THE ASSESSMENT OF METHODS FOR DETERMINATION OF COMPANY’S SOLVENCY

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There are many methods for assessment of the solvency of companies. One method of the financial analysis is calculation of the financial coefficient and determination of the relationship between the indicators, which is used in the assessment of the solvency of enterprises and in the forecasting of insolvency and bankruptcy. To examine the suitability of offered methodologies for determining solvency to conditions in Latvia, the author conducted a theoretical research and a practical study on methods for determining the solvency, by using data from financial statements from small enterprises in Latvia. The aim of the research is to assess the methods for determining the solvency of enterprises. The result of the research shows that different methods of assessing the solvency of the company give different results, that the data from financial statements do not give complete and objective assessment of the company solvency, and it is not possible to forecast the financial stability of the company by using only financial indicators.

Keywords: assessment, financial indicators, solvency.

JEL Codes: R11, Z19.

1. Introduction

Analysis of the financial situation of a company provides an opportunity to determine the strengths and weaknesses of the company’s economic activity. Many authors have forecasted the financial health of company, by using financial information. Traditionally the analysis of financial ratios has been used to forecast the solvency of company.

In the author’s opinion the terms of solvency and insolvency have been precisely formulated by L. C. Heath and P. Rosenfield (1979 p. 48) that: “Solvency is a money or cash phenomenon. A solvent company is one with adequate cash to pay its debts; an insolvent company is one with inadequate cash. Evaluating solvency is basically a problem of evaluating the risk that a company will not be able to raise enough cash before its debts must be paid. Solvency analysis is not simply a matter of evaluating a company’s so-called current assets and liabilities”.

Studies of economic and scientific literature give evidence that scientists regard the concept of “bankruptcy” as equal to the concept of “insolvency”, moreover, also the bankruptcy forecasting models elaborated by various scientists, in point of fact, are forecasting the likelihood of insolvency of a company (Šneidere, 2009).
W. Beaver (1966) is one of the first researchers to study the bankruptcy prediction. He has examined the predictability of 14 financial ratios using 158 samples that consisted of bankrupted and non-bankrupted companies. J. W. Wilcox (1971) presented a simple theoretical model, intuitive theory of business risk, offering an explanation for Beaver's empirical results. Many authors have researched the problems of assessing the solvency of an enterprise, by using financial ratios that are different both in terms of their nature and in terms of their total number. Twenty-four financial ratios have been used to assess the financial situation of companies (Bose, 2006), forecasting the occurrence of financial difficulties 1, 2 and 3 years before these difficulties have taken place – 29 financial ratios (Lieu, 2008), studying the financial indicators of bankrupted and non-bankrupted companies – 27 financial ratios (Min, 2009), assessing the financial health of the companies – 26 financial ratios (Kramin, 2003), 17 financial ratios (Halim, 2011), 16 financial ratios (Bhunia, 2011) and 12 financial ratios (Xidomas, 2009).

The diversity of methods for determining the solvency that is shown in economical and scientific literature creates a necessity to carry out a theoretical research and a practical study to verify suitability of the offered methods to conditions in Latvia. This research is created as a sub-research to substantiate the need for the non-financial indicators for a system to assess the activity of companies and to include the aggregate of certain financial and non-financial indicators.

The aim of the research is to evaluate the methods for determining the solvency of companies.

In order to accomplish the purpose of the research the following tasks have been put forward:
- to conduct theoretical research on the methods for determining solvency;
- to assess the suitability of the offered methods for determining solvency to conditions in Latvia;
- to make conclusions.

The object of the research is the methods for determining solvency.

General scientific research methods are used in the research: information analysis and synthesis, logically constructive, data grouping and graphical display methods.

2. The methodology of the research

There are many methods for the assessment of solvency of enterprises. One method of the financial analysis is calculation of the financial coefficient and determination of the relationship between the indicators, which is used in the assessment of the solvency of enterprises and in the forecasting of insolvency and bankruptcy. C. Gibson (1982) regards that it is possible that there are not any as effective tools for determining the financial future of the company as a suitable use of financial ratios. Financial indicators are often expressed as financial ratios (Suarez, 2011). Which financial indicators should be used, which of them are the most important, how to assess them, etc.? Different authors have divergent views, and they offer to use different financial indicators or groups of financial indicators.
The author within the framework of particular research will carry out theoretical studies in several methods for the detection of solvency and the examination of practical suitability of these methods for conditions in Latvia.

V. Koval (2006) sees the financial situation of company from short- and long-term point of view, because there are two main tasks for a company: to be able to settle its short-term liabilities and to be able to provide options for long-term financing as well as to be able to maintain the established or desired structure of the company capital.

Stocks as the least liquid part of current assets and the amount of net working capital are used when assessing both the part of net working capital, which has absolute liquidity and the part of the working capital / reserves, which is financed from the net working capital of the company. It is possible to use stocks, the amount of net working capital and the source of stock financing (SSF = NWC + short-term debts + payables to suppliers and contractors + advances received from customers) to relatively assess the short-term financial stability of the company (Kovalev, 2006).

M. Abrjutina (2000) distinguishes three priority indicators, when assessing the financial-economic situation of a company:

\[ R = \text{Equity} - (\text{Stocks} + \text{Fixed assets} + \text{Intangible assets}) \]  
\[ R' = (\text{Cash} + \text{Short-term investments}) - \text{Total debt} \]  
\[ R'' = \text{Equity} - (\text{Fixed assets} + \text{Intangible assets}) \]

When conducting an express-analysis of the financial-economic situation of the company, first, the difference between equity and non-financial assets must be determined (R) – it is considered as the indicator of financial-economic stability. If R > 0, the company is placed in a stability region and R’ indicator must be determined for a more detailed assessment of the financial situation. It provides for two options: if R’ ≥ 0, it shows absolute stability; if R’ < 0, it shows normal stability. If R < 0, the company is placed in an unstable region and R” indicator must be determined for a more detailed assessment of the financial situation. It provides for two options: if R” ≥ 0, the company is in the tension area; if R” < 0, the company is in the risk area.

J. Mackevičius (2010), when assessing the possibility of bankruptcy for a company, deals with ten the most important financial indicators and especially highlights the role of current ratio and quick ratio indicators, debt to asset ratio, return on equity and return on sales indicators when forecasting the bankruptcy of a company. J. Mackevičius highlights the regulations of the given indicators which, according to him, shows the deterioration of the company’s financial situation and the possible bankruptcy of the company: current ratio indicator less than 1.0; quick ratio indicator less than 0.5; debt to asset ratio more than 1.0; negative return on equity and return on sales indicators.

The financial indicators are selected for the comparison between the financial indicators of the companies and the average financial indicators in the sector, according to 9 financial indicators in the sector calculated and publicized by the Central Statistical Bureau of the Republic of Latvia: current and cash ratios; debt to asset ratio; debt to equity ratio; short-term debt ratio; total assets turnover, return on assets, equity and sales.
For forecasting insolvency and bankruptcy T. Bogdanova (2012) and many authors (Altman, 1968; Smith, 2005; Rafiei, 2011; Baixauli, 2010; Korchagina, 2006) have used financial ratios in different combinations and developed or used forecasting indexes for determining the degree of bankruptcy probability. The author has used two models for the bankruptcy forecasting: E. Altman’s bankruptcy forecasting model: \( Z = 0,717 X_1 + 0,847 X_2 + 3,107 X_3 + 0.42 X_4 + 0,995 X_5 \) (Šneidere, 2009) and bankruptcy forecasting model by V. Šorins, I. Voronova, which is adapted to conditions in Latvia: \( Z = -2,4 + 2,5 X_1 + 3,5 X_2 + 4,4 X_3 + 0,45 X_4 + 0,7 X_5 \) (Šorins, 1998).

With an aim to assess the practical use of theoretically described methods in determining the solvency of companies, the author of the research has performed the approbation thereof, on the basis of financial statement data for 2009–2011 from the companies that were liquidated / reorganized in 2012. Subject matter of the research: the level of solvency in the period of liquidation.

The assessment of solvency of the Latvian enterprises has been made by means of 5 methods for the assessment of solvency of the companies (see Table 1).

<table>
<thead>
<tr>
<th>Method</th>
<th>The methods for determining the solvency of companies</th>
</tr>
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<tbody>
<tr>
<td>Method 1</td>
<td>The assessment of short-term stability and liquidity type, using V. Kovalev (2006) method, since there net turnover capital is used as one of the evaluating indicators, which in Latvia is used on a wider scale than calculation of the stock financing sources (Savickaja, 2002; Ljubushin, 2000)</td>
</tr>
<tr>
<td>Method 3</td>
<td>The assessment of conformity of the financial indicators of the companies to the elements of bankruptcy, by using J. Mackevičius (2010) criteria</td>
</tr>
<tr>
<td>Method 4</td>
<td>The comparison of financial indicators of the company and the average indicators in the sector</td>
</tr>
<tr>
<td>Method 5</td>
<td>The forecasting of bankruptcy of companies, by using the bankruptcy forecasting model adapted by E. Altman (1), V. Šorins and I. Voronova (2)</td>
</tr>
</tbody>
</table>

Additional criteria for evaluation were established by the author for methods 3 and 4. Five financial indicators are used in method 3 and, the more these indicators are conforming, the more this enterprise coincides with the elements of bankruptcy. The number of corresponding financial indicators and assessment thereof: \#2 financial indicators – no risk of bankruptcy; 3 to 4 financial indicators – there is a possibility of bankruptcy; and 5 financial indicators – high probability of bankruptcy. Nine financial indicators are used in method 4, and, the larger amounts of indicators are below the average level of the sector, the worse is the rating of the company. The number of corresponding financial indicators and assessment thereof: \#4 financial indicators – normal financial situation; 5 to 7 financial indicators – unstable financial situation; and 8 to 9 financial indicators – critical financial situation.

In Latvia the total economically active market section in group of statistical unit size – small enterprises, in form of business – commercial enterprises according to the type of activity in 2011, as in the previous years, was made from 3 sectors:
wholesale and retail trade, repair of motor vehicles and motorcycles 26.82%, manufacturing 14.19% and construction 11.65% (Uzņēmumu skaits).

Information from SIA “Lursoft” database has been used for selection of small enterprises, determining the published financial statements and viability of enterprises.

The selection of sample of analyzed enterprises was made based on these criteria:

- have filed annual reports with SIA “Lursoft” for 2005–2011;
- comply with the criteria of small enterprises: the number of employees is from 10 to 49, annual turnover ≤7.028 million lats or balance sheet total ≤7.028 million lats (What is an SME?);
- enterprises from certain economic sectors (NACE): (C) Manufacturing; (F) Construction; and (G) Wholesale and retail trade; repair of motor vehicles and motorcycles.

Based on the criteria for selection, the set of research enterprises is made of 7 companies, including 5 that were liquidated and 2 that were reorganized (incorporated in other companies) in 2012. The set of liquidated enterprises is made from the manufacturing companies, and the set of reorganized enterprises – from wholesale and retail trade; repair of motor vehicles and motorcycles companies.

The set of research enterprises are characterized by different reasons for liquidation: one or more insolvency proceedings (companies 1–3), legal protection proceedings (companies 1 and 3), two enterprises have started the liquidation process themselves (4 and 5) and two enterprises (6 and 7) have been reorganized.

The liquidation / reorganization process of the enterprise affects financial statements of the enterprise. If the company management seeks to liquidate the company or knows conditions that create doubts about the company’s ability to continue its activity in the next reporting year, it should be displayed also in the balance of the company. For example, if fixed assets are no longer meant to be used in long term but for sale, they are reclassified as goods. Savings, reserves, revenue and expenses for the next period are not developed in the balance. Based on these elements, according to the balance sheet data for 2001, it could be possible to forecast that their activities in 2012 will not continue enterprises 1, 2, 3 and 4. In the 2011 balances of enterprise 5, 6 and 7 these elements are not present. Therefore the assessment of the activities of companies has been made not only in 2011 but also in 2009 and 2010 – two and three years before the liquidation / reorganization.

3. Results of the research

Method 1 for assessing the short-term financial stability and liquidity of company in 2009–2011 is presenting ambiguous results (Table 2). The short-term financial stability and liquidity of the companies changes over the years both in positive (enterprises 1 and 4) and in negative direction (enterprise 3). Although enterprises are liquidated (enterprises 2 and 5) and reorganized (enterprises 6 and 7) in 2012, in the research period the short-term financial stability and liquidity is evaluated as normal or absolute. In accordance to the obtained results it is possible to conclude that in 2011, a year before liquidation / reorganization, all the companies, except enterprise 3, the short-term financial stability or liquidity has to be evaluated as normal or abso-
lute. Therefore analysis of short-term financial stability and liquidity of the given enterprise is not completely objective.

When evaluating the financial-economic situation of the enterprises as a complex, using method 2, it is possible to conclude that in 2009–2001 enterprises 1, 2, 3 and 7 do not have enough equity to cover stocks, fixed assets and intangible assets of the enterprises. According to methodology, the companies enter the unstable region, and the lack of equity to finance fixed assets and intangible assets in the enterprises has to be evaluated as a risk area. Enterprise 5 does not have sufficient equity to cover stocks, fixed assets and intangible assets of the companies, however, through equity the enterprise funds fixed assets and intangible assets. The financial-economic situation of enterprise 5 in 2009–2011 is better when comparing to enterprises 1, 2, 3 and 4. Enterprise 5 is placed in an unstable region, area of tensions. Enterprises 4 and 6 have variable financial-economic situations in 2009–2011, however in 2010 (two years before the liquidation / reorganization) the enterprises are in a stability area and an absolute stability. This shows that the equity of the enterprise is sufficient to cover the stocks, fixed assets and intangible assets of the enterprise, and also sufficient to finance the borrowed capital through cash and short-term investments of the enterprise. In 2011 (a year before the liquidation / reorganization) the enterprises are in a stability area and an absolute stability. It shows that the enterprises have sufficient equity to successfully cover stocks, fixed assets and intangible assets of the enterprises but is not sufficient enough to finance the borrowed capital through cash and short-term investments of the enterprise.

When assessing financial indicators of the enterprises in 2010–2011 by the method 3, it can be concluded that from 5 indicators than point at the possible bankruptcy of enterprises, the numbers of indicators are varying from 1 to 5. From 7 enterprises the largest possibility of bankruptcy at the end of 2011 was sequentially to enterprises 1, 3, 2 and 5.

When assessing financial indicators of the enterprises in 2010–2011 according to the sectors and comparing to average indicators in the sector (method 4), it can be concluded that the indicators for separate company in the manufacturing sector are both better and worse than the average indicators in the sector as well as the desired value of specific financial indicator. When comparing financial indicators from different companies, it can be concluded that:

- for the enterprise 1 all the considered financial indicators in 2010 and 2011 have been worse than average indicators in the sector (lower liquidity, higher financial dependency, lower total assets turnover, etc.);
- for the enterprise 2 in 2010 worse than the average indicators in the sector have been: lower cash ratio, higher debt to asset ratio and debt to equity ratio, lower return on sales. In 2011, all financial indicators, except cash ratio and total assets turnover, have been worse than average ratios in the sector;
- in the enterprise 3 in 2011 all the financial indicators, but in 2010 all the financial indicators except total assets turnover, have been worse than average ratios in the sector;
• in the enterprise 4 in 2010 all the financial indicators have been better than average ratios in the sector, but in 2011 all the financial indicators, except total assets turnover, have been worse than average ratios in the sector;

• in the enterprise 5 in 2010 all financial indicators are better that average ratios in the sector, except cash ratio, but in 2011 all financial indicators, except total assets turnover, have been worse than average ratios in the sector.

It is possible to conclude that from 5 enterprises at the end of 2011 sequentially to enterprises 1, 3, 4, 5 and 2 financial indicators have been lower than average ratios in the sector.

To the wholesale and retail; repair of motor vehicles and motorcycles enterprises, as with manufacturing companies, the indicators for separate companies are both better and worse than average indicators in the sector as well as the desired value of certain financial indicator. When comparing financial indicators of enterprises 6 and 7, it is possible to conclude that:

• in the enterprise 6 in 2010 and 2011 worse than average ratios in the sector: lower total assets turnover and lower return (asset, equity and sales);

• in the enterprise 7 in 2010 all the financial indicators, except total assets turnover and return on assets have been worse than average ratios in the sector. In 2011 all the financial indicators, except return on equity, have been worse than average ratios in the sector.

It is possible to conclude than from 2 enterprises at the end of 2011 to enterprise 7 financial indicators have been lower than average ratios in the sector.

The solvency of companies has been assessed, using two business insolvency models (method 5). The results of models, although there are 3 possible forecasts for bankruptcy in the model 1 (Z < 1.23 – high probability of bankruptcy, 1.23 < Z < 2.9 – there is a possibility of bankruptcy, and Z > 2.9 – low probability of bankruptcy) and 2 possible forecasts for bankruptcy in the model 2 (Z < 0 – high probability of bankruptcy and Z > 0 – no risk of bankruptcy), give an unambiguous answer in the case of enterprise 1 – high probability of bankruptcy in 2009–2011 – and in the case of enterprise 6 – no risk of bankruptcy / low probability of bankruptcy in 2009–2011. Considering other enterprises, the models give different results, in some cases even completely opposite situation assessments. For example, the enterprise 4, according to E. Altman bankruptcy forecast model, at the end of 2011 has a low probability of bankruptcy, but, according to V. Šorins and I. Voronova bankruptcy forecast model – a high probability of bankruptcy. Summarizing the Z values of the bankruptcy forecasting models and the probabilities of bankruptcy in 2009–2011, it is possible to conclude that the given models in some cases characterize the situation contradictory and are not reliable to forecast the future activities of the enterprises.

The summary of methods for determining the insolvency of enterprises (Table 2) and comparative assessment shows mixed results.

The gained results can be valued from two sides:

• the same / similar / different assessment of solvency that is gained by using methods 1–5;

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Comparative assessment of the methods that are used for determining insolven-
cy shows that different methods for determining insolvency in 2009–2011 in different cases show different situations of enterprise solvency.

Table 2. The results of determining the solvency of enterprises in 2009–2011

<table>
<thead>
<tr>
<th>Method</th>
<th>Year</th>
<th>Enterprises</th>
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<tbody>
<tr>
<td></td>
<td>2009</td>
<td>ASTFS</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>ASTFS</td>
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<tr>
<td></td>
<td>2011</td>
<td>CSTFS</td>
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<td></td>
<td>2009</td>
<td>UR, RA</td>
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<td></td>
<td>2010</td>
<td>SA, AS</td>
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<td></td>
<td>2011</td>
<td>SA, NS</td>
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<tr>
<td></td>
<td>2009</td>
<td>HPB</td>
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<tr>
<td></td>
<td>2010</td>
<td>PB</td>
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<tr>
<td></td>
<td>2011</td>
<td>HPB</td>
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<tr>
<td></td>
<td>2009</td>
<td>NF</td>
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<tr>
<td></td>
<td>2010</td>
<td>NF</td>
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<tr>
<td></td>
<td>2011</td>
<td>CFS</td>
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<tr>
<td></td>
<td>2009</td>
<td>HPB</td>
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<tr>
<td></td>
<td>2010</td>
<td>LB</td>
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<tr>
<td></td>
<td>2011</td>
<td>HPB</td>
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<tr>
<td></td>
<td>2009</td>
<td>NRB</td>
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<tr>
<td></td>
<td>2010</td>
<td>PB</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>HPB</td>
</tr>
</tbody>
</table>

Abbreviation:
Method 1: Absolute short-term financial stability (ASTFS); Normal short-term financial situation (NSTFS); Unstable short-term financial situation (USTFS); Critical short-term financial situation (CSTFS). Method 2: Stable area, absolute stability (SA, AS); Stable area, normal stability (SA, NS); Unstable region, tension area (UR, TA); Unstable region, risk area (UR, RA). Method 3: No risk of bankruptcy (NRB); Probability of bankruptcy (PB); High probability of bankruptcy (HPB). Method 4: Normal financial situation (NFS); Unstable financial situation (UFS); Critical financial situation (CFS). Method 5 (1), (2): Low probability of bankruptcy (LPB); Probability of bankruptcy (PB); High probability of bankruptcy (HPB); No risk of bankruptcy (NRB).

By analyzing the assessments of solvency in 2009–2001 that are gained by methods 1–5, it is possible to conclude that similar assessments have been for enter-
prises 1, 2, 3 and 6, but for enterprises 4, 5 and 7 the ratings in certain cases have been different, even contradictory. For example, the enterprise 4 in 2011 by method 2 has a normal stability, by method 4 – a critical financial situation, and by method 5 (2) – high probability of bankruptcy.

Comparative assessment of methods for determining enterprise solvency shows that the assessment of enterprise solvency in 2009–2011 describes the actual situation in 2012 (liquidation / reorganization) semi-accurately.

According to the assessments of solvency situation in 2011 „Normal stability“ (method 2), „Normal financial situation“ (method 4), „No risk of bankruptcy“ (method 3, method 5 (2)), „Low probability of bankruptcy“ (method 5 (1)) the possibility of liquidation / reorganization should not have been connected with these enterprises, based on the method of determining solvency: enterprise 4 and 6 (method 2); enterprise 4, 6 and 7 (method 3); enterprise 6 (method 4); enterprise 5 and 6 (method 5 (1)); enterprise 6 (method 5 (2)).

Comparative assessment of methods for assessing solvency, based on the insolvency assessment of 7 enterprises in 2009–2011 and comparison of these assessments with the actual situation in 2012 (liquidation / reorganization) is indicative of the inability to accurately forecast financial stability of the enterprises, using only the financial indicators of the enterprises. If the financial indicators were supplied with non-financial indicators, it would raise the objectivity of the assessment.

In total this research substantiates the inability of financial indicators to precisely assess the solvency of the company and creates a necessity to develop a system of indicators for evaluating the business activity of a company – the system would consist of certain set of financial and non-financial indicators. Author’s future research will be linked with the development of a complex system of indicators for evaluating the business activity of a company.

4. Conclusions

1. Comparative assessment of methods for determining the enterprises’ solvency shows that different methods for determining insolvency in 2009–2011 in particular cases present different solvency situations.

2. Comparative assessment of methods for determining the enterprises’ solvency shows that the assessment of solvency in 2009–2011 is partly inaccurate when describing the actual situation in 2012 (liquidation / reorganization).

3. In 2012, according to solvency assessments of the enterprises „Normal stability“, „Normal financial situation“, „No risk of bankruptcy“, „Low probability of bankruptcy“ in 2011 there have been no elements of liquidation / reorganization in the results of these solvency assessments (for the enterprises that have been liquidated / reorganized later): enterprise 4 (2 of 5 assessments), enterprise 5 (1 of 5 assessments), enterprise 6 (5 of 5 assessments) and enterprise 7 (1 of 5 assessments).

4. Comparative assessment of methods for determining the enterprises’ solvency and their comparison to the actual situation in 2012 (liquidation / reorganization) shows a lack of possibility to precisely forecast the financial stability of companies, using only financial indicators of the companies.
5. To increase the accuracy of the assessment of company’s financial situation, it is necessary to supplement the financial indicators with the non-financial indicators.

References


ĮMONIŲ MOKUMO NUSTATYMO METODŲ ĮVERTINIMAS

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