Performance Evaluation of Lending Instruments Within the Interaction of Banking and Construction Economy Sectors

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Abstract: Basic indicators of construction sector lending in the Russian Federation at the modern period were analyzed, factors impacting the dynamic of overdue loans volume, quantitative and qualitative indicators used for performance evaluation between banking and construction sectors were determined by researchers in the study. An attempt to estimate the volume of overdue loans in loan portfolio of Russian banks by the activity 'Construction' for the short-term was made with the help of Mathematical Modelling in Economics.

Key words: Real sector, construction sector, interaction of banking and real sectors, integration of real and banking sectors, performance evaluation between banking and construction economy sectors

INTRODUCTION

Construction industry is one of the leading real economy sectors in many countries. The state of the industry, its interaction with other real economy sectors in many respects determines innovative development of the country in general. Efficient interaction of banking and construction sectors is the foundation to ensure the successful development of the economy, one of the most strategically important contemporary challenges facing the Russian Federation. Its resolution allows multiplying the intensity of all economy sectors development in modern Russia. It is necessary to explore deeply, analyze, comprehensively and thoroughly investigate the features of banking system and construction industry interaction to resolve this issue.

In modern economic literature a number of national researchers as Ye.M. Sokolova, S.A. Husainova, Yu.S. Maslenchekov and A.M. Tavasiyeva have been engaged in the resolution of this problem. Their scientific works definitely made a contribution in the studying of this problem, however from our point of view current the economic state of Russia, possible changes in world economy issue new challenges in front of the banking system of the Russian Federation and construction industry as one of the leading elements of real economy sectors. This causes the need to expand the range of research in this area. The study is devoted to this issue.

MATERIALS AND METHODS

The research was carried out with the help of general scientific and private methods and techniques, especially the dialectical and evolutional method of economic phenomena and processes studying in their constant development. This method allows identifying relevant patterns, formal and logical methods, methods of system approach, abstract and logical, economic and mathematical, structural and functional and comparative analyses, methods of comparison and groups and others.

RESULTS AND DISCUSSION

By the efficiency of interaction between banking and construction sectors we understand the ratio of funds, provided by banking institutions for lending the construction companies to the efficiency of their further use as well as the amount of debt encumbering borrowers of the construction sector. Therefore, when evaluating the efficiency of interaction of these economy sectors of the Russian Federation, it makes sense in our opinion to use the specific weight indicator that is calculated by Eq. 1:

$$d = m_i/M \qquad (1)$$

Where:
m_i = Volume of studied part of the aggregate
M = Total volume of studied aggregate

On the basis of this formula the lending indicators of the construction industry of the Russian Federation in 2009-2013 years presented in Table 1 were calculated by us.

Analyzing the indicators listed in Table 1 it can be drawn a conclusion that the efficiency of banking and construction sectors interaction of the Russian Federation is deteriorated.

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Table 1: Relative indicators of construction industry lending of the Russian Federation in 2009-2013 years in percentage terms

Indicators	2009	2010	2011	2012	2013
Specific weight of loans provided by the activity "Construction" in the total amount of provided loans	5.03	5.86	5.72	5.97	6.74
Specific weight of past due debts by the activity "Construction" in the total amount of past due debts	9.67	11.31	10.36	9.16	9.36
Specific weight of debts by the activity "Construction" in the total amount of debts in the Russian Federation	8.62	9.13	8.73	8.39	8.12

Composed by researchers on the basis of Anonymous (2013b), Center for Macroeconomic Analysis (2013), Central Bank of the Russian Federation (2014) and Federal State Statistics Service (2014)

Table 2: Correlation matrix of the efficiency indicators of lending construction industry in 2009-2013 years

Identifiers	Symbols	Past due debt	The interpretation of qualitative properties of correlation relationship
GDP at current prices (bln. roubles)	x_1	0.68352	GDP growth in the country has a significant impact on the indicator of past due debts of construction organizations of the Russian Federation
Volume of lending by the activity 'construction' (bln. roubles)	x_2	0.6118	Expansion of lending volumes causes significant changes in the quality of loan portfolio
Average credit interest rates in (%)	x_3	0.3601	Increase of average credit interest rates practically has no effect on the indicator of past due debts
Fixed capital investment by the activity 'construction' (bln. roubles)	x_4	0.7422	Growth of past due debts is caused by the increase of investment in fixed capital of construction organizations
Amount of work completed by the activity 'construction' (bln. roubles)	x_5	-0.3624	Growth of finished construction objects entails the reduction of past due debts
Number of active construction organizations, (units)	x_6	0.7576	There is a high dependence of past due debts on the growth of active construction organizations
Average prices at primary housing market (roubles m^{-2})	x_7	0.8893	There is a high relationship with past due debts caused by the appreciation of real estate

Composed by researchers on the basis of Centre for Economic and Financial Research (2012), Central Bank of the Russian Federation (2014), Institute for Complex Strategic Studies (2013) and Expert RA Rating Agency (2013)

Volumes of past due debts in the loan portfolio of banking sector of the Russian Federation by the activity 'Construction' in 2009-2010 years had been increasing rapidly under the influence of numerous external and internal factors which directly or indirectly have had an effect on a performance result of banks as a whole. Therefore, the issues of predicting the level of past due debts in banks loan portfolio continue to be relevant. To achieve the goal let's conduct an economic study on the basis of correlation and regression analysis of the dependence of such indicator as the volume of past due debts by the activity 'Construction' in loan portfolio of Russian banks on different macro and microeconomic parameters. This modelling will identify the factors that determine the level and dynamics of past due debts share. In order to display accurate objectively existing economic processes substantial correlations will be identified and their quantitative assessment will be given as well as an attempt of casual relationships disclosure when the change of one factor is a consequence of changes in another will be made. Modelling will be carried out with the help of application software product Gretl.

At the initial stage, we will identify the factors that influence the dynamic of volume of past due debts indicator by the activity 'construction'. Eight main factors were determined:

- GDP at current prices (bln. roubles)
- Volume of lending by the activity 'construction' (bln. roubles)
- Average credit interest rates in (%)
- Fixed capital investment by the activity 'construction' (bln. roubles)
- Amount of work completed by the activity 'construction' (bln. roubles)
- No. of active construction organizations (units)
- Average prices at primary housing market (roubles m^{-2})

Sampling was carried out and source database was formed for the period from 2009-2013 by month, based on the banking statistics presented on the web-site of Central Bank of the Russian Federation (2014) and macroeconomic statistics presented on the web-site of Federal State Statistics Service (2014).

It was necessary to conduct a correlation analysis in order to determine the parameters that influence the efficiency of financing the construction sector of the Russian Federation by credit institutions.

There is a correlation matrix of the efficiency indicators of interaction between banking and construction sectors of the Russian Federation presented in Table 2 for the period from 2009-2013 years. The dependence (direct/inverse, strong/weak) of the selected identifier on parameters was determined with the help of calculated correlation coefficients. Chaddock scale was applied to estimate the correlation ratio.

Close interfactor correlation of x_2 and x_7 factors should be noted. Thus, we have constructed two models which both contain one of these factors:

- Dependence of y on x_1, x_2, x_3, x_4, x_5, x_6
- Dependence of y on x_1, x_3, x_4, x_5, x_6, x_7

We have analyzed the data of the model and concluded that the model 'dependence of y on x_1, x_2, x_3, x_4, x_5, x_6' possesses the highest performance. However, analyzing the significance of coefficients according of student's t-statistics we have determined that the coefficient x_4 (fixed capital investment by the activity 'construction' (bln. roubles) appeared to be insignificant. Therefore, we constructed a similar model excluding these factors: a model 'dependence of y on x_1, x_2, x_3, x_5, x_6'.

In general, the model proved to be significant. Determination coefficient was 0.92451 that means the factors included in the model explain the dependent variable by 92.45%. Analyzing model significance according to Fisher's test, we have concluded based on the p value (F) = 1.69e (12) that the model is significant in general on all levels of significance. At the same time, all the coefficients of the factors included in the model were significant by student's test, based on the p values. Thus, analyzing all the models, we have concluded that the model 'dependence of y on x_1, x_2, x_3, x_5, x_6' possesses the highest performance:

$$Y = 71.267 + 0.009212\, x_1 + 0.092476\, x_2 +$$
$$7.043815\, x_3 - 0.07254\, x_5 - 0.00254\, x_6 \qquad (2)$$

Practical significance of the constructed equation is that analyzing and controlling the parameters included in the equation as independent variables using constructed equation it is available not only to assess the amount of past due debts by the activity 'construction' but predict it for the future prospects.

Let's, predict the volume of bad past due debts in banking sector of the Russian Federation for the nearest three years applying the method of extrapolation, i.e., the spread of established in the last trends for future.

The indicator of the volume of the provided loans was calculated based on the assessments of banking experts as well as on the basis of the trend in recent months and optimistic expectations. Average credit interest rates were predicted based on the official data presented on the websites of the Central Bank of the Russian Federation and the Centre for Economic and Financial Research. In order to establish the predictive values of GDP at current prices, amount of work completed by the activity 'construction' and a number of active construction organizations, we have used official websites of the Federal State Statistics Service and the Institute for Complex Strategic Studies.

Substituting projected data in the regression Eq. 1, we have received the following projected values of past due debts volume in loan portfolio of banking sector of the Russian Federation by the activity 'construction', presented in Fig. 1.
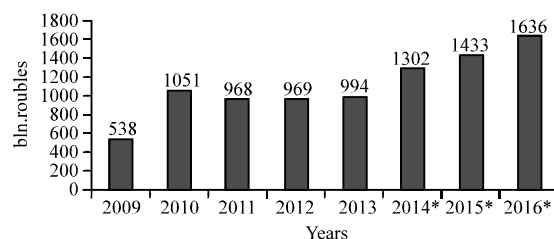

Fig. 1: Volume of past due debts in loan portfolio of banking sectors of the Russian Federation by the activity 'construction' in 2009-2016 years (bln. roubles) calculated by researchers on the basis Table 1

Summary: Analysis of performance evaluation of banking and construction sectors interaction in the economics of the Russian Federation makes it possible to draw the following conclusions.

In the last 2 years the banks have been stimulated the lending of the construction sector of the Russian Federation that is caused by the number of interdependent reasons: credit institutions need to place temporary surplus funds for the highest possible long periods, construction sector meets these requirements in case of a high level of financing and in turn satisfy its needs in financial resources.

Development of the construction sector of the Russian Federation depends of internal and external factors, namely: GDP at current prices, lending volumes, average credit interest rates, amount of work completed by the activity 'construction', total number of active construction organizations at the territory of the Russian Federation, global infrastructure events (Universiade, Olympic Games), world economy rebound.

Calculated indicators of the volume of past due debts in the loan portfolio of Russian banks by the activity 'construction' showed that they will be growing in the next three years.

CONCLUSION

Thus as a result of Mathematical Modelling in Economics by correlation and regression analysis the possible growth trend of past due debts volume in loan portfolio of Russian banks by the activity 'construction' has been found. Conducted analysis showed that the volumes with past due debts have volatile dynamics, depending on the internal and external factors as GDP of the Russian Federation at current prices, lending volumes, average credit interest rates, amount of work completed by the activity 'construction' and a number of active construction organizations at the territory of the Russian Federation.

RECOMMENDATIONS

As a recommendation for the increase of interaction efficiency between banking and construction industries, we can give the following suggestion.

Creation in the Russian Federation the reliable models of borrowers creditworthiness assessment (Vagizova, 2010; Vagizova and Selivanova, 2014), efficient system of internal monitoring of banks in order to increase their loan portfolio, speed boosting of decision-making on loans granting for particular project as a result of modern automated systems implementation that use up-to-date algorithms of data processing.

Increasing the transparency of decision-making of loans granting, ensuring the independence of decisions made on loan granting, increasing the efficiency of preliminary, current and subsequent monitoring in banks (Seredyuk, 2014).

Application of concession plans will allow the state to pass largely the investment load to private investors while maintaining the state control for the overall development strategy of the construction sector.

Creation in the Russian Federation large multi-industry construction companies that will ensure the full range of construction works, simplification the procedures of participation in tenders at regional and national levels with a prerequisite for the establishment of minimum limits on statutory capital of construction companies at least 50% of the project cost submitted for tender (Anonymous, 2013).

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