

New Methodological Approaches to the Rapid Assessment of Efficiency of Activity of Credit Organizations (Regional Aspect)

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Abstract-The subject of this study is the economic relations arising in the process of evaluating the efficiency of banking activities in the conditions of interbank competition. A competitive banking system is an indicator of a country's market economy. Credit organizations, as active players in the financial market, offer clients banking services permitted by the Russian Federation law system. Currently, emerging economic crises affect the number of operating banks in the Russian Federation and the financial performance of commercial banks, as well as the quality and cost of banking services offered. The existing realities give rise to topics related to the prospects for the development of the financial services market and the evaluation of the efficiency of credit organizations. The authors propose their own approaches to provide insight into bank performance, taking into account the interests of investors and other stakeholders who are not insiders of banks. The study may be of interest from both a scientific and a practical point of view, in terms of application of its results. The study emphasizes the relevance of creating a mechanism for early informing all stakeholders about the true situation in a particular bank. The authors offer their own methodology, which allows to evaluate the activities of the bank according to indicators calculated on the basis of freely available information published by commercial banks and the regulator.

Objective is to develop the scientific and methodological framework for evaluating the efficiency of a commercial bank under interbank competition.

The methodological framework of this study includes such methods of scientific research as economic and mathematical methods of information processing, statistical and comparative analyzes, graphical, point-rating approaches to data analysis, as well as methods of cluster analysis.

Main results: 1. A comparative analysis of methods for evaluating the economic situation of a commercial bank was conducted. It showed the need for applying new methodological approaches to improve the evaluation of bank performance and adapting existing methods to changing external and internal conditions of credit organizations under interbank competition in the regional financial market. 2. A new methodological approach to evaluating the efficiency of a commercial bank is proposed based on the determination of

the nature of a commercial bank and the main task of a credit organization to be effective for owners and shareholders, to bring the maximum useful result - to improve the welfare of its owners. Moreover, the main indicators of the bank performance in the group of profitability indicators include: ROA, ROE, return on sales, value added and ROI of employees; in the capital group: capital adequacy, capital multiplier and capital protection ratio, as well as current liquidity and assets quality. 3. A methodology for evaluating the efficiency of a commercial bank based on integral indicators is presented. 4. The methodology was tested on commercial banks of the Ural Federal District. 5. The directions for adjustment of actions of the bank management body on the basis of evaluating its performance efficiency were determined.

Keywords-commercial bank, bank performance, performance indicators, financial market

I. INTRODUCTION. OBJECTIVE SETTING

An important strategic task for the socio-economic development of Russia is the creation of a competitive banking system, which, on the one hand, defines the financial basis of the national economy, and on the other hand, serves as an indicator of the efficiency of banking management sector. The development of the financial market makes one to reconsider the principles of commercial banks, which are based on the creation of competitive advantages. To increase the competitiveness of commercial banks, a new management system is needed, including the organization and implementation of measures to enhance competitive advantages. The main element of such a system is an evaluation of competitiveness, aimed at identifying factors contributing to an increase in the efficiency of a bank.

Despite the variability of research work conducted by scholars and practitioners in the field of evaluating the efficiency of banking system, most of the issues in this area remain debatable. The lack of unified standards generally

accepted and agreed methodology for evaluating the efficiency of the bank activities proves this problem to be insufficiently studied.

To justify the relevance of the topic it is necessary to note the following. The complexity of the formation of market relations, high rates of concentration and centralization of capital, changes in management systems lead to changes in the efficiency of banks, which require new approaches and methods in evaluation and management. The relevance of the study is determined by the need to solve the scientific and practical problem of ensuring the effective functioning of the bank in the interbank competition.

II. THEORY AND METHODS

Methods of analyzing the economic situation of commercial banks should reliably assess the degree of bank security and the ability to fully comply with obligations on time. Currently, there is no uniform methodology that could quickly evaluate the performance of a commercial bank. Different objectives account for different approaches to analyzing the economic performance of a bank, the approach of the Central Bank of the Russian Federation, as well as the approaches of independent expert agencies and bank analysts, they use different evaluation methods and different sets of key indicators. The Bank of Russia evaluates the economic performance of commercial banks on the basis of published official statements, taking into account the developed mandatory standards for commercial banks [2]. Analysis of standards determines how the book-keeping records correspond to the real economic status of a commercial bank. The Central Bank of the Russian Federation has developed criteria for the degree of problematic banks (financially stable commercial banks and banks in a pre-bankrupt state). For the study, the authors distinguish the following official methods: the methodology of the Central Bank of the Russian Federation, which is now used to evaluate the economic status of banks according to official documents, the CAMELS methodology for evaluating US banks [3] and the well-known methods of experts that have long been used in the national practice of bank evaluation, i.e. approach of V.S. Kromonov and the approach of Professor E.S. Stoyanova [5, 12]. It should be noted that the authors do not claim to have filed a complete list of expert methods, since this was not one of the research objectives. Based on the analysis of existing methods, their advantages and disadvantages, a set of indicators has been compiled which will help to fully evaluate the efficiency of a commercial bank. The analysis included the study and structuring of indicators of each of the selected methods, as well as methodological approaches to the evaluation of indicators and their aggregates. The authors analyzed each method according to the following algorithm: purpose, objectives, advantages, limitations, conceptual apparatus and content of the method. As soon as the authors carried out a comparative analysis of all indicators with formalized values without exception, according to all the above mentioned methods, they

identified a set of indicators that are used in more than two methods (19 indicators in total). Special attention was paid to the indicators, which are reflected in the methodology of the Central Bank of the Russian Federation. All indicators found in alternative methods are also in the methodology of the Central Bank of the Russian Federation, the exception being the indicator of investment activity. It is worth pointing out that the greatest compliance with the methodological approach of the Basel Committee on Banking Supervision is present in the indicators of the official methodologies of regulators of the Central Bank of the Russian Federation and the Federal Reserve Service of the United States. With regard to expert techniques, it is worth noting that one of them (the methodology of VS Kromonov's group) is more focused on indicators of capital adequacy and liquidity of the bank; the second (the methodology of Professor ES Stoyanova) is focused on the economic efficiency of bank performance [6, 7]. The analysis also revealed that none of the studied methods reproduces the others. This is due to the different focus of the techniques. The next stage of the study was the selection of the most significant indicators, based on their frequency in the methods under consideration and their analysis according to the data of commercial banks of the Ural region [1, 10, 11].

III. PRACTICAL ANALYSIS

The empirical analysis covers the indicators of financial performance of 31 banks of the Ural Federal District in total, which were not in the process of resolution from 2010 to 2014, the period when the macroeconomic situation in the country remained stable. For the sample, official data of the State Agency of Deposit Insurance were used, for analysis - official reports: turnover reports, balance sheets, reports on financial results of commercial banks, published on the official website of the Central Bank of the Russian Federation.

According to the results of the preliminary qualitative analysis, we sampled the indicators of the bank performance which were later used for calculating the integral indicators (Table 1).

As a result of data classification by different cluster analysis algorithms and comparison of the results, the conclusion was drawn that the K-means method gives the best result of cluster formation, since this method allows us to effectively and unambiguously differentiate estimates into groups, taking into account their similarity between each other [4, 13, 14].

The clustering procedure was carried out using the software package "R". Logical processing according to the results of cluster analysis of data allows us to group commercial banks of the Ural region into 3 clusters. The first cluster is made up of medium-efficiency banks, the second cluster comprises inefficient banks, and the third cluster covers effective banks.

TABLE 1 - KEY INDICATORS FOR EVALUATING THE EFFICIENCY OF A COMMERCIAL BANK

Group of indicators	Indicators
Profitability	ROA
	ROE
	Return on sales
	Value added
	ROI of employees
Capital	Capital adequacy
	Capital multiplier
	Capital protection ratio
Liquidity	Current liquidity
Asset quality	Operating Assets quality indicator

A graphical presentation of the results of cluster analysis is given in Figure 1.-. It illustrates the separation of data on banks in the Urals Federal District into three clusters.

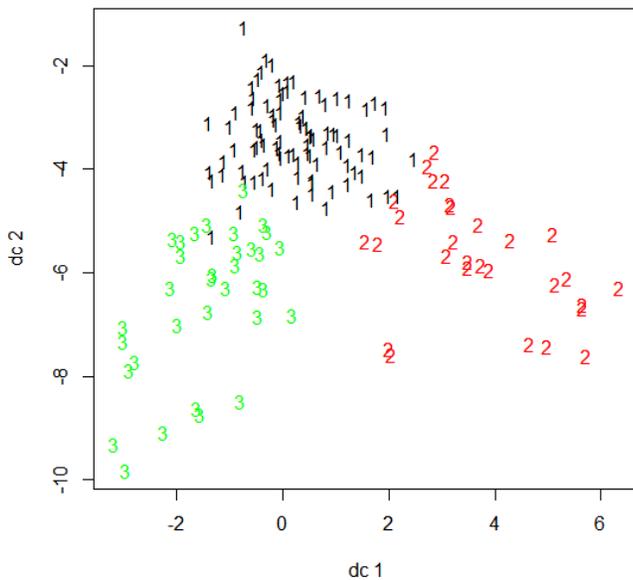


Figure 1 – Results of cluster analysis of banks of the Urals Federal District

TABLE 2 - NUMERICAL CHARACTERISTICS OF PRINCIPAL COMPONENTS

	PC1	PC2	PC3	PC4	PC5
Standard deviation	0.4290	0.2894	0.2348	0.22412	0.20728
Proportion of Variance	0.3651	0.1662	0.1094	0.09965	0.08523
Cumulative Proportion	0.3651	0.5313	0.6407	0.74035	0.82558

TABLE 3 – CLUSTER CENTERS FOR THE TWO MAIN COMPONENTS

Principal component	Clusters		
	1 st cluster	2 nd cluster	3 rd cluster
1 st principal component	-0,21	-1,09	-0,13
2 nd principal component	0,18	0,31	0,72

The summary results of the analysis are presented in Tables 2-3, on the basis of which the following conclusions can be drawn:

- the first cluster included medium-sized commercial banks in terms of efficiency of their activity;
- the second cluster comprised banks with low efficiency;
- the third cluster is formed by banks with high performance.

According to the results of the classification of these banks, it can be concluded that banks have quite significant differences in the results of their economic activities. Next, a component analysis was performed to rank the banks according to their economic activity. Component analysis is linear and additive. It does not require any hypotheses about variables. When used, there occurs an orthogonal transformation of the original features to the principal components, which are statistically dependent. The principal components are not inter-correlated and are ordered by the value of their dispersion, with the first main component having the greatest dispersion, and the last one having the smallest. Throughout the analysis, implicit, directly immeasurable, but objectively existing patterns, caused by the action of both internal and external factors, are identified. The set of principal components defines a convenient coordinate system, and the corresponding dispersions of principal components describe their statistical properties. Among the total number of components for the study, the most significant ones are selected, those making the maximum contribution to the total variance. For economic interpretation, the best case is when the number of principal components is not greater than three. This method helped to single out two principal components that account for 53% of the data variance, which allowed us to graphically present the result (Table 2). The increase in the number of principal components did not qualitatively improve the result of the classification of banks. The first principal component was interpreted as the level of total return on assets, the second principal component was interpreted as the total return on capital [4, 8, 9].

Thus, the results of cluster analysis give one an opportunity to rank regional banks by degree of efficiency. The degree of bank efficiency decreases with the transition from one cluster to another. The most effective banks are in the 3rd cluster, the average in terms of efficiency are the banks of the 1st cluster and the inefficient ones are the banks of the 2nd cluster.

However, it should be noted that performance indicators characterize banks in tactical development, ensuring the possibility of operational impact on the bank functioning. The results are necessary when decisions are made by the owners of the bank. Thus, the proposed tool for grouping banks in the region allows us to identify the most effective ones and identify the top bank in the regional banking sector. The results are of interest for ranking the banks by their investment attractiveness, as well as for making management decisions on the creation of an optimal banking network in the region in the context of interbank competition.

It should be noted that the evaluation of the activities of a commercial bank by the Central Bank of the Russian Federation is carried out based on a much larger amount of information, which until a certain time is not available not only to owners (investors) and bank customers, but also to employees who are not insiders of a particular credit institution. The final evaluation of the Central Bank of the Russian Federation is available only to the sole governing body of the bank. As a result, only private individual customers (and even with a significant time lag) can be guaranteed the return of their deposits at the expense of the Fund for Mandatory Insurance of Deposits of Individuals in Commercial Banks, which is managed by the Deposit Insurance Agency. For legal entities, including bank owners, there is a high probability of financial losses due to the inability of a bank to ensure timely settlement transactions on client accounts.

We performed the ranking of regional banks from our sample, taking into account the values of the constructed integral indicators in the following way.

Integral performance indicator (IP1) =

$$= -0.43 * ROA - 0.28 * ROE - 0.47 * \text{Return on sales} +$$

$$+ 0.11 * \text{Value added} - 0.32 * \text{ROI of employees} - 0.4 * \text{Capital adequacy} + 0.3 * \text{Capital multiplier} + 0.29 * \text{Capital protection ratio} - 0.18 * \text{Current liquidity} - 0.16 * \text{Operating assets quality indicator} - \text{This is an integral indicator for the classification of inefficient and other banks.}$$

Integral performance indicator (IP2) = $0.26 * ROA + 0.4 * ROE + 0.15 * \text{Return on Sales} +$

$$+ 0.49 * \text{Value added} + 0.18 * \text{ROI of employees} - 0.32 * \text{Capital Adequacy} + 0.57 * \text{Capital Multiplier} - 0.14 * \text{Capital Protection Ratio} - 0.11 * \text{Current Liquidity} - 0.13 * \text{Operating assets quality indicator} - \text{This is an integral indicator for classifying medium-efficient and efficient banks.}$$

The integral indicator (IP1) allows to classify inefficient commercial banks. The integral indicator (IP2) makes it possible to separate efficient commercial banks and medium-efficient ones.

TABLE 4 - CLASSIFICATION OF COMMERCIAL BANKS BY THEIR DEGREE OF PERFORMANCE EFFICIENCY, NORMALIZED INTEGRAL INDICATORS

If integral indicator IP2 falls within these limits, it belongs to the 1 st cluster	If integral indicator IP1 falls within these limits, it belongs to the 2 nd cluster	If integral indicator IP2 falls within these limits, it belongs to the 3 rd cluster
0	0	49
49	55,17	100

In order to classify a new research subject (bank), it is necessary to apply the bank performance figures into a formula for calculating integral indicators, compare the obtained results with the ranges of integral indicators for each cluster (Table 4) and make a conclusion about the degree of efficiency of the studied bank.

IV. RESULTS

Summing up the research, it is worth noting that an attempt has been made to consider the strengths of a number of well-known methods, to integrate new methodological approaches into the system for evaluating the efficiency of the bank activities. As a result of the study, a new method for evaluating the efficiency of commercial banks was proposed, taking into account the expectations of the owners of the banking sector. A mechanism for early informing the owners, those who directly invest in the bank and are not aware of insider information, has been created. The creation of such a technique was made possible based on the official information published by the regulator and due to professional expertise. The methodology includes both indicators of official reporting and indicators of expert methods which have performed well over a long period of use. The method allows one to quickly monitor the performance of a bank without waiting for the regulator to make a formal decision on the results of the evaluation of the bank in question, and then to timely adjust the course of bank management aimed at the development and increase in the value of the bank.

The ranking of commercial banks in the regional sector of the Urals Federal District made it possible to evaluate the efficiency of the activities of regional commercial banks from sample study, to determine the increase limits of key performance indicators of the bank. This toolkit will help banking management body to make timely management decisions on capital and asset management, liquidity and profitability indicators, - As a result, this will lead to an increase in the efficiency of a commercial bank in the interests of business owners.

V. CONCLUSIONS

The construction of summary analytical integral indicators reflecting the indicators of profitability, capital adequacy, current liquidity and asset quality underlies the idea of evaluating the performance of a commercial bank. The modern tendencies are revealed and the most important

directions of efficiency development of banking activities are substantiated, and the fundamental focuses of improving the management of banking efficiency under interbank competition are determined. The results of this work show the potential for improving the efficiency of a bank, and the application of the proposed analytical methods will stimulate the development of management decisions by the bank management body. This, in turn, will have a positive impact on the possibility of increasing the profitability of banking activities and will allow increasing intra-industry reserves to maintain the stability of the banking industry without government assistance as represented by the regulator. The methodological and practical solutions proposed by the authors in the field of managing the efficiency of banking activities under interbank competition form an analytical framework capable of setting the desired vector of further research attempts to evaluate the performance of the Russian banking sector under tightening both external and internal requirements.

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