“Tools for assessing and forecasting financial stability of the commercial bank under conditions of instability”

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Tools for assessing and forecasting financial stability of the commercial bank under conditions of instability

Abstract

This article deals with the problem of an adequate assessment of credit organization financial stability. The authors developed the indicative model of assessment of the bank financial stability based on calculation of the integral indicator for solving this problem. Advantages of model are the high speed of analysis, accessibility for understanding, the possibility of use by a wide range of the interested users, and also comparison of credit organizations indicators. Using indicative model on a regular basis will allow not only to reveal problems of commercial banks, but also to take timely measures to eliminate them. We had approved this model for assessment of regional banks of the Republic of Tatarstan financial stability. Summarizing the results of analysis of financial stability of regional banks we can make up a conclusion about relative stability of the banking sector of the Republic of Tatarstan.

Keywords: financial stability, credit institution, indicative model, indicators, coefficients, ratios, assets, liabilities, capital adequacy, profitability, liquidity.
JEL Classification: G21.

Introduction

With the globalization of the world economy growing role of its financial component, reflected in a significant increase in scales, the strengthening of the unity and the role of the global financial markets can clearly be seen. The growth of global financial assets and the flow of foreign investments are one of the brightest examples of financial globalization. At the present stage of development in the global financial markets a high level of instability that is associated with both economic and political risks remains. Against the backdrop of the global economic slowdown the authorities and leading central banks take action to support economic growth and the fight against the debt crisis, international organizations working on measures to strengthen the financial system. The Russian economy is strong enough to expose to the impact of slowing global economic growth, worsening debt crisis and the increasing volatility in global financial markets. Because of the specific structure of the Russian economy, and a large share of oil and gas revenues in total export earnings, gap in energy prices, the outflow of capital on the presence of a high proportion of non-residents in the stock market and, as a consequence, the weakening of the payments balance are the most significant factors in the deterioration of the situation in the Russian financial sector. However, the implementation of large-scale external shock such events in 2008, is unlikely in view of the fact that the major central banks continue to boost the economy, regulators and supervisors are better informed about the links between financial markets participants. But in case of an adverse events (e.g. a sharp increase in the debt crisis), the Russian financial system would face with a number of adverse effects in the short and medium terms. First and foremost, these consequences would concern the Russian banking system, which the most important part are regional banks that perform an important social function, meeting the needs of the population and enterprises in banking services, smoothing significant disproportions in the provision of banking services in the regions of Russia with a total backlog of the indicator by global standards. In this regard, the assessment of the financial sustainability of the regional banks in relation to external shocks and the possible upcoming crises is rather important. That's why the object of research is business processes and *cause-and-effect relations* causing regional commercial banks financial stability.

1. Literature review and assessment techniques of the commercial banks financial stability

The problem of assessment of commercial banks financial stability in I.V. Vishnyakov, Yu.Yu. Rusanov, Z.A. Timofeyeva, G.G. Fetisov, O.I. Lavrushin, G.N. Scherbakova, V.V. Ivanov, S.M. Ilyasov, E.A. Tarkhanova and other works is investigated. However in the field of stability of banks there are still many unsolved problems both theoretical and practical. The analysis of the works of these authors is showed that researches of banks financial stability are in an incomplete state: publications are devoted mainly to the description of practical aspects of the problem, individual methods of the analysis of banks financial stability.

So currently, there are a great variety of methods of commercial banks financial stability assessment, that allows to make high-quality and reasonably accurate conclusions. The current methodology for assessing the financial stability of commercial bank

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is divided into two groups, namely, foreign and Russian, which is clearly shown in Figure 1. Despite variety assessment techniques of financial stability of credit organization, the ideal model which allows precisely determining bank stability still isn't created; the uniform indicator of its assessment isn't deduced. Advantages and disadvantages of assesment techniques of financial stability of commercial banks are presented in Table 1. That's why it is very important to develop an adequate assessment technique of financial stability of banks including regional banks, because there isn't a special model for assessing the financial soundness of regional banks and current methodology, that has a lot of disadvantages and is difficult for use by wide range of the interested users.

Techniques of the Bank of Russia and other Russian techniques (methods of rating and information agencies, author's methods) are constructed on calculation of certain coefficients by results of which analytics make conclusions about bank stability. As for foreign techniques, rating systems are the effective tool for assessment of the bank current financial situation and definition of existing problems. Ratings are defined both on the basis on quantitative indices and an expert assessment of qualitative data. The main lack of rating systems is that they don't define potential problems in commercial banks activity and don't predict the possible scenario of its development. Coefficient analysis systems are based on calculation and identification of dynamic changes of a significant amount of indicators and coefficients, and also on carrying out comparisons of groups of banks. Comprehensive evaluation systems of banking risks are based on allocation in banks of considerable functional units, and also on assessment of each unit by types of risks and categories of risks control. Features of statistical systems of an assessment of commercial banks financial stability are formation of projection of commercial banks activity, definition potential problems and risks and use only quantitative data and a complex of statistical modules, programs and approaches.

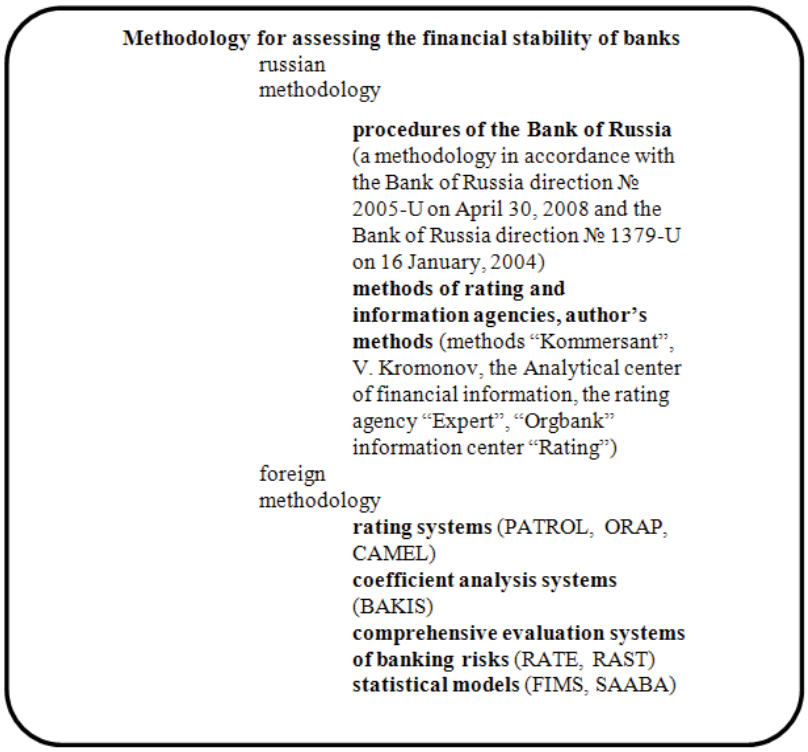

Fig.1. Methodologies for assessing the financial soundness of banks

Table 1. Advantages and disadvantages of assesment techniques of the financial stability of commercial banks

Techniques	Advantages	Disadvantages
CAMELS	- a standardized method for assessing banks; - ratings for each indicator indicate directions for their increase; - summary score expresses the degree of intervention required to be undertaken in relation to the bank from the regulatory authorities.	- is largely based on expert (subjective) estimates, so the quality of the final result will depend largely on the professionalism of supervisors.
ORAP	- high speed of analysis, due to the small amount of performance and ease of obtaining baseline data.	- designed only to assess the current state of the bank.

Table 1 (cont.). Advantages and disadvantages of assesment techniques of the financial stability of commercial banks

Techniques	Advantages	Disadvantages
BAKIS	- standardization technique that speeds up examination of the bank and allows to use its wide range of customers; - a significant number of factors used makes it possible to analyze all aspects of the activities of the bank; - study of a group of banks allows to identify common trends in a particular sector or in the banking system as a whole.	- the use of methods is hampered define a significant number of factors; - the investigation of banks, their selection is made based on the size of activity that leads to the accounting system cannot shift the whole group; - the use of techniques is limited to the identification of those aspects of the credit institution which need the special attention from regulatory bodies [Hodachnik, G.E., 2009].
PATROL	- the speed of analysis, so as to determine the coefficients used standardized reports; - efficiency of evaluation of the current state of the bank.	- the result of the analysis fairly reflects only the current state of the bank.
SAABA	- longer forecast.	- definition of probability of default for each issued credit is costly labor.
V. Kromonov procedure	- openness methodology; - its constant improvement; - reliability and simplicity; - logical consistency and solidity.	- sufficient controversial normalization factors; - it is unclear on what basis these reliability criteria were taken and weigh coefficients were defined [Tarhanova, E.A., 2004].
Methodology Analytical center financial information	- evaluation of quality indicators (including the quality of bank assets), which, of course, adjust the results obtained on the basis of absolute figures and financial ratios.	- requires maintenance of a powerful apparatus of gathering information and conducting continuous monitoring of the study population, which increases the cost of the rating [Fetisov, G.G., 1999].
The technique "Orgbank"	- initial construction of evaluation system is made and corrected by an expert of statistical information.	- a particularly sensitive place when using these techniques is to obtain the correct expert information on group of banks, which largely depends on the accuracy of the resulting [Shevrinovsky, V.N., 2009].
Methods agency "Expert"	- the study of the bank in two directions using two-criteria statistical analysis, rather than building a unified evaluation system.	- do not take into account non-quantitative indicators.
Method according to the Directive of the Central Bank of the Russian Federation № 1379-U on January 16, 2004	- determination of the synthesis result, characterizing the degree of stability of the bank as a whole; - to add new criteria to be used to draw conclusions about the financial stability of the bank.	- assessment is static; - does not provide predictive values; - may be a lagging indicator in relation to financial problems; - does not exclude subjective approach to the assessment of credit institutions by the Bank of Russia.
Method according to the Directive of the Central Bank of the Russian Federation № 2005-U on April 30, 2008	- more detailed guidance regarding valuation techniques of risk management procedures; - a new record; - assessment of strategic risk management; - provides for the calculation of predictive values of estimates of capital and profitability.	- the method used in the ranking values of the indicators on points and weights is extremely expert; there is no clear description of the over / under the influence of an indicator in a group performance; - is not excluded a subjective approach to the assessment of credit institutions by the Bank of Russia.

2. Indicative model of credit organization financial stability assessment

In this regard the indicative model of assessment of bank (including regional banks) financial stability was developed. This indicative model consists of four consecutive stages reflected in Figure 2.

We will consider each of stages in detail. At the first stage according to the published accounting of bank the particular indicators components representing coefficients and standards, entering in the system of the indicators for determination of financial stability of the credit organization presented in Table 2 are carried out.

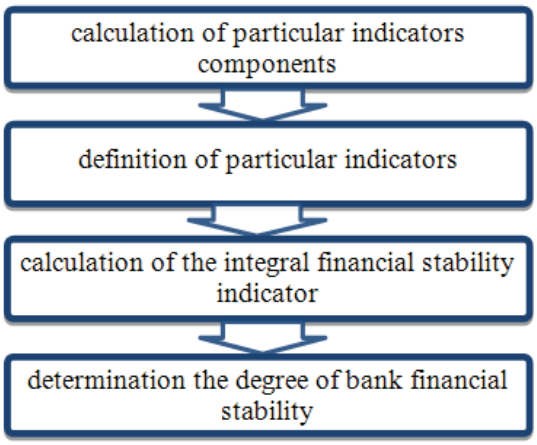

Fig. 2. Stages of indicative model of assessment of the credit organization financial stability

Table 2. System of the indicators entering the financial stability indicator

Data	The coefficients, standards	Designation	Procedure of calculating of coefficients, standards
Capital adequacy	Capital adequacy ratio	Car	(Equity / Assets risk-weighted) × 100%
	Core capital adequacy ratio	Cca	(Core capital / Assets risk-weighted) × 100%
Liquidity	Standard of instant liquidity	Sil	(Highly liquid assets / Demand on liabilities) × 100%
	Standard of current liquidity	Scl	(Liquid assets / Demand on liabilities and up to 30 days liabilities) × 100%
	Coefficient of general liquidity	Cgl	(Liquid assets / (Total assets - Required reserves)) × 100%
Liabilities quality	Coefficient of client base	Ccb	((Deposits citizens + Fund of legal entities) / Total raised funds) × 100%
	Coefficient of stability of resource base	Csrb	((Total liabilities-Demand on liabilities) / Total liabilities) × 100%
	Coefficient of dependency of interbank loans	Cdil	(Interbank loans / Total raised funds) × 100%
Assets quality	Coefficient of aggression of credit policy	Cap	(Loan debt / Total raised funds) × 100%
	Coefficient of loan debt quality	Cql	((Loan debt provision for possible loan losses) / Loan debt) × 100%
	The share of arrears	Sa	(Arrears / Loan debts) × 100%
Profitability (unprofitableness)	Coefficient of assets profitability	Cpa	(Profit (loss)/ Total assets) × 100%
	Coefficient of capital profitability	Cpc	(Profit (loss)/ Equity) × 100%

At the second stage on the basis of the components calculated at the previous stage for each of stability criteria, namely capital adequacy, assets quality, liabilities quality, liquidity and profitability are deduced particular indicators presented in Table 3.

Table 3. System of the indicators used for assessment of commercial banks financial stability

Indicators	Designation	Indexes for calculation the indicators
Capital adequacy indicator	CAI	$CAI = \sqrt[2]{Car * Cca}$
Liquidity indicator	LI	$LI = \sqrt[3]{Sil * Scl * Cql}$
Liabilities quality indicator	LQI	$LQI = \sqrt[3]{Ccb * Csrb * Cdil^{-1}}$
Assets quality indicator	AQI	$AQI = \sqrt[3]{Cql * Cap^{-1} * Sa^{-1}}$
Profitability (unprofitableness) indicator	PI(U)	$P(U)I = \sqrt[2]{Cpa(Cpa^{-1}) * Cpc(Cpc^{-1})}$

At the following stage calculation of the integral financial stability indicator of bank as geometrical mean of capital adequacy, assets quality, liabilities quality, liquidity and profitability indicators is carried out.

$$FSI = \sqrt[5]{CAI \times LI \times LQI \times AQI \times P(U)I} \times 100\% \quad (1)$$

where FSI – financial stability indicator; CAI – capital adequacy indicator; LI – liquidity indicator; LQI – liabilities quality indicator; AQI – assets quality indicator; $P(U)I$ – profitability (unprofitableness) indicator.

And at the last fourth stage based on the received value of the integral indicator the credit organization will belong to one of 3 groups of stability. On the basis of professional motivated judgment and optimum value of the integral indicator calculated on the basis of recommended components values, we had allocated the following 3 groups of banks:

- stable credit organizations (indicator value – 45% and above);
- banks with the balanced financial stability (indicator value – 35-45%);
- relatively unstable credit organizations (indicator value – below 35%).

The advantages of this model are:

a) Use of geometrical mean for calculation of particular indicators and the integral financial stability indicator causes a number of advantages of indicative model. So the advantage of using geometrical mean unlike arithmetic mean is that geometrical mean considers asymmetry of distribution. It becomes especially important when indicators have essential dispersion of deviations because of application in calculations values of different scales. Striking example of application of geometrical mean is calculation of stock indexes in Great Britain. One of the most prominent is the FTSE-30 index. Besides use in the financial stability indicator arithmetic mean instead of geometrical mean can lead to loss by the indicator of its universality. It is connected with that each bank has its own idea of indicators influence on stability. In this case there is a need to adapt the integral indicator for activity of each individual bank. Use geometrical mean in calculation of the indicator allows adding into the indicator other indicators without adjustment. In case of application arithmetic mean we have to reconsider the weight of each indicator due to addition new or deletion from the integral indicator old indicators that if we use a large number of indicators it is very difficult.

b) High speed of analysis, simplicity, accessibility for understanding and possibility of use by wide

range of the interested users that is connected with a small amount of indicators and ease of receiving basic data.

c) Definition of resumptive result (the integral financial stability indicator), characterizing the degree of bank stability as a whole.

d) The results of the analysis can be used for comparison with indicators of credit organizations.

At the same time this model has some shortcomings:

a) the result of the indicative model authentically reflects only the current state of the credit organization;

b) quality indicators aren't considered.

3. Approbation of credit organization financial stability assessment indicative model

We had approved this model for assessment of regional banks of the Republic of Tatarstan financial stability, because assessment of regional banks as significant part of Russian banking system is very important.

According to the first stage we had calculated components of particular indicators of capital adequacy, assets quality, liabilities qualities, liquidity and profitability. Further we had defined values of particular indicators and the integral financial stability indicators of regional banks for 2009-2012 and had classified each bank to one of 3 groups of financial stability. The results of the third and fourth stages are presented in Table 4.

After analyzing all particular indicators included in the integral financial stability indicator, and also their components we had revealed the following features characterizing each of the group of financial stability:

1. Stable banks:

a) Stability of the banks was provided by high profitability of their activities, and also sufficient liquidity which indicated that banks had balanced structure of assets and liabilities.

b) Financial stability of the banks in medium term can be reduced because of insufficient quality of capital, assets and liabilities, associated with aggression of their credit policy that increases credit risk, and as a result, probability of losses. Poor quality of credit portfolio indicating that unqualified management approaches of a credit portfolio are used with insufficient capitalization of some of banks. But the size of capital defines ability of bank to maintain stability during the crisis periods, dependence on interbank credit market and significant share of demand liabilities in structure of bank liabilities. The considerable share or active growth of such mobile, difficult to predict resources is dangerous, because recall of these funds or their spending can lead to bank insolvency, and as a result to loss of bank stability.

2. Banks with balanced financial stability:

a) Financial stability of banks was maintained by sufficient capitalization which characterized the security level of risk assets and acted as the guarantor of bank reliability and liquidity, and also high profitability demonstrated effectiveness of credit organizations resources use.

b) Problem areas of this group of banks were the poor quality of assets and liabilities due to a considerable share of the overdue credits and demand liabilities, dependence on interbank credits that on the one hand characterizing unstable position of bank, but on the other hand showed trust in bank from other banks, the aggressive credit policy, and also poor quality of credit portfolio.

3. Relatively unstable banks:

a) Some banks in this group were characterized by sufficient level of liquidity and qualitative resource base which is important because the raised funds take vital share in structure of bank resources and they provide to meet needs of the enterprises, the organizations and the population, including credit resources requirements.

b) Relative instability banks were connected with undercapitalization, a considerable share of the interbank credits in structure of liabilities and overdue credits, poor quality of credit portfolio, and in some cases with aggressive credit policy and insufficiently stable resource base.

As we can see banks with the balanced financial stability have much less problem zones which can lead to stability decrease, than stable banks. At the same time problems of stable banks aren't so serious and they can decide them in short-term.

Table 4. Indicators of the regional banks financial sustainability [Bank of Russia, 2014], %

Banks	01.01.2013	01.01.2012	01.01.2011	01.01.2010	Category
Bank 1	97.74	77.89	63.26	50.38	stable credit institution
Bank 2	55.53	52.78	44.31	48.22	stable credit institution
Bank 3	64.60	43.56	22.52	17.11	bank with balanced financial stability
Bank 4	24.19	27.97	27.01	29.18	relatively unstable credit institution
Bank 5	47.66	48.63	24.26	30.55	bank with balanced financial stability
Bank 6	39.07	40.05	29.79	40.07	bank with balanced financial stability

Table 4 (cont.). Indicators of the regional banks financial sustainability [Bank of Russia, 2014], %

Banks	01.01.2013	01.01.2012	01.01.2011	01.01.2010	Category
Bank 7	34.59	38.07	24.67	40.96	relatively unstable credit institution
Bank 8	26.72	36.94	35.42	31.65	relatively unstable credit institution
Bank 9	49.46	50.94	26.87	26.24	bank with balanced financial stability
Bank 10	81.32	74.44	92.43	96.86	stable credit institution
Bank 11	82.49	85.60	66.33	60.36	stable credit institution
Bank 12	43.62	48.02	54.11	41.14	stable credit institution
Bank 13	40.55	39.54	42.40	38.41	bank with balanced financial stability
Bank 14	46.24	54.38	52.99	50.21	stable credit institution
Bank 15	28,65	43.63	30.77	32.46	relatively unstable credit institution
Bank 16	35.35	35.43	36.12	43.56	bank with balanced financial stability
Bank 17	41.81	38.92	36.25	43.76	bank with balanced financial stability
Bank 18	47.87	42.37	27.02	38.87	bank with balanced financial stability
Bank 19	59.19	50.29	50.15	71.73	stable credit institution
Bank 20	33.31	32.54	37.70	37.98	bank with balanced financial stability
Bank 21	33.19	63.24	31.52	30.35	bank with balanced financial stability

We had predicted financial stability of regional banks of the Republic of Tatarstan for the next 3 years, using results of approbation of indicative model of assessment of banks financial stability, with application of the exponential trend based on nonlinear link between result of supervision and the time in which this supervision was recorded. As we can see in graphs in Figures 3-5 which present the results of forecasting, in 2013-2015 the values of financial stability indicator for stable banks and banks with balanced stability have mainly positive and insignificant negative trends while the group of relative unstable banks has steady downward tendency indicating the need of measures to prevent total loss of banks stability.

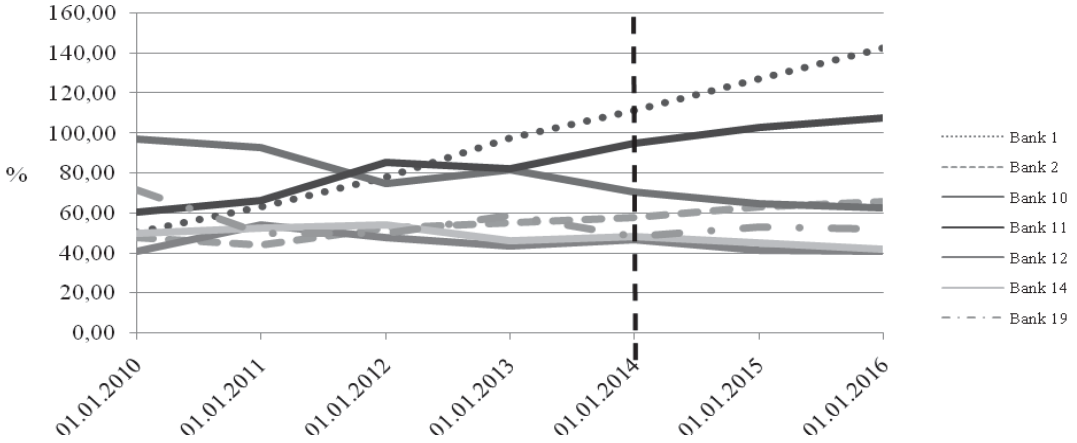

Fig. 3. Forecast of financial stability indicator for stable banks [Bank of Russia, 2014]

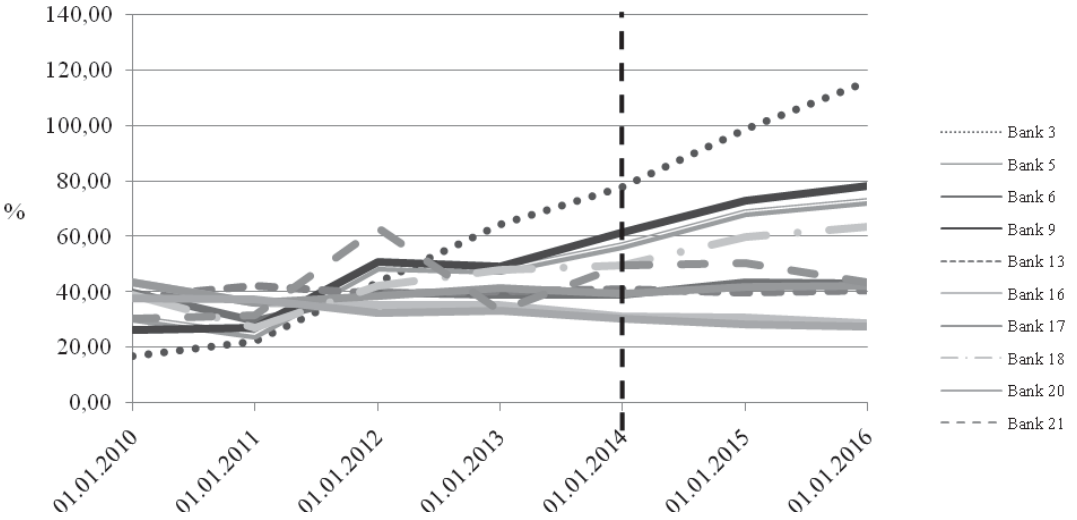

Fig. 4. Forecast of financial stability indicator for banks with balanced financial stability [Bank of Russia, 2014]

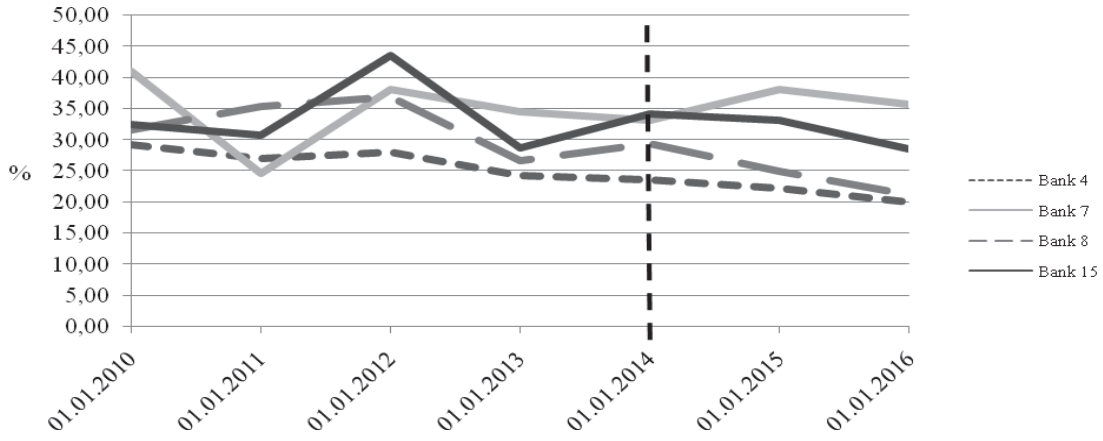

Fig. 5. Forecast of financial stability indicator for relatively unstable banks [Bank of Russia, 2014]

Summarizing the results of analysis of financial stability of regional banks we can make up a conclusion about relative stability of the banking sector of the Republic of Tatarstan. However banks relating to the group of stable banks and banks with balanced stability have negative tendencies which can lead to loss banks stability in medium term that confirms need of continuous monitoring and diagnostics of banks financial stability for timely neutralization of destabilizing tendencies.

Conclusion

Use of credit organizations assessment indicative model (includung regional banks) financial stability on a constant basis both by credit organizations and supervisory authority, will allow not only to reveal the problems in the activities of commercial banks, but also to take timely measures for their elimination, to reveal opportunities for increasing of financial stability, to compare the situation with banks-competitors that finally will lead to banks stability and will create conditions for banking sector stable development.

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