OPTIMIZATION OF THE CREDIT RISK MANAGEMENT BASED ON ITS EVALUATION USING THE METHODS OF NONPARAMETRIC STATISTICS

У статті проведено оцінку кредитного ризику банківських установ України, проаналізовано основні причини погіршення якості кредитного портфелю та наведені пропозиції щодо вдосконалення кредитної політики банків

Ключові слова: кредитний ризик, динамічний індикатор, кредитна політика, банківський нагляд

В статье проведена оценка кредитного риска банковских учреждений Украины, проанализированы основные причины ухудшения качества кредитного портфеля и приведены предложения по совершенствованию кредитной политики банков

Ключевые слова: кредитный риск, динамический индикатор, кредитная политика, банковский надзор

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Problem

Growth of the distressed assets and the deterioration in the quality of the loan portfolio of the banking system of Ukraine proved the existence of low effectiveness of monetary policy oft he banks, and a tendency to credit risk remains a major source of problems for banks that's why the credit risk prediction is one of the ways to improve the credit process, including general system of supervision and management of financial flows of the bank as a whole.

Analysis of research and publications

The research of Prymostka L.O., Chub P.M, Vasyurenko O.V., Zagorodniy A.G., Voznyuk G.L., Lysenyuk O., Vitlinskiy V.V.,Karcheva G.T ., and many others are directed for solving this problem. Existing models of credit risk assessment need further improvement, which was confirmed by the complexity of their application or inability of economic interpretation of the results. Thus, there is a necessity of the methodological approaches to assessing of credit risk of the bank. The analysis of current scientific literature, namely article "Normative- indexed model of assesment of the cumulative risk assessment of the bank by means of nonparametric statistics" proposed by Prymostka L.O. and Lysenyuk O. allowed to formulate a hypothesis about the possibility of constructing a variant of a methodology for credit risk assessing.

Statement of purpose

The aim of our research is to optimize the process of assessing and managing credit risk by constructing the model to determine the degree of credit risk of the bank.

The main material

The work proposes to evaluate portfolio credit risk in the banking system, which will improve the efficiency of credit risk and the credit policy of banks in general.

This will provide an opportunity to assess lending activities of the banks, the ratings of riskiness of banking institutions by the bank supervisors.

The process of determining of the components oft he analysis and the degree of credit risk the bank was conducted in the following stages:

the selection of the indicators for the analysis of credit risk and determining of the standard correlations between growth rate oft he elements of credit risk assessment to the indirect indicators oft he riskiness of the banks;

constructing the dynamic normative between selected indicators riskiness;

selection the objects, taking the risk and forming the input data for the objects selection in terms of riskiness and calculating the growth rate for the period; defining the relationships between the growth indicators of the riskiness. Constructing a matrices of the actual performance ratios of the objects riskiness;

constructing a matrix of the correlations coefficients between factual matrix coeficients of objects with the dynamic normative;

summary calculations and economic interpretation of research results, determining the amount of matrices elements of actual and normative relations of each object and the amount of elements of the dynamic normative by modulus, calculation the degree of riskiness (Zkr) for research facilities.

The assessment of credit risk in the banking system of Ukraine was held on the 01.07.2011 and 01.07.2012.

The first stage of our research is the choice of indicators that characterize the credit risk of the bank.

As our model is based on a model by Prymostka L. and Lysenyuk O., which includes indicators that characterize the cumulative risk of banking activities, we take only a few of them that apply directly impact on the credit risk of banks (the number of indicators may be different, because there is no single approach to determine them, and therefore the views of various authors are different).

Create the following system of indicators (таble 1).

Table 1

Analytical coefficients of the riskiness of bank and normative relationship between ist gross rate

№	The coefficients	Method of calculation	Statutory changes ratios	Statutory correlation between the growth
1	2	3	4	5
1	Capital Adequacy	$H2 = K/Ar$	Increasing	$K(i) > Ar(j)$
2	Multiplier of capital	$MC = A/K$	Decreasing	$A(i) < K(j)$
3	Rate of risk credit portfolio	$RCP = RZ/KP$	Decreasing	$RZ(i) < KP(j)$
4	The share of the loan portfolio in total assets	$QKP = KP/A$	Decreasing	$KP(i) < A(j)$

In таble 1it is noted the indicators such as:

K – the capitalof the bank;
Ar - Risk weighted assets;
A - total assets of the bank;
RZ - reserves to cover credit risks;
KP - credit portfolio.

The next step is establishing a dynamic normative (таble 2) based on the detected correlations between the growth rates of certain indicators. «i» indicators are placed vertically and «j» indicators - horizontally. The value of „1" means that the growth rate «i» is more than «j» index. If they are placed conversely, at the intersection of performance put "-1". Where the value can not be established - put „0".

Table 2

Dynamic normative

Indicators	К	H2	A	RZ	KP
К	0	1	1	1	1
H2	-1	0	0	0	0
A	-1	0	0	1	1
RZ	-1	0	-1	0	-1
KP	-1	0	-1	1	0
Total	4	1	3	3	3

The next stage is the formation of a table of data determining the banking system of Ukraine using the observable indicators on the 01.07.2011 and 01.07.2012 and calculating the growth rates from the previous year. Calculation of growth rates from the previous year is determined by dividing the absolute value of the last year by the absolute value of the previous year(таble 3).

Table 3

Absolute value and growth rate of the indicators of the banking system of Ukraine

Indicators	Absolute values		The growth rate of about 2011
	01.07.2011	01.07.2012	
A	1019811043	1104395259	1,08
K	147816550	163775906	1,11
RZ	152729335	139076848	0,91
KP	789549434	676956094	1,86
H2	19,2	17,98	0,93

Then according to таble 3 form the actual correlations of selected indicators (таble 4). To build a matrix of actual correlations of the growth rate for 2011 it is necessary to rank the tables performance of absolute values and growth rates ascendinly.

Thus, from the table 3 on the 01.07.2011, the growth rate was K = 1.11 and H2 = 0.93, so practically K> Ar, ie, the growth rate of capital is larger than the growth rate of assets, weighted by risk. Therefore, at the intersection of row 1 and column 2 in таble. 4 put "1" and under at the intersection of row 2 and column 1 put "-1" and so on until the end.

Table 4

Matrix of correlations of actual performance of riskiness of the banking system of Ukraine on the 01.07.2012

Indicators	К	H2	A	RZ	KP
К	0	1	1	1	1
H2	-1	0	0	0	0
A	-1	0	0	1	1
RZ	-1	0	-1	0	1
KP	1	0	-1	-1	0

In таble 2 it is formed the matrix of riskiness indicators that is "ideal" fort he bank. According to it, we form a matrix of actual and normative relations of indicators of riskiness of banks. Comparing the matrix of normative and actual relationships , in the new matrix make a mark as follows: if the value of "1" and "-1" in the matrices are the same we put "1", if the value of a matrix of "1" and the other "-1" - put "-1", the place where in the matrix of actual and normative indicators of riskiness was "0" - put down "0" (таble 5).

Table 5

Matrix of factual and normative relations between indicators of riskiness of the banking system of Ukraine on 01.07.2012

Indicators	К	Н2	A	RZ	KP
К	0	1	1	1	1
Н2	1	0	0	0	0
A	1	0	0	1	1
RZ	1	0	1	0	-1
KP	1	0	1	-1	0
Total	4	1	3	2	1

Based on the above matrix formed, calculate the degree of riskiness (Z_{kr}) on the banks by dividing the total amount of elements of a matrix of compliance of actual and normative relations to the total amount (in absolute value) of matrix elements of dynamic normative:

$$Z_{kr} = \frac{\sum\limits_{i=1}^{n}\sum\limits_{j=1}^{n} d_{iy}}{\sum\limits_{i=1}^{n}\sum\limits_{j=1}^{n} \left| e_{ij} \right|},$$

where
$$d_{ij} = \begin{cases} 1, \text{if} P\left(d_{iy} = d_{iy}\right) = 1; \\ 1, \text{if} P\left(d_{iy} = d_{ij}\right) = 0 \end{cases}$$

$$\left| e_{ij} \right| = \left(P\left(d_{ij}=1\right) \cup P\left(d_{iy}=-1\right)\right) = 1$$

So, calculate the value of riskiness of the banking system of Ukraine on the 01.07.2012:

$$Z_{kr} = 11/14 = 0.79.$$

Conclusions

According to the model of cumulative risk of the bank, the obtained values can be described as follows: assumed that the threshold is 0.5.

The closer it is to 1, the more the banking system is close to the ideal model, ie compliance to standards; despite the fact that the banking system of Ukraine in 2010-2011 began to revive after the severe consequences of financial crisis, the results of 2012 show a substantial performance improvement of the banks, since the deviation from the boundary is 0.21.

The deviation was mainly due to the slowdown in credit extension rate and at the same time with extended growth of other active operations, and consequently, reducing reservation volumes.

Given these results, the banks of Ukraine should increase the volume of lending as the main source of income through increased public confidence and supporting of entities, and should improve the mechanisms for managing credit risk, and hold more diversified policy, pay great attention to reservation as a guarantee of compensation for losses from loan defaults.

Literature

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Abstract

The research on the functioning of the system of risk assessment becomes especially important and requires the development and implementation of practice strategies for effective banking supervision and risk management.

In this article an assessment of the credit risk of banks of Ukraine is provided, the main causes of deterioration in the quality of the loan portfolio are analyzed and the proposals of improving the credit policy of banks are presented.

As a result of this work the authors concluded the practical feasibility of using the proposed model of dynamic indicator for assessing credit risk and optimization the management of banking risks

Keywords: *credit risk, momentum indicator, monetary policy, banking supervision*