Balance rapid test for assessing financial stability of an enterprize, improving the quality of economic assessments during the fourth industrial revolution

Chernenko Aleksey Fedorovich

1. South Urals State University
SUSU
Chelyabinsk, Russia
2. Ural state University of Economics
USUE
Yekaterinburg, Russia
2052@bk.ru

Abstract— **The article provides a reliable way to assess the indicator of rational use of enterprise resources - its financial sustainability, which improves the quality of substantiation of management decisions implemented by economics in the fourth industrial revolution. The article provides a critical assessment of existing methods for evaluating the financial stability of enterprises. The author has presented a method for assessing financial stability with the aim of eliminating a number of methodological contradictions, such as the presence of financial stability in an insolvent enterprise, assimilation of financial stability with current solvency, comparison of own and borrowed sources of assets formation and others. The developed balance rapid test for assessing the financial stability of an enterprise is based on an original approach with respect to similar methods, expressed in the condition of preserving the ability to continue economic activity in case of a simultaneous settlement of all obligations. This method does not associate the value of the company's own working capital with the amount of reserves, does not use the ratio of own and borrowed sources of the enterprise assets. The developed method requires a simple restructuring of the balance sheet to verify the criterion relationships, which determine the stability of the enterprise. The methodical simplicity of the balance rapid test for assessing financial stability gives grounds for its widespread use in analytical procedures.**

Keywords— balance method, financial stability, solvency, working capital, liabilities

I. INTRODUCTION

One of the tasks implemented by economics in the fourth industrial revolution is a radical increase of quality of the substantiation of managerial decisions. The solution to this problem will increase the efficiency of resource use. This is reflected in such an indicator of the result of economic activity, as the financial stability of the enterprise.

Proceeding from the semantics of the words, the financial stability of an enterprise reflects its ability to preserve the characteristics of a successful business activity in a changing external and internal environment. Therefore, this indicator is among the principle ones when analyzing the financial situation of the company. Many scientific articles are devoted to the interpretation of the term "financial stability of

an enterprise". At the same time, there are few known methods for assessing financial stability. This is accompanied by a conundrum: the same specific method for assessing an economic indicator (or a system of indicators) corresponds to different interpretations of what is being studied. Besides, speaking of the frequency of the terms usage, the term "financial stability" trails only the "financial solvency", but is not connected to it methodologically in any way (leaving out the opinion of the researchers, who prefer to associate the solvency and the financial stability). At the same time, such a connection must necessarily take place at least logically: for example, an insolvent company cannot have financial stability. However, calculations to assess the solvency of enterprises and their financial stability, according to the methods outlined in numerous educational and scientific literature, lead to precisely this (second) conundrum: an enterprise having acceptable solvency indicators may be financially unstable. It would be possible to assume such a result even without carrying out practical calculations, since the factors used in the assessment of solvency and financial stability according to all known methods are not functionally related. It follows that at least one of the methods mentioned (either assessing solvency or financial sustainability) is incorrect.

The author's position is that the definition (interpretation) of an economic indicator should directly indicate the method of its calculation. In this case, at least, the first of all the mentioned conundrums will be resolved: the method of assessing the indicator will correspond to its economic meaning.

II. LITERATURE REVIEV

There are numerous scientific articles devoted to the topic of assessment and analysis of the financial stability of an enterprise. Among the earliest of works that contain the methodological basis of financial stability evaluation the following are worth mentioning: [1, 2, 3, 4]. However, these works, as well as subsequent works of various authors, contains the description of the same methods and the corresponding calculations for the specific enterprises. In terms of the applied methods for studying financial stability

the few articles [5, 6] are considered to be exceptions. In these articles the financial stability is understood as the absence of prospects for bankruptcy, as it is defined by the formula of E. Altman [7]. Upon that, the authors of the articles [5, 6] do not take into consideration two circumstances:

1) coefficients in the models of E. Altman are acquired as the result of statistic monitoring of several dozens of enterprises, and the definition area of his model is restricted. Such restrictions are not indicated anywhere and the results of modeling can be spread on any enterprise. It is impossible to evaluate the credibility of the prediction since it concerns future events, and conclusions are drawn about the present;

2) there is no doubt that the economic environment influences the values of the coefficients of the model and it is not reasonable to apply the results on other economic (i.e. Russian) environment. The abovementioned circumstances allow to express doubts in credibility of the results, acquired with the help of this model [7].

There even are works, in which authors don't ponder over the diversity of methodologies and just take any of them without giving methodological justifications [8].

There are also works in which financial stability is associated with a constant ability to settle obligations [9]. In these works, analysis techniques and procedures are presented to ensure constant solvency. However, solvency and financial stability should not be identified, since "stability" is always associated with the ability to withstand any sudden external influences, and successful work without the readiness to withstand adverse conditions in business, although characterized by constant readiness for mutual settlements, does not mean "stability". In our work [10], this is substantiated in detail and a method for assessing solvency is proposed, which, is significantly different in its approaches not only from that given in [9], but also from others.

The doubts in credibility of the Russian techniques represented widely in Russian education materials arise because of the fact that they show a number of substantial weakness points: 1) the lack of logical connection between the definition of financial stability that the author uses in its work and the criteria system which he uses together with it; 2) the lack of any sound justification of the criteria indicator of values according to which the financial stability is determined or the lack of the criteria indicators themselves, and this fact gives the evaluation of the parameter in question a completely subjective characteristic.

Since there are a lot of articles containing the definitions of financial stability, it is possible to review only a couple of them.

For example, in article [11] and many others alike, the financial stability is understood as the gradual increase of the income over expenditures. For such a definition to correlate with the method of financial stability evaluation it is enough to study the dynamics of the different types of profits. At the same time it is obvious that the trend of the profit change alone does not define the stability of the activities in such an unpredictable and random environment as entrepreneurship.

In work [12], which is an extensive monographic study, the following definition of the financial stability is given – it is "an ability to perform the basic an other types of activities under the conditions of the entrepreneurial risk and constantly changing business environment with the aim to maximize the welfare of the owners, strengthening the competitive advantages of an organization with consideration of the interests of the society and the government". However, the authors of the work [12] recommend the widely known methods that do not correspond to the given definition.

In work [13], the authors argue about the semantics of the word "stability" and offer the following definition: this is "the state of an enterprise whose economic activity ensures the fulfillment of all its obligations to employees, other organizations, its country, in normal conditions, thanks to sufficient incomes and matching income and expenses. This definition is virtually identical to the definition of solvency, since it is a question of "normal conditions", while "stability" implies opposition to unexpected or sudden negative effects.

Let's review the author's approach to solving the problems above.

III. RESEARCH METHODOLOGY

The most commonly used approach to assessing financial stability is based on comparing the magnitude of the sources of setting up the stock with the magnitude of the stock itself. These factors are used in both absolute and relative terms. In this case, stocks are understood as the entire group of assets reflected in the balance sheet account of the same name.

Three absolute indicators are used to characterize the availability of sources for stock setup: 1) own circulating assets (hereinafter - OCA); 2) own and long-term borrowed sources of stock setup. They are determined by the increase in the previous indicator in the amount of long-term loans and borrowings; 3) the total value of the main sources of stock setup. It is determined by the increase in the previous figure in the amount of short-term loans and borrowings.

A special indicator that tells how the stocks are provided with sources is used to help assessing the financial stability of an enterprise: 1) the excess or deficiency of the OCA: the sum of the stock is subtracted from the OCA; 2) the surplus or lack of own and long-term sources of stock setup: the amount of stocks is subtracted from their value; 3) the surplus or shortage of the total value of the main sources of stock setup: the sum of stocks is subtracted from their value.

Assessment of the financial stability in absolute terms is made depending on the combination of surplus and lack of various sources of stocks setup with the following gradation of stability: absolute, normal, unstable position, crisis situation.

The number and composition of relative indicators of financial stability is extremely diverse in the economic literature. We present only those indicators for which there is a quantitative assessment in literature, or its value is logically obvious. Indicators that do not have a numerical score are

excluded from consideration. Indicators that are inversely proportional to those considered are also excluded, since they do not carry new information with their "pair".

The most frequently used (taking into account the above restrictions) are: 1) the ratio of current assets to own working capital: the ratio of OCA to current assets as a whole; 2) the ratio of stocks with own working capital: the ratio of the OCA to the stocks as a whole; 3) financial independence ratio: the ratio of equity to the balance sheet total; 4) financial stability ratio: the ratio of the quantitative assessment of all liabilities to equity. There is a link that is not mediated by other factors between the coefficients of financial independence and financial stability. Therefore, for the analysis you need to use only one of these factors.

It is considered that an enterprise is absolutely financially stable if all coefficients satisfy the recommended values. The degree of financial stability can be assessed by the analyst according to the degree of compliance of the actual values of the coefficients with the limitations.

Methods for assessing financial stability in absolute and relative terms are fundamentally different. In the first case, the assessment is made only by comparison of stocks to possible sources of their setup, in the second case, OCA are compared with stocks and current assets as a whole; the ratio of own and borrowed funds is used additionally. This circumstance, as well as the multiplicity of variously defined indicators, makes it virtually impossible to formulate a definition of financial sustainability that satisfies both approaches.

Analyzing the existing approaches to the assessment of financial stability, it can be noted that all of them are implicitly based on the ability to continue business activities after a settlement of obligations by means of a lump sum settlement by an enterprise. This is evidenced by the comparison of the OCA with the value of stocks - the type of assets that quickly guarantee the successful business operations. Thus, the concept of financial stability should be close to the concept of solvency. This circumstance led a number of authors to the conclusion that these two concepts are identical. Nevertheless, we will justify a different point of view.

Let's review the problems of existing approaches to assessing financial stability in absolute and relative terms. At the same time, we will consider only "absolute" financial stability, considering its intermediate assessments as unprincipled.

We will proceed from the understanding of the OCA as part of current assets, which is formed from its own sources. We emphasize that the OCA is an asset, and one should speak not about the availability of the OCA stock as a source, but about the excess of the OCA values over the stocks. In this regard, the name "the ratio of current assets with own working capital" should be replaced by "share of OCA in current assets", "ratio of stocks with own working capital" - "coefficient of OCA excess over required current assets (let's call them like that for now without additional explanations)".

Currently, in economic analysis and financial management, this approach to calculating the OCA is used: the cost of non-current assets is deducted from the amount of equity capital with long-term liabilities. The basis for assigning long-term liabilities to the factor forming the OCA is that the term for calculating long-term liabilities is so significant that it allows us to consider this element of liability as constant. However, if you follow this logic, it would be possible to include the part of accounts payable that the company does not intend to settle in the next 12 months as sources of OCA. The existence of such intentions, unfortunately, is not only a fact of economic reality, but also finds scientific rationale in the form of works on "optimization of accounts payable". It does not draw attention to the fact that very often payables (except for part of the debt associated with mismatch of terms of accrual and reporting, as well as associated to the deferred payment specified in the contract) - this is a debt that the company was obliged to settle". Therefore, when preparing data for assessing financial stability, we will proceed from the fact that the source of OCA formation is equity.

The content of well-known methods for assessing financial stability implies that, in the presence of absolute financial stability, all current assets, except for stocks, are formed from borrowed funds and (or) they should be used to settle for liabilities. Let us list them: 1) receivables (long-term and short-term); 2) cash and cash equivalents; 3) other current assets. Proceeding from the general provision that a legal entity is liable for its obligations with all assets belonging to it, it should be assumed that the authors and users of the existing methodology believe that these types of assets should be settled with creditors if they make claims to pay off the company's debts, leaving inviolability stocks in general.

Of those listed, only cash and cash equivalents are precisely those types of assets that "by definition" are intended to pay off debt to creditors. To assume that, in the general case, the claims of creditors can be satisfied by receivables, it means to recognize the absence of a problem of non-payment. According to the author, accounts receivable in the general case (except for the one that is expected to be repaid in the near future, and therefore it can be conditionally considered cash) cannot serve as a means of satisfying creditors' claims.

Among those assets that are classified as "stocks", we can distinguish those that can clearly serve to satisfy the claims of creditors, in any case, more successfully than accounts receivable: finished goods and goods for resale. The remaining types of stocks are hardly of interest to creditors, because either they are unfinished goods or they are sent to the buyer, and after this business transaction all the same receivables may be formed.

Thus, the composition of current assets, which the company can send to settle its obligations to creditors without significant damage to the ability of successfully carrying out its economic activity (as they are intended either for this or for sale), will be as follows: 1) finished goods and goods for resale; 2) cash and cash equivalents.

If we proceed with absolute financial stability from the excess of the OCA over the amount of assets with which

the company does not cover its liabilities, so as not to disrupt the normal course of business, these types of assets should be distinguished: 1) raw materials, consumables and other similar values; 2) costs of the unfinished goods; 3) goods shipped; 4) receivables (long-term and short-term); 5) other current assets. That is, the listed assets of the enterprise must be left in its turnover in order to be able to continue operations after a one-time settlement of all liabilities. Earlier, we called them "required current assets" (hereinafter referred to as RC-assets).

Let's consider how the relative indicators of financial stability will change if the company simultaneously repays all its liabilities with circulating assets, leaving in its turnover the part which, according to the meaning of "OCA reserves," should not be sent to settle obligations (RC-assets).

The share of OCA in current assets will increase, as OCA themselves will remain unchanged, and the value of current assets, some of which were calculated on current liabilities, will decrease.

The OCA excess ratio over RC assets will remain unchanged, since the OCA themselves will remain unchanged, and the settlement of obligations will be effected by current assets that are not part of the RC assets.

The financial independence ratio will increase to unity, since all liabilities are settled, and the financial stability ratio, respectively, will decrease to zero.

Obviously, based on the criterion values of relative indicators, with full settlement of the obligations, financial stability will be absolute, if the ratio of the OCA excess over RC assets has previously satisfied the criterion value of financial sustainability. Note that in this case: 1) the company has demonstrated absolute solvency, since it was a question of full settlement of obligations; 2) the company has assets at its disposal, the use of which will ensure further profitable activity (if, of course, it was such); 3) the company has no debt, and, therefore, it is possible, if necessary, to resume borrowing.

If an enterprise has been able to settle only part of its obligations at a time, then relative indicators will have the same tendencies of change for the same reasons, but the results of these changes will be different: 1) the enterprise will demonstrate insolvency; 2) the company will have a balance of uncovered obligations that may impede profitable activities due to costs of their use; 3) since the enterprise has unfulfilled obligations, this can serve as an obstacle to additional borrowing, even with the willingness of third parties to provide it.

The given variants of changes in the coefficients mean that the solvency is methodically not related to financial stability, assessed by the above methods. This problem should also be solved methodically using other criteria. In order to have practical utility, they, must at least meet the following requirements: 1) methodical simplicity; 2) accounting data availability; 3) clarity of the criterion assessment logic. From a theoretical point of view, one more requirement must be met: the criteria for financial stability should be related to the criteria of solvency so that the insolvent enterprise could not be financially stable.

Before proceeding to accumulate an information base and analytical dependencies for assessing financial sustainability, it is necessary to formulate this concept, since it is primary from a methodological point of view: it is impossible to create an appropriate methodological apparatus without knowing what is meant by financial stability.

Let's formulate the concept of financial stability as follows: "Financial stability is the ability to continue the main economic activity under the condition of a lump sum settlement of all liabilities".

Under the lump sum settlement of liabilities and, accordingly, under the presentation of claims for them, is usually understood the period established by the law from the time a loan application is filed with the court to the preliminary hearing (this period may vary in different countries). If the settlement of all the obligations will occur before the judgment proceedings, which could technically happen at the day of the preliminary hearing, then the subject of the creditor's claims ceases to exist.

A situation that meets this definition of financial stability is not only formally possible, but also often occurs in practice of entrepreneurship.

Keeping in mind our definition of stability we can suppose that if an enterprise finds itself in the circumstances when it has to simultaneously settle all its obligations with all its creditors, and after doing so it can continue its usual business activity, than it is safe to say that such enterprise is absolutely financially stable.

Therefore, a significant feature that distinguishes financial stability from solvency is the ability of an enterprise to carry on its business activities after simultaneous settling with all its obligations. This question does not arise when determining the current solvency of an enterprise (such as it is understood in the educational sources). For this very reason the structure of the assets side of the balance sheet is regrouped only according to the speed at which assets are realized, apart from the purposes of own operations. This fact of matter determines the approach to the revision of the balance sheet structure when evaluating the solvency and financial stability.

In accordance with our definition, in assessing financial stability a balance sheet asset should be divided into two groups: 1) assets intended for a lump sum settlement of liabilities without losing the ability to continue economic activity (A_{1FS}); 2) assets, that could be used for the same settlements, but doing so will lead to loss of the ability to continue operations (RC-assets together with non-current assets necessary for continuation of activities and the possibility of realization of which does not allow covering current liabilities, A_{2FS}). Respectively, liabilities of the balance sheet should also be divided into two groups: 1) short-term and long-term liabilities (P_{1FS}); 2) permanent liabilities, which are not liabilities in the foreseeable future - otherwise the assumption of continuity taken in accounting (P_{2FS}) would be violated.

Proceeding from all the abovementioned facts we can say that the conditions for the financial stability of an enterprise are the following correlations:

1) A_{1FS} is greater than P_{1FS};

2) A_{2FS} is less than P_{2FS}.

Information for compiling the above inequalities can easily be extracted from the balance sheet, both compiled at the current moment and planned.

IV. PRACTICAL SIGNIFICANCE

The rapid test developed by the author in the article is easily applicable to the enterprises activities of any scale:

1) it does not require complicated calculations and is therefore available for analytics of any level of professional training;

2) information is provided with the data of the balance sheet and explanations to it and does not require additional information that is difficult to obtain or it requires special labor costs;

3) it is based on a logically clear approach to the formation of criterion assessments. Balance rapid test allows to estimate if the organization is ready to solve any sudden problems in obligations settlement associated with a significant excess of the value of the usual creditors requirements.

V. CONCLUSION

1) The definition of financial stability has been formulated, according to which a balance rapid test has been developed.

2) The developed method is based on the original one, with respect to similar methods, expressed in the condition of preserving the ability to continue economic activity in the case of a lump sum settlement of all obligations. This method:

- does not associate the value of the company's own working capital with the value of stocks, since not all stocks are assets that could be used for overcoming an extreme situation connected with obligations settlements without causing damage to the enterprise itself.

- does not use the value of correspondence between own and attracted sources of the assets of the enterprise, since all the extreme situations connected with obligations settlement can be solved with the help of the payment instruments and not only their sources.

3) Balance rapid test for assessing the financial stability of an enterprise requires a simple restructuring of the balance sheet to verify the criterion relationships, which determine the stability of the enterprise.

4) The methodological simplicity of the balance rapid test for assessing financial stability gives grounds for its wide use in analytical procedures.

VI. THE DISCUSSION OF THE RESULTS

The proposed approach to assessing the financial stability of an enterprise is clearly associated with an assessment of current solvency, since the conditions for forming the volume of means of payment and the obligations against them are much tougher than assessing current solvency by limiting the range of means of payment and expanding the range of obligations. Therefore, when using the balance rapid test of assessing financial stability, an enterprise which stability is established by this method will definitely have solvency. An enterprise with absolute current solvency will not necessarily be financially stable.

It should be noted that this method is not applicable to credit organizations, since the amount of their borrowed funds (liabilities) is obviously much more than their free cash and cash equivalents.

The preparation of information for the restructuring of the balance sheet should be given special attention. Current assets that ensure the financial stability of the enterprise (ROC-assets) should be attributed to the group of assets of the restructured balance sheet that are not intended to be used in settlements for liabilities. The necessary information should be contained in the explanatory note to the balance sheet.

References

[1] Astrinskiy D., Nanoyan V.(2000). Economic analysis of the financial position of the enterprise, *Economist.* 2000. No. 12, pp. 55-59.

[2] Balabanov I. T.. (2000). Financial analysis and planning of an economic entity. Moskow. Publ. *Financy i statistika*.

[3] Glazunov V. N. (1999). Analysis of financial condition of the enterprise, in *Financy*. No. 2, pp. 15-17.

[4] Grafov A. V. (2001). Assessment of financial and economic condition of the enterprise, *Financy*. No. 7, pp. 64-67.

[5] Dikareva V., Kankhva V. (2017). Evolution Procedure for Financial Stability of the Enterprises of Housing and Utilities Infrastructure. *International Science Conference SPbWOSCE - SMART CITY*. MATEC Web of Conferences. Vol. 106, art: 08022,.

[6] Bidzhoyan D. S., Bogdanova. T. K. (2016). Modelling the financial stability of an enterprise taking into account macroeconomic indicators, *in Business Informatics*. No. 3 (37), p. 30.

[7] Altman E. I. (1968). Financial ratios. Discriminant analysis and the prediction of corporate bankruptcy", in *The Journal of Finance*. No. 20, pp. 589-609.

[8] Azarenkova G. M, Golovko O. G., Ponomarenko V. A. (2015). Improving financial strategy to ensure the stability of the enterprise", in *Financial and credit activity-problems of theory and practice*. 2015. Vol. 1, issue 18, pp. 103-109.

[9] Gratchev A. V. (2010). Financial stability of the enterprise: criteria and methods of evaluation in the market economy. Moskow. Publ. *Delo i servis.*

[10] A. F. Chernenko, N. N. Ilisheva, A. V. Basharina. 10. Financial position and efficiency of use of resources of the enterprise. Moskow. Publ. *YUNITI-DANA*. 2009.

[11] Khabibullina E. R. (2004). Financial stability of the enterprise", in *Vestnik Astpakhanskogo gosudarstvennogo tekhnicheskogo universiteta*. No. 3 (22), p. 229-234.

[12] Gilyarovskaya L. T., Endovitskaya A. V. (2006). Analysis and evaluation of financial stability of commercial organizations. Moskow. Publ. *YUNITI-DANA*.

[13] Kuznetsova I. D., Kukushkina O. A. (2009). On the issue of financial sustainability of enterprises". Appendix to the journal *Sovremenniye naukoemkiye tekhnologiyi*. No.4, pp. 42-49.