Creation of Corporative Financial Stability Index: Integrated Approach

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Abstract: At the present time it is customary to consider the financial stability in the macroeconomic aspect. The existing methodology of its assessment covers mainly the financial market. At the same time, due attention is not paid to companies operating in the real sector of the economy. This paper proposes a methodology for developing indices of financial stability of companies, which allows to take into account both qualitative and quantitative assessment of relevant factors. Its elements and principles of construction are formulated, factors and indicators are defined, as well as methods and approaches to their evaluation. The main directions of its development and application are shown. The proposed approach and the developed methodology can be in demand by representatives of public administration in justifying a wide range of management decisions that require an assessment of financial stability. It may also be of interest to market participants, including relevant institutions, investors and companies attracting investments.

Keywords: Methodology, financial stability, indicators of financial stability, modelling, valuation.

INTRODUCTION

The functioning of enterprises and corporations in rapidly and often spontaneously changing socio-political and economic conditions certainly affects their financial stability. At the same time, the current toolkit for assessing financial stability has been partially developed only at the macro level. Existing methods and approaches to its evaluation cover mainly the financial, banking sector and insurance market. In addition, not enough attention is paid to the companies operating in the real sector of the economy, which constitute its foundation. However, they are also subject to crises, just like financial markets, banking and insurance institutions. In this regard, the development of approaches to assessing financial stability at the micro level is an urgent task, the solution to this problem will largely contribute both to improving the efficiency of the economy as a whole and the sustainability of its individual sectors.

The evaluation of the financial stability of enterprises in the real economy requires a non-parametric approach, since data on the financial condition of business entities, including closed companies, does not fully meet the requirements for the use of statistical models. At the same time, the liquidation of enterprises, including liquidation through bankruptcy, is regulated by the state legislation, and its mechanisms and procedures are clearly explained in the legislation.

An effective approach to solving this problem is the development of an index of financial stability of enterprises.

LITERATURE REVIEW

The variety of goals and objectives of financial stability research and evaluation leads to ambiguous definitions. Critical rethinking of relevant issues and systematization of possible answers create new opportunities for developing the concept of enterprise financial stability, mutually enriching different methodological approaches and directions. Research in this area allows us to note at least two problems that critically affect the quality of scientific communication in this field.

Firstly, the approaches to determining the financial stability and financial sustainability of enterprises are not clearly defined, which is an inevitable consequence of the relationship between the categories of “stability” and “sustainability”, which, in particular, manifests itself in the definition of such terms as “instability”, “stabilization”, “stable equilibrium”.

Secondly, the development of macrofinance analysis is to some extent autonomous in relation to the theory and practice of microfinance analysis.

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In the context of *macrofinance* analysis, the category of "*financial stability*", which is considered as one of the most important characteristics of financial systems, is a system-forming concept of the analyzed problem (Mishkin 1979; Allen and Gale 2004).

As Alawode and AlSadek (2008) showed, the interpretations of financial stability are divided into two main types:

1. *assertive* or *functional*, the main focus of which is on the ability of the financial system to perform its functions stably;

2. *denying* or *situational*, according to which the content of financial stability is identified by the method of opposing financial instability, which requires the study of different financial situations - the states of the financial system.

Studying the content of the category "financial stability" for the macrofinance analysis purposes, it should be noted that the stability of the financial sector of the economy ("financial stability"), as a rule, is separated in its meaning from the financial stability of the real sector ("enterprises"). Thanks to numerous empirical studies (Adrian, Covitz and Liang 2017), the mutual relationship between the stability of the financial and the real economy is unquestionable, which explains the existence of a section devoted to enterprises in certain methods of monitoring financial stability. At the same time, the nature of the relationship between the stability of the financial sector and the financial stability of enterprises is perceived ambiguously.

Quite often, the stability of financial markets and financial institutions is seen as a predictor of financial stability of enterprises (Alawode 2008). At the same time, an inverse relationship has been revealed: the financial stability of enterprises affects the stability of the financial sector, and in this connection it is necessary to mention the studies of I. Fischer (1933) and H. Minsky (1979).

We also take into account that in the context of macrofinance analysis, including in terms of enterprises, the collocation "financial stability" prevails. In addition, the term "financial sustainability" (or "sustainability of the financial system") is often used in the same meaning.

A number of authors suggest separating these categories, but a unified position on this issue has not been worked out. At the same time, as the analysis of methodological approaches to the evaluation of financial systems shows, the term "financial sustainability", as a rule, applies to certain aspects or indicators of financial stability[1].

For example, the basis of monitoring the global financial stability of the International Money Fund (IMF) is a system of indicators of *financial sustainability*.

Similarly, we can talk about the indicators of financial sustainability of enterprises, which refers us to the terminology of microfinance analysis.

In the context of *microfinance analysis*, the term "financial sustainability of enterprises" prevails, the content of which is disclosed through the system-forming categories "*financial/ capital structure*" and "*financial risk*".

The financial structure, that is, the aggregate and combination of sources of financing for the enterprise (Van Horne and Wachowicz 2008; Damodaran 2014), in this case can be considered as optimal or acceptable, which allows us to classify approaches to the definition of financial sustainability, identifying the main debatable issues in this area.

First of all, the content not only of the optimal (Brigham *et al*. 2017), but also of the acceptable financial structure of the enterprise is ambiguously perceived. The latter can be interpreted from the standpoint of the interests of different persons: on the assumption of liquidation – it is in the interests of *creditors* for long-term and short-term debts, on the assumption of continuing operations – for the benefit of *capital providers*, which in this context is associated with long-term sources of financing, including equity financing.

Accordingly, the choice of key indicators of financial sustainability of enterprises is also ambiguous. If we are talking about interpretation from the position of creditors, priority is given to the relative size of equity and the level of coverage of constant financial expenses (Bodie *et al.* 2014). If financial soundness is interpreted from the perspective of investors, a sufficient level of coverage of the total financial costs of servicing the company's capital becomes the most essential.

[1]Special attention in this respect should be paid to *the concept of sustainable development*, in the context of which the term "financial sustainability" seems preferable.

The financial sustainability approach based on the optimal financial structure can be considered *analytical*, while an alternative approach, often not requiring the modeling of a financial structure, by analogy, is *heuristic*. However, such an analogy is somewhat incomplete, because the "optimality" of the financial structure is evaluated in relation to the value of the enterprise, while "acceptability" is interpreted with respect to financial risk.

In this regard, we should note that mainly the indicators of financial sustainability correspond precisely with the task of assessing financial risk, which is an indirect sign of the predominance of the second concept; and in foreign sources, instead of the term "financial sustainability", the term "long-term solvency" is most used, and, therefore, the main attention is paid to the information interests of creditors (Brigham 2017; Palepu *et al*. 2007).

Summarizing all the points mentioned above, we should draw attention to the fact that the scientific notions of financial stability and financial sustainability of enterprises leave many unresolved issues and they require integration based on a single harmonized idea.

Such idea – the concept of financial stability proposed by Lukasevich and Lvova (2017).

METHODOLOGY

Further, the development of the financial stability index within the framework of the proposed approach will be based on the following basic assumptions:

1. stability acts as one of the key characteristics of the financial system, which predetermines the need to assess the conditions of its functioning in order to justify the indicators of financial stability of enterprises;

2. the level of financial stability of the financial sector is interconnected with the level of financial stability of the non-financial sector: financial instability of the financial sector adversely affects the financial stability of enterprises; in its turn, the financial instability of enterprises adversely affects the level of financial stability of the financial sector;

3. financial stability of an economic entity is characterized by an acceptable low probability of financial insolvency, and, on the contrary, the high probability of financial insolvency should be considered as a sign of its financial instability;

4. an acceptable low probability of financial insolvency, obtained from a representative sample of enterprises, positively characterizes the financial stability of the analyzed sector (accordingly, a decrease in the probability of financial insolvency positively characterizes the dynamics of financial stability);

5. high probability of financial insolvency of enterprises should be considered as a sign of financial instability of the sector (increasing the likelihood of financial insolvency negatively characterizes the dynamics of financial stability).

The methodology for compiling the index may include an estimate limited solely to financial indicators. However, given that in the economy of the Russian Federation, closed companies are predominant, such an assessment will be incomplete. In addition, it will not reflect the economic situation at the global, national and regional levels, the attitude of participants in financial markets, indicators of financial stability at the macro level, socio-political factors, etc.

Thus, according to the accepted theoretical assumptions, the methodology should be divided into two blocks:

- *qualitative assessment* of the financial stability of enterprises, obtained by the method of expert assessments;

- *quantitative assessment* of the financial stability of enterprises, obtained on the basis of aggregated financial reporting data using adapted models of financial insolvency forecasting.

RESULTS AND DISCUSSION

The qualitative assessment of the financial stability of enterprises should be done by the method of expert assessments, which presupposes offering to evaluate the possible answers on a seven-point scale), it will allow to more accurately generalize the obtained results.

It is advisable to invite the professional and academic community to participate in the survey, as well as representatives of government and regulatory bodies.

The questions should include an assessment of financial stability indicators, as well as a direct

assessment of financial stability in the analyzed period (Table **1**).

Comparable methodological approaches that involve a qualitative assessment of institutional, political and general economic conditions are traced in country risk monitoring techniques, and are also applicable in monitoring financial development.

The quantitative assessment of the financial stability of enterprises should be implemented on the basis of aggregated microeconomic data with the use of adapted models of forecasting financial insolvency. When choosing models for forecasting financial insolvency, the following principles should be followed:

1. the financial statements should be used as data source, which will facilitate the transparency of evaluation results;

2. it is desirable to combine conceptually different methodological approaches by providing an assessment of the direct and indirect signs of financial insolvency, which should provide more feasible conclusions;

Table 1: Methodology of Quality Assessment of the Enterprise Financial Stability†

№	Questions	Points	Possible evaluation factors
Q_1	Assess the impact of institutional conditions on the financial stability of enterprises in the analyzed period	1-7	Quality of legislation and law enforcement in relation to business
			Burden of state regulation of business
			Quality of contractual discipline
			Level of corporate governance
			Assess additional factors
Q_2	Assess the impact of political conditions on the financial stability of enterprises in the analyzed period	1-7	Geopolitical factors of financial stability
			Regional political factors of financial stability
			National political factors of financial stability
			Assess additional factors
Q_3	Assess the impact of general economic conditions on the financial stability of enterprises in the analyzed period	1-7	Investment activity
			Currency risk
			Price risk
			Interest rate risk
			Assess additional factors
Q_4	Assess the impact of financial conditions on the financial stability of enterprises in the analyzed period	1-7	Stability of financial markets and financial institutions
			The effectiveness of financial markets and financial institutions
			Financial depth
			Availability of financial resources to business
			Assess additional factors
Q_5	Assess the financial stability of enterprises in the analyzed period	1-7	Quality of loans and borrowings of enterprises
			Quality of accounts payable of enterprises
			Debt burden of enterprises
			Financial risk of enterprises
			Intensity of defaults and bankruptcies in the non-financial business sector
			Assess additional factors

Remarks

1 Possible answers should be assessed on a scale from 1 to 7, provided that 0 is the worst estimate (these conditions have an extremely negative impact on the financial stability of enterprises / enterprises are characterized by exceptionally financially unstable state), 7 is the best estimate (these conditions have a positive effect on the financial stability of enterprises / enterprises are characterized exclusively by a financially stable state).

2 Answers can be formed taking into account these factors, suggesting the possibility of a flexible choice of significant predictors and the way they are summarized by experts

†Done by the authors.

3. models should be universal in nature, which will ensure the reliability of the findings.

The conducted researches showed that it would be expedient to use the following models of forecasting financial insolvency.

The theoretical model of Z-accounts of organizations, which goes back to the studies of J. Boyd and S. Graham (1986), which is widely used in assessing the financial stability of banks, but it can also potentially be applied to non-financial companies:

$$Z = \frac{ROA + \frac{E}{A}}{\sigma_{ROA}} \quad (1)$$

where Z – the index of financial stability of enterprises (calculated for certain types of economic activities in accounting estimates), ROA - the average level of return on assets, calculated as the ratio of average net profit to average assets at the end of the analyzed period, E – average net worth at the end of the analyzed period, σ_{ROA} – standard deviation of profitability of assets for the analyzed period.

The Z-account formula is based on a theoretical model of financial insolvency. The latter in this case is seen as an excess of the value of assets over the amount of debt. The Z-account reflects the strength of the organization (or a group of organizations) in relation to financial results: in other words, to what level these results may decline until financial insolvency (financial crisis) occurs, and the estimated interval is presented in the number of standard deviations. Accordingly, the positive dynamics of the Z-account positively characterizes the changes in the financial stability of the analyzed enterprises, while the fall of the Z-account should be regarded negatively.

The empirical model of the Z''-account of E. Altman is designed to assess the likelihood of financial insolvency of organizations of different types of economic activity in the countries with different levels of development of the financial system (Mare *et al.* 2015) and, importantly, confirmed predictive accuracy in testing for a global sample of companies (Altman 2005). In our opinion, in order to assess the financial stability of enterprises, an adapted version of this model can be used, that is based, as in the previous case, on aggregated data on the analyzed sample (Altman *et al.* 2014):

$$Z'' = 6,56 * X_1 + 3,26 * X_2 + 6,76 * X_3 + 1,05 * X_4, \quad (2)$$

where Z'' – the indicator of financial stability (calculated for certain types of economic activity in accounting estimates at the end of the analyzed period), X_1 is the average share of own current assets (difference of current assets and short-term liabilities) in assets, X_2 is the average profitability of assets for the accumulated unallocated profit, X_3 – the average sample profitability of assets on sales profit, X_4 – the average sample of the ratio of equity and debt.

Thus, an increase in the Z'' account figures positively characterizes the dynamics of the financial stability of the analyzed enterprises, and, conversely, a decrease in the Z'' level should be viewed negatively.

In order to ensure comparability of the results of qualitative and quantitative evaluation of financial stability, the values of Z and Z'' for individual economic activities should be reduced to a seven-point scale, after eliminating emissions (leaving 95% of the figures):[2]

$$\tilde{K}_i = 6 * \frac{(K_i - K_{min})}{K_{max} - K_{min}} + 1, \quad (3)$$

where $\tilde{K}_i$ - the normalized value of the financial stability index for the i-type of economic activity, K_i – the value of the financial stability indicator for this type of economic activity, K_{min} – the minimum value of the financial stability indicator (for all types of economic activity), K_{max} – the maximum value of the financial stability indicator (for all types of economic activity).

Dynamic and comparative analysis of normalized quantitative indicators of financial stability by types of economic activity is of independent importance. However, the compilation of an index of financial stability requires an assessment of aggregate indicators:

$$\bar{K} = \sum_{i=1}^{n} (\tilde{K}_i * w_i), \quad (4)$$

where $\bar{K}$ – the average weighted value of the financial stability indicator, $\tilde{K}_i$ is the normalized value of the financial stability indicator for the i-economic activity, w_i is the share of total assets for this type of economic

[2] In this case, the linear normalization formula: $\tilde{K}_i = \frac{(K_i - K_{\min}) * (d_2 - d_1)}{K_{\max} - K_{\min}} + d_1$

где [d1; d2] – The interval to which the value of the financial stability indicator is given.

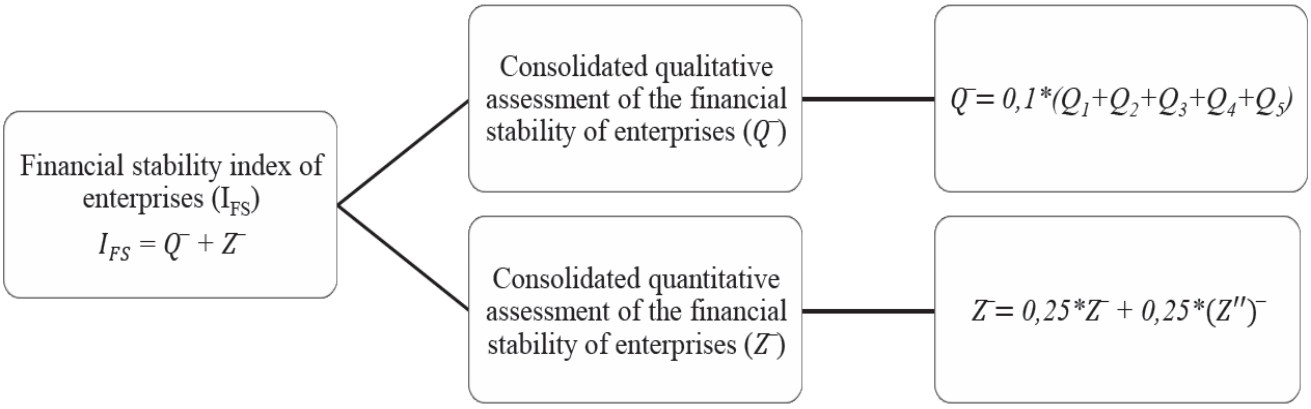

Figure 1: Methodology for assessing the index of financial stability of enterprises.
Prepared by the authors.

activity in the total volume of assets in the sample, n is the number of economic activities in the sample.

The evaluation of the enterprise financial stability index, in turn, is proposed to be carried out on a seven-point scale in the following way (Figure **1**):

This formula is based on the premise of the comparatively high importance of qualitative and quantitative assessment of the financial stability of enterprises, which predetermined the choice of the specific gravity of individual indicators. Positive dynamics of the index should be regarded positively, while the decrease of the index is an undesirable trend. In the future, the possible gradation of the index values for different types of economic activity is possible, which will require the organization of appropriate monitoring.

CONCLUSION

The theoretical significance of the proposed methodology is that it is based on the dialectical concept of assessing financial stability, which has made it possible to adapt the toolkit of corporate financial diagnostics. In addition, an index was first developed combining qualitative and quantitative approaches to assessing the financial stability of enterprises, whereas at present this assessment is mainly based on aggregated microeconomic indicators, as well as individual macroeconomic indicators.

The proposed methodology can be demanded by representatives of government bodies in substantiating a wide range of management decisions that require assessing financial stability. Of particular importance, this method seems to have in the context of macroprudential policy. At the same time, it will be of interest to financial market participants, including relevant institutions, investors and companies attracting investments.

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