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PECULIARITIES OF ENSURING ECONOMIC BANK SECURITY IN TERMS OF FINANCIAL INSTABILITY

Abstract. The modern global society has undergone significant changes in its development, which determines the importance of safety in all spheres and sectors of society. That why needs to developed the effective economic security of bank management tools. The purpose of the article is to identify the characteristics of financial security of the bank in terms of financial instability. Evaluation of the financial security of the bank using the scoring methodology. Establishing the impact of financial security components on its state using the correlation matrix. Determining on the basis the analysis ways to increase safety and prediction of its state using exponential smoothing.

Implementation of the proposed complex to conserve an adequate level of economic security activities of PJSC "Raiffeisen Bank Aval" and its further increase would allow in the medium term to maintain the stability and the bank's ability to live. After the analysis has been defined the level of financial security as a component of economic and identify methods to improve it for the banking institution. Based on these results it's advisable to predict its possible level for the next year.

Keywords: economic bank security, economic development, the financial component of economic security, correlation matrix, link type, strength of the link.

JEL classification: G 00, G 32, E 58, G 21.

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ОСОБЛИВОСТІ ЗАБЕЗПЕЧЕННЯ ФІНАНСОВОЇ БЕЗПЕКИ БАНКУ В УМОВАХ ФІНАНСОВОЇ НЕСТАБІЛЬНОСТІ

Анотація. Безпека банківської установи є запорукою його стабільної та прибуткової діяльності. Саме тому було досліджено особливості забезпечення фінансової складової економічної безпеки банку в умовах фінансової нестабільності. Проведено кореляційно-регресійний аналіз фінансової складової економічної безпеки банку. На основі аналізу даних виявлено тип та щільність зв'язку між результативним показником та факторами, що на нього впливають. За результатами обґрунтовано заходи з підвищення фінансової безпеки банку. А також зроблено прогноз стану фінансової безпеки установи. Доведено адекватність та ефективність застосування даного методу.

Ключові слова: економічна безпека банку, економічний розвиток, фінансова безпека, кореляційна матриця, тип зв'язку, щільність зв'язку.

Формул: 1; рис.: 2, табл.: 3, бібл.: 10

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ОСОБЕННОСТИ ОБЕСПЕЧЕНИЯ ФИНАНСОВОЙ БЕЗОПАСНОСТИ БАНКА В УСЛОВИЯХ ФИНАНСОВОЙ НЕСТАБИЛЬНОСТИ

Аннотация. Безопасность банковского учреждения является залогом его стабильной и прибыльной деятельности. Именно поэтому были исследованы особенности обеспечения финансовой составляющей экономической безопасности банка в условиях финансовой нестабильности. Проведен корреляционно-регрессионный анализ финансовой составляющей экономической безопасности банка. На основе анализа данных выявлен тип и плотность связи между результативным показателем и факторами, что на него влияют. По результатам обоснованы меры по повышению финансовой безопасности банка. А также сделан прогноз состояния финансовой безопасности учреждения. Доказана адекватность и эффективность применения данного метода.

Ключевые слова: экономическая безопасность банка, экономическое развитие, финансовая безопасность, корреляционная матрица, тип связи, плотность связи.

Формул: 1; рис.: 2, табл.: 3, библи.: 10

Introduction. The modern global society has undergone significant changes in its development, which determines the importance of safety in all spheres and sectors of society. Reached such a level where further improvement is carried out in conditions increasing uncertainty and unpredictability. Under such conditions, any actions directed at achieving promising results have a high risk.

The effective economic security of bank management tools needs to be developed. This is due to the unpredictability and aggressiveness of the environment. On the one hand, a need to an economic study of safety management systems is

determined by dynamic changes in the environment. On the other - the efficient use of resources. Construction of the complex economic and mathematical model evaluation, analysis and forecasting are an actual problem. That requires different approaches and solutions methods.

Analysis of the research and statement of the problem. Issues of assess the economic security of banking institutions researched Kolodizev O.M. and Shtaer O.M. [1], Gubarev I.O. [2], Demus L.R. [3], Moiseenko I.P. and Martynyuk O.A. [4], Vlasyuk O. [5]. Western economists W. Allen and G. Wood [6] and the Belarusian researcher Brishtev A. [7]. But it requires further study the problem of determining the impact strength of individual indicators on the result in order to develop an effective system of ensuring the bank economic security.

The purpose of the article is to identify the characteristics of financial security of the bank in terms of financial instability. Evaluation of the financial security of the bank using the scoring methodology. Establishing the impact of financial security components on its state using the correlation matrix. Determining on the basis the analysis ways to increase safety and prediction of its state using exponential smoothing.

Research results. The development of the financial market, the complexity of its infrastructure, growing competition caused by the increase in the number of traditional and non-traditional financial intermediaries, reinforces the need for domestic banks compete for each potential customer. Now keep existing consumers of financial services is only possible ensuring them the financial security of their assets from the negative impact of factors external and internal environment of the bank's functioning. Therefore, modern banks should make great efforts to develop comprehensive and effective its own economic security systems.

The economic security the banking institution is a complex system, which can only be provided after the interaction of all the elements. So, allocate financial, informational, technical and technological, intellectual and human resources, power, legal, political and juridical, market, and organizational components. The financial component of economic security is the most influential and essential to its ensuring. As is the protection of the financial interests of the bank, its financial sustainability and the environment in which it functions. Therefore, to study the economic security of the bank shall analyse financial component.

As the financial component of economic security of the banking activities is to be understood set of measures to achieve the highest possible solvency and stability of the commercial bank, the liquidity of its balance sheet, effective capital structure and the most profitable areas of its investments [5].

Described in research [6] the methods for analysing of economic parameters reflect the stability of the financial condition of the business entity in the long term. This takes into account changes in the conditions of internal and external environment and the extent of the bank's financial independence. Such estimates include only the ability to withstand the negative effects of the external and internal environment. They do not provide for the identification and the neutralization of threats.

Thus, most of the existing safety level measurement techniques using traditional parameters determining the level of economic condition of on the basis methods of economic and financial analysis. To assess the level of financial economic security of the bank using the scoring methodology [5]. It provides a calculation of the number of points generated on the basis of the assessment of financial ratios and indicators.

Its feature is to eliminate the disadvantages of quantitative methods. Namely, the rigid adherence to the normative values of indicators and insufficient consideration of the indicators changes dynamics. To levelling the disadvantages introduced the concept of "grey zones" with the mathematical accuracy of +/- 10% of the standard value.

Also, to investigate the relationship between the bank's financial security and the factors that affect it, it is advisable to apply the correlation matrix. Its major task - analysis of available statistical data with followed determination of density correlation between the investigated traits.

Accordingly, the correlation matrix has been generated based on the assessment the bank's financial component of economic security. This was done by grouping the results of coefficients' analysis and the total points the financial component of economic security for each period.

To carry out this analysis was chosen PJSC "Raiffeisen Bank Aval". As a result of the analysis was assess each of the indicators the scoring methodology and defined "grey zone" each of them. The correlation matrix was formed after receiving the results of this methodology. According to received results set has been received the opportunity to form a range of consulting activities to improve the financial level of security the bank.

Calculation of the scoring methods and the correlation matrix has been previously carried out in [7]. Therefore, for further analysis of this issue, we rely on the results obtained in this paper.

The direct and inverse relation between the resulting criterion and the factors that affect it as a result of the analysis of the correlation matrix were found. Accordingly taking into account density of the resulting links, it was formed a set of recommendations aimed at enhancing the economic security the bank.

Implementation of the proposed complex to conserve an adequate level of economic security activities of PJSC "Raiffeisen Bank Aval" and its further increase would allow in the medium term to maintain the stability and the bank's ability to live. As a result, provided:

- Achievement of the bank's target (profit);
- Implementation of main interests (raising its rating on the banking services market);
- Protection against internal and external destabilizing factors independently operating conditions (the provision of safe activity of the bank in the future).

Carrying out the proposed activities require intensified forces of the banking institution. As well as effective election necessary tools and security technologies at all levels of the bank's security system.

After the analysis has been defined the level of financial security as a component of economic and identify methods to improve it for the banking institution. Based on these results it's advisable to predict its possible level for the next year. For this, we use a model of exponential smoothing. To accomplish this forecast for the basic data necessary to take the results obtained, i.e. the total number of points for the financial safety level by the scoring method [7].

Table 1

The total sum of points for the financial security by the scoring methodology of PJSC "Raiffeisen Bank Aval" in 2011 - 2014 years

Indicator	The resulting scores			
	2011 year	2012 year	2013 year	2014 year
Total sum of points	107,50	110,00	123,00	73,00

Source: authorial calculation

Construction of the model based on exponential smoothing – this is the best version of the predictive model when the data is for several periods (months, days, weeks, quarters) and it is not clear, there is a tendency to growth or recession. The forecast is calculated using the following formula:

$$Y_{t+1}^* = \alpha \cdot Y_t + (1 - \alpha) \cdot Y_t^* \tag{1}$$

- Y_{t+1}^* – forecast for the next period t+1;
- Y_t – data for the forecast in the current period t;
- α – smoothing coefficient of row (α is set by manually and is in the range of 0 to 1);
- Y_t^* – the forecast value in the current period, and in the first period $Y_1^* = Y_1$, i.e. Y_1^* equal to values in this period.

It is important to note that this model assumes regular recalculation the forecast at the end of the last period and the emergence new data for the forecast during the last period. The greater the value, the greater the influence of the latter periods on the forecast.

To calculate the accuracy of the forecast for a given value, it is necessary to determine:

- 1) error the model. To do this, for each period of observation of the actual values subtract values forecast for this period;
- 2) standard deviation. To do this, for each period to calculate the ratio of the square error of the model to the square of the forecast for that period;
- 3) standard quadratic deviation. It is calculated as the average standard deviation for the entire period analysed;
- 4) the accuracy of the forecast = 1 – mean square deviation.

To estimate the optimal value of α calculated forecasts sequentially with α equal from 0.1 to 0.9, and the value α is selected of the forecast accuracy, which is closest to 100%.

Table 2

The data total financial security points from the year 2011-2014

		Exponential model 1			Exponential model 2			
		alpha =	accuracy	0,86	alpha =	accuracy	0,79	
			0,8			0,2		
Year	Indicator	Value	Forecast	Error	Standard quadratic deviation	Forecast	Error	Standard quadratic deviation
2011	Total sum of points	107,5	107,50	0,00		0,00	0,00	0,00
2012	Total sum of points	110	107,50	2,50	0,00	86,00	-86,00	0,61
2013	Total sum of points	123	109,50	13,50	0,01	17,20	-17,19	0,02
2014	Total sum of points	73	120,30	-47,30	0,42	3,45	-3,03	0,00
			82,46		0,14	1,03		0,21
				Accuracy	0,86		Accuracy	0,79

Source: authorial calculation

As a result of exponential smoothing (table 2), it was found with an accuracy of 86% of the forecast financial institution in 2015 has a total number of points according to the scoring methodology 82.46 points.

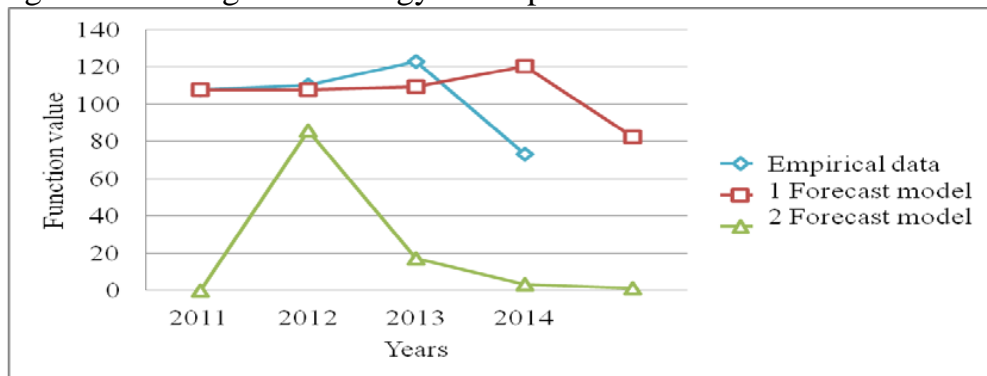


Fig. 1. Graphic interpretation of forecast models

Source: authorial calculation

In carrying out exponential smoothing was analysed the overall financial security of the bank and accomplished its forecast for the next period. The result is not a predictor for the institutions, as the bank got low, almost a critical level of financial security.

Because the forecast level of financial security of the bank is insufficient, as determined using the exponential smoothing, the financial institution should take specific and effective solutions to enhance its security.

The financial component is central to economic security. Therefore, ensuring its improvement and stabilization will lead to the effective economic activity of the bank.

In order to determine the adequacy of the model, we carried out research and determined the financial level of bank's security by a scoring method for the III quarter 2015.

Table 3

The data of total points of financial security for the third quarter of 2011- 2015

Indicator	The resulting scores				
	2011 year	2012 year	2013 year	2014 year	III quarter 2015 year
Return on assets	0,00	0,00	10,00	0	0
The level of interest margin	10,00	9,00	9,00	11	10
The effectiveness of the bank	10,00	9,00	11,00	10	0
Efficiency interest funds from operations	10,00	9,00	11,00	11	11
The effectiveness of the commission	10,00	11,00	9,00	10	11
Earnings per 1 employee	10,00	9,00	11,00	0	0
Liquidity (instantaneous)	0,00	11,00	11,00	11	5
The level of problem loans	10,00	9,00	9,00	0	10
Ratio of credit risk	10,00	11,00	11,00	0	0
Ratio of loans and liabilities	7,50	10,00	10,00	10	11
Capital adequacy ratio	10,00	11,00	11,00	0	0
Value received and issued interbank loans	10,00	11,00	11,00	10	10
The total foreign currency position	0,00	11,00	11,00	0	0
The total sum of points	97,50	121,00	135,00	73	68

Source: authorial calculation

As a result of the calculations, it was found that the bank during this period has a critical level of financial security. This is indicated by the total score of financial security by the scoring method, are 68 points.

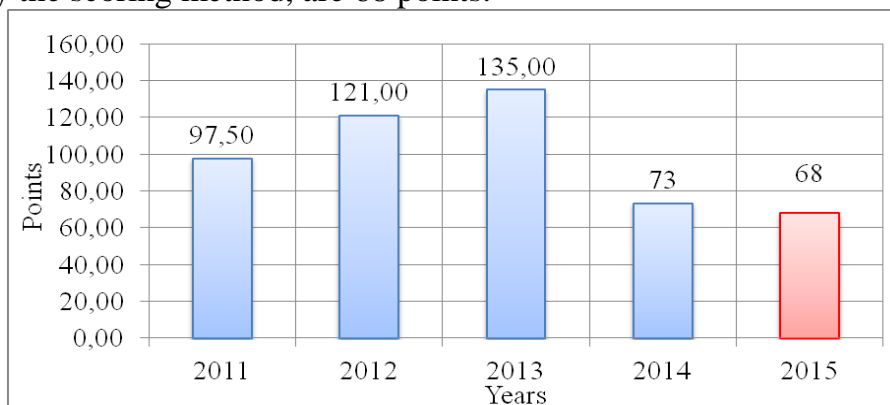


Fig. 2. Graphic interpretation for the total sum of points of financial security for the third quarter of 2011- 2015

Source: authorial calculation

Thus, the obtained results show the adequacy and effectiveness of this method for the analysis of the bank's financial security.

Conclusions. Safety of the banking system is an integral part of the economic sphere the national security of Ukraine and is characterized by safety functioning of each bank institutions acting in its territory. In general, economic theorists distinguish two approaches to determining the safety of the bank as a whole and economic security in particular. The first approach is based on using the concept of threat. The second based on the economic terms of achievement and further development. Bank security should be regarded as a state, feature and the ability to adequately respond to internal and external threats.

In our study was determined the level of financial security as a component of the economic for PJSC "Raiffeisen Bank Aval". Confirmation of worsening security situation has been predicting it by exponential smoothing. Because the traced negative trend to decrease it, was formed a set of measures that will improve the quality of the bank's activities.

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