analysis and assessment of the risk of economic security of Uzbek banks; lack of comprehensive research in this area.

Literature Review

An analysis of the scientific literature devoted to the problems of assessing the risk of economic security of banks has shown that this area is of considerable interest for both Uzbek and foreign economists. At the same time, to date, the area of assessing the risk of economic security of Uzbek banks is insufficiently studied, due to the high degree of variability of the environment in which they operate.

At the same time, in the conditions of unpredictability of the processes taking place in the economy of Uzbekistan, along with scientific literature in the field of financial management, macroeconomic research is also becoming essential for improving the methodological apparatus in the field of economic security risk assessment.

Among foreign scientists whose scientific works in the field of assessing the risk of economic instability are of high theoretical and practical importance, it should be noted, first of all, Altman E., Begley J., Beaver W., Ming J., Minussi J., Supramainen D., Ohlson J., Watts S., Warsinkton D., etc.

It is worth noting that the models take into account the factors calculated from the initial data contained in the accounting statements; the models of V. I. Barilenko and A. D. Sheremet are advisable to use for the diagnosis of economic instability.

Altman E. He contributed to the construction of models for forecasting the risk of economic instability by applying multiple discriminant analysis for the first time (Altman E., 1968). Olson J. He was at the origin of the application of logistic analysis to assess economic instability (Logit-model) (Ohlson J. A., 1980).

This article provides a detailed analysis of the characteristics of both foreign and domestic models; conclusions are drawn regarding the effectiveness of applying such models to banks.

In Uzbekistan, among the multiplicative discriminant analysis (MDA) models for predicting the risk of economic instability, two-factor Altman models are used, which have many disadvantages, the main of which is the presence of the so-called uncertainty zone in the decision-making ranges. Economic instability, the specifics of tax legislation and regulatory support for accounting, as well as the degree of reliability of economic indicators of banks' activities used in the model, can distort objective estimates. The use of Western models for the economy is also difficult for other reasons. Firstly, because of the inconsistency of the results when using different techniques. Secondly, because of the low predictive accuracy of the models, which significantly decreases when using data for several years to analyze the financial condition. Thirdly, due to the use of data for one year in the models (changes in the dynamics of indicators over several years are not taken into account).

Despite the wide variety of different methods of assessing the risk of economic security presented in both Uzbek and foreign scientific literature, studies on their use in domestic practice are few and have been conducted on the example of one or several banks, which makes the results obtained insufficiently objective. At the same time, scientific papers present the results of the study of the most well-known models for assessing the risk of economic security, while the analysis of the latest methods in this area has not been carried out.

Thus, insufficient scientific and methodological elaboration of the problem of economic security risk analysis, and, as a consequence, the need for further improvement of its assessment methods in conditions of economic instability, determine the significance of this study, and also determined the choice of the topic of work.

The issue of assessing and forecasting the risk of economic security of banks cannot be considered fully studied, and the search for new effective and improved approaches to solving this problem determines the main task of this article.

Research method

The main method of assessing the financial condition of the bank is financial analysis, with the help of which it is possible to objectively assess the internal and external relations of the analyzed object: to characterize its solvency, efficiency and profitability of activities, poor management quality, including weak effectiveness of risk management systems, development prospects, and then, based on its results, make informed business decisions.

The main task of financial analysis is to reduce the inevitable economic uncertainty associated with making future-oriented economic decisions. Therefore, financial analysis, like any other complex process, should have its own technology-a sequence of steps aimed at identifying the causes of the deterioration of the bank's condition and the levers of its optimization.

The initial information base of financial analysis is accounting and reporting data, the analysis of which should determine all the main aspects of financial activities and trans-

actions performed in a generalized form, i.e. with the degree of aggregation necessary for analysis.

To solve specific problems of financial analysis, a number of special systems and methods of analysis are used to obtain a quantitative assessment of the results of financial activity in the context of its individual aspects, both statically and dynamically. The specific procedure for calculating the indicators forming a system of criteria for assessing the degree of satisfaction of the balance sheet structure was established in the Methodological Provisions for assessing the financial condition of the bank and Establishing an Unsatisfactory Balance Sheet Structure.

The need to calculate the key coefficients is obvious, since their values obtained in the framework of financial analysis serve as the basis for the final indicators of predicting the probability of a crisis situation, used both in foreign and domestic models for quantifying the economic security of the bank.

In foreign countries, factor models developed using multidimensional discriminant analysis are widely used to assess the risk of instability.

When considering foreign developments in the field of instability risk assessment, at least two circumstances should be taken into account:

1) in domestic publications, obviously, due to the difficulties of translation, an attempt to "adapt" the models to constantly changing reporting, as well as the ambiguous interpretation of a number of concepts by the authors, different terminology is used and a different order of calculation of some factors taken into account in the models is given;

2) the use of foreign models to predict the instability of the Bank should be done with great caution: these models are based on data banks in those States in which they were created, and not fully suited to assess the risk of instability of the domestic banks in the economy due to the different methods of reflection inflationary factors, different capital structure, and the differences in legislative, database, etc.

Currently, analysts have extensive, although not in all cases perfect tools, forecasting the risks of economic security of banks. It is worth noting that in order to increase the correctness of the assessment of the risks of economic security of the "own" bank, it is advisable to make calculations not according to one, but according to a number of available models and techniques, which is demonstrated in the conducted research on the topic under study.

The need to assess the effectiveness of the application of methods of forecasting the risk of economic security is sufficient today. This is due to the wide variety of models.

As the systematization of modern methods of assessing economic security risks developed by foreign authors has shown, the question of the expediency of their application in the banking practice of financial management remains debatable. To date, quite a large number of studies have been devoted to this issue in relation to the most well-known foreign approaches based on multiplicative discriminant analysis (MDA).

In the course of numerous studies (conducted by both foreign and Uzbek authors) of the Beaver V. and Altman E. models, a number of their significant shortcomings were identified, the main of which is the presence of the so-called uncertainty zone in the decision-making ranges.

To date, the use of a number of models for diagnosing the bank's economic security is impractical in economic conditions for the following reasons. Firstly, the use of different models leads to contradictory results. Secondly, the predictive accuracy of the models is significantly reduced when using data for several years to analyze the financial condition. Thirdly, foreign models do not take into account the specifics of the economic situation in Uzbekistan, which differ, among other things, in accounting systems, which is reflected both in the set of factors-signs and in the weight coefficients for them. Fourth, the models use data for one year, and do not take into account changes in the dynamics over several years. Fifth, existing models use in their analysis a limited range of indicators that determine liquidity, solvency, profitability and, as a rule, are expanded or modified Western models of the 60–80 years. XX century. The range of factors determining the risk of economic security is noticeably larger, which makes it necessary to improve its assessment models by expanding it with additional parameters.

As a result, foreign practices in the field of financial management have almost completely

abandoned the use of models for assessing the risk of economic instability based on discriminant analysis, and more and more attention has been paid to other, more modern econometric tools, and above all the so-called logit – models. In each logit – model, the probability of instability is calculatedcusing the general formula of the logistic function, which has the form

$$Q = 1 : \left(1 + e^{y}\right), \quad (1)$$

where Q – is the probability of instability in fractions of one (takes values from 0 to 1); e – is the base of the natural logarithm (Euler constant equal to 2,71828); y – is the coefficient-an integral indicator calculated depending on the developed model.

Despite the fact that James Ohlson is considered to be the founder of the models under consideration, who first used the logistic regression apparatus in 1980 to predict instability in international practice, D. Chesser was the first to use this formula in 1974, who developed a model specifically for the banking sector to assess the probability of a borrower not fulfilling the terms of a loan agreement. So, in the Chesser model, the mathematical algorithm of the model is the calculation of a certain integral indicator y based on six weighted variables, which are financial coefficients that characterize the profitability, liquidity and financial stability of the company (Chesser D. L., 1974).

The ratio of the numerical result of the final probability of instability to the qualitative characteristic is performed based on the following intervals: if the final value is $P < 0,5$, then the probability of instability may be low; if $P > 0,5$, then, respectively, high. However, it is worth repeating once again that in these models, the levels of determining probability intervals (in other words, the cut – off threshold $P = 0,5$) relative to possible instability are generally given to the subjective discretion of the expert analyst.

Despite the positive factors of using logistic regression and logit – models based on it to assess the risk of economic security of the bank, these models can also be subjected to constructive criticism. For example, a detailed analysis of the assessment of the probability of economic security of domestic banks, obtained on the basis of these models, does not allow us to draw an unambiguous conclusion about the probability of economic security of the bank included in the analyzed sample: calculations do not give accurate, often even the opposite results.

As the general main reasons for the low efficiency of the use of foreign logit – models for assessing the risk of economic security on the example of banks, the following can be distinguished:

– differences in the source data used to build models. Thus, the models presented above were built on the basis of a sample of foreign banking institutions with regulatory parameters of the balance sheet structure and performance, different from the Uzbek ones;
– differences in the macroeconomic situation. The coefficients of the models for countries with developed market economies are not applicable for countries with economies in transition and vice versa.

In addition, it is important to note separately that these models do not take into account the specifics of the activities of banking institutions. So, the models presented above were originally developed as universal, i.e. applicable for banking institutions. As numerous studies in the field of financial management show, the optimal values of key indicators of financial condition vary significantly for banking institutions.

However, many economists agree that since logit – models for assessing the risk of economic security of companies have shown high efficiency in the countries where they were developed, it can be assumed that using the same mathematical apparatus based on a sample of banking institutions and a system of indicators built according to financial reporting standards can lead to the construction of a fairly accurate model for predicting the risk of economic security of a bank, which will initially be developed taking into account the specific features of banking institutions.

This problem is connected with the need to develop and test a comprehensive model for assessing the risk of economic security of the bank in order to improve the methodological apparatus in this area.

As part of the improvement of the procedure for assessing the risk of economic secu-

rity for Uzbek banks, taking into account their specifics, taking into account domestic and foreign experience in this field, taking into account the results of research conducted in the process of solving problems, a comprehensive model for assessing the risk of economic security was developed and tested.

In accordance with the classification of methods for assessing the risk of economic security of the bank, proposed in the framework of solving problems, the developed comprehensive model for assessing the risk of economic security belongs to the following groups: depending on the scope of application (universal); depending on the geography of origin (developed in a country with a transition economy); depending on the possibility of remote analysis (remote); depending on the forecast horizon (long-term); depending on the scale of the bank's activities (universal); depending on the sector affiliation of the bank (universal); depending on the degree of formalization (since it takes into account quantitative and qualitative characteristics); depending on the complexity of calculations (does not require special software).

The developed model assumes the calculation of a complex indicator of economic security risk based on a 12-factor logistic regression of the following type:

$$O^{RE} = e^{y} : \left(1 + e^{y}\right), \quad (2)$$

$$y = a_0 + a_1 x_1 + a_2 x_2 + a_3 ln\left(x_3\right) + a_4 ln\left(x_4\right) + \\ + a_5 ln\left(x_5\right) + a_6 ln\left(x_6\right) + a_7 x_7 + a_8 x_8 + a_9 x_9 + \\ + a_{10} x_{10} + a_{11} x_{11} + a_{12} x_{12}, \quad (3)$$

where O^{RE} – a comprehensive criterion for the risk assessment of economic security in fractions of unit (accepts values from 0 to 1); e – is the base of the natural logarithm (the Euler's constant, equal to the value 2,71828); y – factor of the integral indicator calculated depending on the developed model; x_1 – factor, characterizing the "age" of the Bank, takes the value0, if the Bank was established more than 20 years ago, and the value1 if less than 20 years; x_2 – factor characterizing the credit of portfelyu activities of the Bank. In case if the credit portfolio of the Bank ispositive, the factor takes the value 0, otherwise, it is assigned the value 1; $\ln(x_3)$ – the natural logarithm of the volume and the credits granted by the Bank; $\ln(x_4)$ – the natural logarithm of the amount and the allowance for possible loan losses; $\ln(x_5)$ – the natural logarithm of the equity capital of the Bank; $\ln(x_6)$ – the natural logarithm of the interest oh and interest-free oh the expenses of the Bank; x_7 – current liquidity ratio of the Bank; x_8 – the refinancing rate of the Central Bank; x_9 – return on assets of the Bank (net income/assets); x_{10} – the return on equity of the Bank (net profit/equity); x_{11} – the rate of growth of Bank assets; x_{12} – the rate of increase of own capital of the Bank.

Analysis of results

The proposed model includes factors that characterize the bank's activities from various sides, which allows for a comprehensive risk assessment of its risk to the bank's economic security. At the same time, it should be emphasized that the current methods of economic security risk allow us to take into account only some of these factors and none of them in aggregate. Therefore, the model proposed in this paper for assessing the risk of economic security of the bank has been called complex.

Moreover, the proposed model for the first time takes into account the factor characterizing the bank's loan portfolio: previously, this factor was not taken into account by both Uzbek and foreign economists during the development of methods for assessing the risk of economic security. The analysis of the bank's loan portfolios within the framework of using the model will allow to assess the risk of economic security not only from the point of view of the forecast of the bank's activities in the foreseeable future, but also, which is very important, to take into account the solvency of the analyzed bank in the past.

The key principle of the implementation of the proposed integrated economic security risk assessment model is the calculation of the integrated economic security risk assessment criterion O^{RE} based on model (2), comparison of which with threshold values allows us to conclude that there is a possibility of economic security risk in the period from one to two years from the date of calculations.

The approach to the construction of the model implemented in the work allowed, on the one hand, to construct a universal model for assessing the risk of economic security, and

on the other hand, to take into account an important drawback identified during the study of Uzbek and foreign methods, according to which these methods do not take into account significant differences in the normative values of the bank's performance indicators with different sectors. The parameters of the complex model depending on the banking sectors are presented in Table 1.

It should be noted that logit – models of economic security risk assessment, presented exclusively in foreign scientific literature, do not offer any decision-making ranges: the conclusion about the probability of economic security risk is made on the basis of an expert opinion, depending on the "proximity" of the calculated value of the final indicator to «0» (minimum risk) or to «1» (maximum risk). The complex model presented in this paper assumes 5 zones of total risk (Table 2) with a "step" of 30%, which makes it possible to classify a bank in one or another category of economic security risk.

Table 1. *The value of the coefficients of the integrated logit – model for assessing the risk of economic security of banks*

Coefficient	Factor Model Factor	The name of the banking sector		
		Joint stock company	Joint stock commercial Bank	Private joint stock commercial Bank
a_0	*const*	43.0479	47.6467	35.4361
a_1	x_1	6.3257	5.9475	0.3768
a_2	x_2	12.4269	10.1925	8.6738
a_3	x_3	–1.8318	–1.5851	–0.8567
a_4	x_4	–3.8349	–3.9987	–4.0976
a_5	x_5	–1.5743	–1.5316	–0.6219
a_6	x_6	–3.1721	–3.9798	–2.9862
a_7	x_7	–0.8023	–0.6913	–1.3698
a_8	x_8	–8.4776	–5.0894	–6.3609
a_9	x_9	–10.8005	–15.3882	–0.2833
a_{10}	x_{10}	– 10.2873	–11.07231	–7.4123
a_{11}	x_{11}	–22.5714	–22.0183	–3.1976
a_{12}	x_{12}	8.2571	8.4374	3.8315

At the same time, the author emphasizes that it is advisable to calculate the final indicator in accordance with the proposed model with a certain frequency and analyze its dynamics, which will allow the financial manager to determine in which direction the development of banks is moving and take timely measures to prevent the risk of economic security.

Table 2. *Decision-making ranges in accordance with the integrated logit – model for assessing the economic security risk of banks*

The value of the complex criterion O^{RE}	Characteristic of the economic security risk of banks
$0,9 < O^{RE} < 1$	Maximum economic security risk
$0,7 < O^{RE} \leq 0,9$	High economic security risk

The value of the complex criterion O^{RE}	Characteristic of the economic security risk of banks
$0,5 < O^{RE} \leq 0,7$	Average economic security risk
$0,3 < O^{RE} \leq 0,5$	Low economic security risk
$0 < O^{RE} \leq 0,3$	Minimal risk of economic security

Assessing the positive aspects of this logit – model, it is worth noting that this model is really complex, as it contains a number of key factors characterizing the activities of banks from various sides, including the macroeconomic situation in the country, the sector specifics of banks, the dynamics of the scale of its activities. In addition, it was originally developed for domestic banks and allows them to take into account their quality indicators and the specifics of their activities, as well as the macroeconomic situation in the country. Moreover, the author separately notes that this model for the first time takes into account the factor characterizing the credit portfolio of banks, which was not previously taken into account in either Uzbek or foreign models. According to the author, the inclusion of this factor in the model will make it possible to assess the risk of economic security not only from the point of view of the forecast of the activity of the analyzed banks in the foreseeable future, but also, which is very important, to take into account its solvency in the past. At the same time, it is worth noting some difficulty in obtaining data of this kind regarding a particular bank.

A number of controversial issues accompanying the model should also be highlighted. Questions arise about the number of parameters for calculating y indicators. Their number of 12 makes the model quite cumbersome. In world practice, the optimal number of indicators used is 2–5. In addition, little attention is paid to the algorithm for selecting these final parameters. There are questions of their origin and the expediency of their use for comprehensive characterization. The factor of using the age of banks and its cut-off threshold, equal only to the binary value > or < 20 years, is also not sufficiently justified. In addition, both indicators of profitability, as well as both indicators of growth rates that are simultaneously present in the model, are similar to each other. Despite the disadvantages inherent in individual logit models, in general, we can conclude the following:

1. The application of discriminant analysis to the study of factors affecting the probability of economic security is not always permissible. It is necessary to pay attention to the rather rigid prerequisites underlying its application. In many cases, these prerequisites are not fulfilled and this situation is not unique. If we analyze only the variance of the same cash flow, then a financially prosperous bank is more likely to have more stable indicators than one that is in a very unstable state.
2. The approach based on the use of logit – models is more universal in this regard and has the advantage that, compared with discriminant analysis, it has much less stringent restrictions, and therefore it has a wider scope of application.
3. Choosing between using linear and nonlinear models in order to predict the risk of economic security, it is still recommended to give preference to the latter. When analyzing errors of the first and second kind and when cross-checking, they proved to be the best.

The possibility of developing ways to reduce the risk of economic security by influencing the factors included in the model is one of the most important advantages of the proposed integrated model (along with high accuracy and a long forecasting horizon). Directions of reducing the risk of economic security are influenced by the following factors:

1. Maintaining a positive loan portfolio.
2. Effective liquidity management.
3. Optimization of the structure of funding sources.
4. Effective increase of own capital.
5. Improving the efficiency of the bank.
6. Increase in the growth rate of the bank's assets.

A number of studies can serve as a result of the above, which have shown that in practice logistics models allow to obtain significantly more effective assessments of economic security risk than statistical discriminant analysis can theoretically provide. At the same time, it should be emphasized that in practice these models have found special applications that were solvable using discriminant analysis methods.

The result of the study was the identification of signs of economic security, despite the improvement in the dynamics of the balance sheet and the report on financial results. So, out of ten models selected for testing, eight gave a result. This is due to the fact that different coefficients were used in different models for calculation, and also during the study within the framework of logit models, the credit portfolio of banks, its features, as well as external economic factors that do not directly depend on banks, but characterize the macroeconomic situation of the country as a whole, for example, the GDP deflator index, the refinancing rate of the Central Bank were taken into account.

We believe that such studies can be carried out in banks with any type of activity, since the models considered have similar limitations. It is worth noting that when conducting an analysis of financial stability and economic security risk, it is necessary to take into account the peculiarities of the bank, since this directly affects the balance sheet structure. Therefore, when comparing the calculated values of the coefficients with the "norm", it is necessary to interpret the result correctly.

Conclusion (discussion)

Analyzing all the considered methods of assessing the risk of economic security, it is impossible to give an unambiguous conclusion that the bank will be exposed to economic security, since not all calculations based on models gave a positive result. Guided by the principle of caution, it is worth noting that the bank is in a zone of uncertainty and, accordingly, financial risks. This bank does not fully have advantages over other market participants in attracting investments, providing loans, and working with personnel. The lower the financial stability of the bank, the less it is able to adapt to changing environmental conditions. In this regard, the analysis of economic security risk is of paramount importance for the bank.

In the scientific work, a comprehensive model of economic security risk assessment has been scientifically substantiated and confirmed by calculations, which is characterized by high accuracy, a long forecasting horizon and, at the same time, allows taking into account the specifics of the Bank of Uzbekistan's activities. Along with other criteria, the factors of the developed model for the first time include a criterion characterizing the bank's loan portfolio. At the same time, methodological recommendations have been developed on the use of a comprehensive economic security risk assessment model of the Bank of Uzbekistan in order to monitor the risk of economic security and reduce it by affecting the indicators of the proposed model.

The comprehensive methodology of assessing and forecasting the risk of economic security of the bank considered in the article makes it possible to diagnose in advance the possible onset of a crisis situation at the bank and in a timely manner, take measures to prevent it by using various anti-crisis strategies. This is very relevant, since any bank will prefer to avoid any negative judicial procedures in order to preserve its business reputation. Therefore, the prospects for the practical application of the methodology for assessing the risk of economic security today seem to be quite broad.

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