

External Risk Factors Influence on the Financial Stability of Construction Companies

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Abstract: The modern conditions of construction companies' activities in Russia are influenced by various processes: developing globalization, limitation of free trade due to economic sanctions, man-made disasters growth, worldwide digitalization, constantly evolving technologies. The purpose of this study is to develop a model for assessing risk factors' impact on the financial stability of construction companies using regression analysis based on dependencies between risk factors and financial stability of construction companies on the basis of statistical data over the past 10 years. The following methods were used: questioning of owners and key employees in construction companies on the indicators choice that characterize external risk factors, correlation analysis, regression analysis, expert evaluation method, trend line method. As a result it was revealed that in order to create favorable conditions for the construction companies' growth, a stable legislative base, a stable ruble rate and an activation of investments in fixed assets are needed. The proposed tool for assessing external risk factors and their impact on the construction companies' financial sustainability can be used both to assess the organization's environment and to assess various risk situations in order to further use the results in decision-making.

Keywords: Financial stability, constraint companies, risks.

INTRODUCTION

The current conditions for the financial and economic activities of construction organizations in Russia are influenced by various processes, including: developing globalization, free trade limitation as a result of constantly increasing economic sanctions, growing global and domestic competition, intensifying investment activities, both at the regional level, the country level and on the global scale, man-made disasters growth, universal digitalization and constantly evolving technologies.

Since the end of the 20th century to the present time in the world practice and science there is a search for modern methods for effective management of company's corporate finance. This process is determined by the need to improve companies' financial stability and rapid adaptation to modern and constantly changing conditions of management, self-transformation and self-adjustment. The most relevant for the Russian construction business this problem has become in the last decade.

The main reason for this trend is that Russian construction companies, which are developing now not

so fast, in the process of managing corporate finances and assessing financial stability, as well as identifying the factors affecting it, do not fully take into account the specifics of the new economic situation, which significantly changes the business environment of modern organizations and itself, in turn, is determined by the development of globalization, world-wide digitization, the activation of innovation, the increased role of intangible assets in the cost of construction of business. As a result of these changes, which speed is growing rapidly, the risks are connected not only with the complexity of production processes and the sale of services, but also with the search for new directions for business development and the development of strategy for improving the financial stability of the organization. All this determines the need to change priorities in methodological approaches to increase the financial stability of construction companies that will take into account environmental risks.

In this regard, the actual issue is the formation of a methodological approach and tools for managing and assessing the construction company's stability that reduces vulnerability to growing external threats by assessing the environmental risk factors impact on the financial stability of a construction enterprise that can cause a risky event and have a negative impact on the company's activities as a whole. In this regard, the actual issue is the formation of a methodological

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approach and tools for managing and assessing the construction company's financial stability that reduces vulnerability to growing external threats by assessing the impact of environmental risk factors on the construction company's financial stability that can cause a risky event and have a negative impact on the company's activities as a whole. In this regard, the actual issue is the formation of a methodological approach and tools for managing and assessing the construction company's that reduces vulnerability to growing external threats by assessing the impact of environmental risk factors on the financial stability of a construction enterprise that can cause a risky event and have a negative impact on the activities of the organization as a whole.

The external environment of economic entities can be characterized as heterogeneous and numerous in structure. Consequently, it includes a large number of components that have varying in degree, nature and periodicity impact on the financial stability of organizations. In this case the question of the methodology for assessing the external risk factors of construction company and their impact on its financial stability is relevant.

Among the scientists who examined the problematic aspects of the theory and methodology of enterprise financial stability, the following scientists can be named: Eskindarov and Fedotova (2016), Filatova, Orekhova and Brusov (2017), Rjachovskaya and Kovan (2017), Korneeva and Rusakova (2016), Shokhin (2015), Antonov (2015), Gribovsky (2015), Kovalev (2015), Lyubushin (2015), Melnik (2015), Plotnikov and Plotnikova (2015), Endovitsky and Pozhidaeva (2014), Bakanov and Sheremet (2012), Molibog (2011), Pyastolov (2002), Bennett (1991).

Financial stability and solvency can be attributed to the most important indicators of the construction company's financial and economic activities that operates in a market economy. If the activity of an enterprise can be characterized as financially stable and solvent, then it has certain advantages relative to other enterprises operating in the same segment of a market economy. These advantages include the possibility of attracting investments, obtaining favorable loans, selecting more qualified personnel and even choosing suppliers and customers.

It should be noted that earlier, when conducting a financial analysis of the organization's activities, attention was focused on the introduction of various

limits, reserve funds, working capital normative, and one of the most important indicators of the financial condition of the enterprise was profit (Bakanov and Sheremet 2012). At the present time, such an approach to assessing the financial condition of a construction organization is not indicative, as in the current economic environment, in the face of economic sanctions and the instability of financial markets, construction companies seek solvency, stability, financial stability, development, which is possible only through the use of modern methods evaluation and analysis of corporate finance.

To date, there are many methods and models for assessing the financial condition of construction companies, but the main problem is that most of them belong to Western authors, adapted to Russian realities. The best known and currently popular models for assessing the financial stability of an enterprise are mostly unified. Their central link is the normative indicators of analytical coefficients (Korneeva and Rusakova 2016).

However, the specifics of the sphere and the field of management of construction companies are able to exert a significant influence on the indicators' normative values, because in accordance with the company's activities structural changes in the composition of the funds and the sources of their formation can be reflected in its balance sheet. Therefore, it is important to form and introduce new methods and models for assessing the financial stability of construction company's that will be able to take into account their industry specificity and the nature of the Russian economic conditions of business (Shokhin 2015).

The financial sustainability of a modern construction company is affected by a large number of various factors of the external and internal environment. All these factors can be divided by the reasons for the emergence, by time indicators, by the degree of influence on the activities of the organization, by the importance of the result to the main and secondary, by the structure of simple and complex, by the time actions on permanent and temporary (Rjachovskaya and Kovan 2017, Pyastolov 2002) etc.

The purpose of this study is to develop a model for assessing the risk factors impact on the financial stability of construction companies using regression analysis by establishing dependencies between risk factors and financial stability of construction companies based on statistical data over the past 10 years.

METODOLOGY

Following the system approach in the research process, methodological approaches to assess the companies' external risk factors were identified.

Assessment of external risk factors in the study was carried out using quantitative methods. In the course of the analysis, the following groups of companies' environmental risk factors were investigated: economic, political, socio-demographic, international and technological, due to the results of which construction companies may experience a decrease in financial stability.

External risk factors' evaluation and their impact on the financial stability of construction companies included several stages:

- (1) definition of groups and environmental risk factors of construction companies (determined by expert advice based on a reasoned judgment);
- (2) choice of indicators that most fully characterize the external risk factors of construction companies (also identified expertly);
- (3) choice of the resulting indicator, which at the macro level is able to reflect the financial stability of construction companies;
- (4) quantitative values' collection of environmental risk factors indicators from various sources and their primary processing;
- (5) correlation model construction and obtained correlation dependencies analysis;
- (6) key environmental risk factors identification for organizations that affect the financial sustainability;
- (7) construction a regression model of the effect of external risk factors on the construction company's sustainability (in constructing the regression model, the specific weight of construction companies was chosen as the resultant index, which increased their financial stability in the total number of construction organizations studied within three years);
- (8) regression model analysis and check it for representativeness;
- (9) development a forecast of changes in external strategic risk factors for three years;
- (10) forecast growth or decrease in the number of financially sustainable construction companies, in accordance with the forecast of changes in external risk factors;
- (11) writing conclusions and recommendations on the results of analysis and forecast.

RESULTS

As a result of the external risk factors analysis by the method of pair correlation, it was revealed that the state and dynamics of financial stability the indicator for construction companies in Russia depends largely on the following factors:

- (1) frequency of changes in the legislative base (measured in the number of legislative acts adopted during the year), pcs.,
- (2) investments in fixed assets, billion rubles,
- (3) US dollar rate, rub.

Based on the results of the correlation analysis, it follows that the existing external environment is characterized by the growth of these factors and adversely affects the financial stability of construction companies and this is evidenced by the trend that has developed after 2014. However, the growth of investments in fixed assets in 2012 and 2013 favorably influenced the increase in the share of financially sustainable construction companies in the total volume of construction organizations surveyed.

As a result, a working hypothesis was put forward that the growth of the share of financially sustainable construction companies is adversely affected by the growth in the frequency of changes in the legislative base and the growth of the US dollar, and investment in fixed assets can have a positive impact.

To confirm the proposed working hypothesis, a regression model was constructed.

Environmental factors analysis in the external environment of construction organizations in the regression model allowed us to determine the trends of external risk factors and build a real model of the relationship between external risk factors and construction companies' financial stability in the form of formula (1):

$$Y = 17,84 - 0,26X_1 + 0,00087X_2 - 0,22X_3, \quad (1)$$

where X_1 – frequency of changes in the legislative base, pcs.;

X_2 – investment in fixed assets, bln. rub.;

The regression model that characterizes the mutual influence of the above risk factors includes only three environmental risk factors for organizations that affect the financial sustainability of domestic construction companies. At the same time, the growth of investments in fixed assets exerts a favorable influence, and the growth of the US dollar rate and the frequency of changes in the legislative base is unfavorable, which confirms the hypothesis put forward.

The strategy of growth of financial stability of construction companies is largely determined by the scenario of changes in the external environment of its activities. Based on the results obtained, it is proposed to forecast the number of financially stable construction companies for three years ahead by constructing trend lines using various methods (linear, logarithmic and polynomial) widely used in economic forecasts (Puchkov 2011).

The criterion for selecting the result was the approximation coefficient R^2 for each of the methods.

For factor 1 in the third year of the forecast:

when constructing a logarithmic trend line

$$X_1 = 16,862\ln(n)+5,544 = 48,794$$

$$R^2 = 0,786;$$

when constructing a linear trend line

$$X_1 = 4,273n+4,3 = 59,849$$

$$R^2 = 0,872;$$

when constructing a polynomial trend line

$$X_1 = - 0,0088n^2+4,524n+4,7052 = 62,03$$

$$R^2 = 0,916.$$

Proceeding from the maximum value of the approximation coefficient (0.916), you should choose the result obtained with the help of the polynomial trend line, which is equal to $X_1 = 62,03$.

Similarly, we calculated for the other two factors:

- for factor 2, the forecast was also obtained using the polynomial trend line $X_2 = 16\ 890,45$ ($R^2 = 0,9801$);
- for factor 3, the forecast was also obtained using the polynomial trend line $X_3 = 61,68$ ($R^2 = 0,7919$).

The results of the forecasted data on the external risk factors of construction organizations for three years are presented in Table 1. Next, we will make a forecast calculation of the financially sustainable construction companies share based on the predicted values of external risk factors by the formula 1. The results of the calculations are presented in Table 1.

As a result of the calculations, it should be concluded that if the trend of the external indicators development continues, namely, changes in the legislative base will occur more intensively, the ruble / dollar exchange rate will increase, then the share of financially stable construction companies will decrease. Regarding investment in fixed assets of enterprises, it is worth noting that despite the fact that they both show growth according to the results of the analysis and the results of the forecast, however, these growth rates are insufficient to increase the financial stability of construction companies. Consequently, favorable conditions for the growth of constraint companies'

Table 1: Forecast of Changes in External Risk Factors and the Share of Financially Sustainable Construction Companies in the Total Number of Construction Organizations Surveyed

Factor's title	Forecast period		
	1 st year	2 nd year	3 ^d year
X_1 – frequency of legislative changes, pcs.	53,40	57,73	62,03
X_2 – investment in fixed assets, billion rub.	15370,54	16023,31	16890,45
X_3 – the ruble to the US dollar ratio, rub.	57,91	60,02	62,68
Y – number of financially sustainable construction companies	4,59	3,57	2,62

financial stability are a stable legislative base, a stable ruble rate and activation of investments in fixed assets.

CONCLUSION

The proposed methodology for assessing the external risk factors of construction companies is based on the analysis of statistical data over a ten-year period and their forecast based on these data using the methods of the trend line.

As a result of the study, the main environmental risk factors that maximally affected the financial sustainability of construction organizations were identified, and a working hypothesis was confirmed that an increase in the performance of individual external risk factors does not always have a negative impact on the financial stability of construction companies. Negative impact of the ruble to the US dollar growth and the growth of the frequency of changes in the legislative base, and the growth of investment in fixed assets have a positive impact. However, the investment activity that exists at the moment is not sufficient to increase the financial stability of construction companies.

The originality of the proposed methodology is that the proportion of construction companies was selected as the resultant indicator, showing the growth of financial stability during a three-year period in the total number of construction organizations surveyed. The growth of construction companies' financial stability can only be provided if there is a favorable external environment and the identified external environmental risk factors are minimal. Consequently, in this case, the share of financially sustainable construction companies is an indicator of the external environment state: if their number decreases as a result of some factors influence, then the environment is unfavorable if it grows, then the state of the environment is favorable.

Thus, the results of the study made it possible to obtain a characterization of the external risk environment in the current period for all domestic

construction companies. The proposed tool for assessing external risk factors and their impact on the financial sustainability of construction companies can be used both to assess the organization's environment and to assess various risk situations in order to further use the information obtained in decision-making.

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