

## AGGREGATE ASSESSMENT OF A COMPANY'S FINANCIAL VIABILITY

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**Abstract.** Identifying the adequate level of financial viability refers to the most vital economic issues, since inadequate financial viability can result in the lack of resources for development, insolvency and bankruptcy of the company, but the excess viability can impede development burdening the company with excessive reserves. The authors suggest an aggregate approach for assessment of the level of company's financial viability based on the concept of marginal values of financial viability indicators developed by the authors. Level of adequacy, excess or lack of a general financial viability will be assessed by rationing of upper and lower margins of financial viability indicators. Suggested approach can be considered as an effective tool for controlling company's solvency level, estimating the risk of bankruptcy and choosing best possible alternatives for running economic activities in line with sustainable development.

**Keywords:** aggregate assessment of financial viability, upper and lower margin of level of financial viability indicator, adequacy, excess and lack of level of general financial viability.

**Jel classification:** G39, M19

### 1. Introduction

The potential for sustainable development of modern commercial enterprises in a competitive environment depends on company's ability to maintain and boost the level of its financial viability. Provision of financial viability and stable development is necessary not only for the organizations themselves but also for their partners who require the information about their customer's prosperity and reliability.

Each year the problem of insolvency, bankruptcy and low financial viability of Latvian and other Baltic companies is getting more and more serious. In 2010 the number of registered insolvent enterprises in Latvia has been the highest among the Baltic States. Comparing with 2009 year, it has risen by 69.1 %. Every 174 out of 10000 companies are ceasing to function (Creditreform 2010). It's worth mentioning that in 2008 Latvia was also a leader among the Baltic States in terms of number of insolvent companies. The number of registered insolvent companies here equalled to 99 out of every 10000 (Creditreform 2008).

Objective evaluation and control of financial viability are becoming indispensable condition for maintaining sufficient level of financial viability for sustainable development, solvency and low probability of bankruptcy.

The aim of the research is to develop the aggregate assessment of company's financial viability

by means of rationing of values of financial viability indicators in order to monitor the level of financial viability and estimate the risk of bankruptcy.

### 2. The concept of financial viability and indicators for its assessment

Within the scope of the research the authors carried out different types of analysis: 1) content analysis of scientific literature, 2) morphological and 3) definition and lexicographic analysis of the concept of financial viability of a company.

The literature analysis showed that there is still no consistent conceptual definition of financial viability phenomenon. All approaches for defining of financial viability were divided conditionally into three groups of authors who: 1) associate the given concept with a company's solvency and understand financial viability as a result of the company's activity achieved by means of the efficient use and distribution of financial resources (Pink *et. al.* 2007.; Registrar of Community Housing 2009; Lancaster 2004; RiverGuide 2006; Mahova, Grazhdankin 2009; and others); 2) consider that financial viability is closely connected to the concept of sustainable development and is one of the factors which provides it (Thomson 2005; MDFL 2011; Dronov *et. al.* 2006; Lusthaus 2002; Adrien, Lusthaus 1999; Loan Finance dictionary 2009; and others); 3) define financial

viability through the concepts of equilibrium and risk (Mouriaux, Foulcher-Darwish 2006; Kul'baka 2009 and others).

The authors of this research has concluded, that the financial viability is such distribution and use of financial resources which allows to sustain the state of a company's equilibrium in a short-term period and provide sustainable development of a company in a long-term period (Koleda, Lace 2009, 2011 ).

Assessment of the level of a company's financial viability in most of the sources is limited to the analysis of some quantitative and qualitative financial indicators. The analysis of financial and economic literature allowed determining the frequency of application of such indicators. The following indicators turned out to be the most frequently used: debt to equity ratio; working capital financed by owner's equity; solvency ratio; equity to assets ratio (Robinson 2011; Helfert 2001; Crimson Consultancy 2009; Damodaran 2003; Beaver 1966; Altman 1968; TSA 2009; Bocharov 2001; Euresearch 2009; and others).

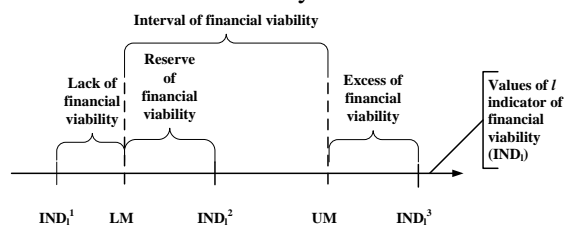
In the course of scrutinizing the scientific literature, the authors have concluded that there is no publicly available information about any kind of a uniform approach to the analysis of financial viability of the companies which belong to the non-financial sector. Nevertheless, there is a special methodology elaborated by the specialists from the International Monetary Fund (IMF) for the analysis of financial viability of the financial sector which also includes the analysis of the non-financial sector companies. The total of indicators included in the IMF methodology for analyzing financial viability of the non-finance sector companies involves the following characteristics (IMF 2007): debt to equity ratio; profitability (return on equity, return on assets and return on sales); debt service coverage; currency positions; number of applications for protection from creditors. Debt to equity ratio shows the vulnerability of a company in cases of distress, as well as the ability of the enterprise to pay off the debts. Return on equity, return on assets and return on sales is the most significant factor which determines financial viability, as well as sustainability in general. The debt service coverage ratio reflects the ability to process the loan. The number of applications for protection from creditors is an indicator of the aggregate number of non-financial corporations' residents, which during the period under review, applied for protection from creditors. This indicator has not been observed within the framework of the present research, as it does not refer to certain company. The currency positions ratio reflects the exposure to currency risk. This indicator has not

been examined within the framework of the present research as it reflects the influence of external factors which are not possible to control with the resources of internal potential of some companies.

The indicators included in the IMF methodology fully reflect the existing ideas about the assessment of the company's financial viability in the scientific literature, and confirm the results of the morphologic and definition and lexicographic analysis which has been carried out by the authors. Representativeness of the results obtained by means of the given indicators has also been verified. The authors have carried out a comparative assessment of the dynamics of change in registered companies ratio in the service sphere in the Riga region on the one hand, and the dynamics of change in the true value of the indicators of financial viability on the other, and have come to the conclusion that the results of the analysis on the basis of the indicators included in the IMF methodology are representative (Koleda, Lace 2009), nevertheless the authors see some limitations in their application on the micro-level: 1) the indicators can be analyzed only in dynamics; 2) methodology doesn't provide the general evaluation of financial viability; 3) methodology does not presuppose the factor analysis and sensitive analysis of certain indicators, the methodology does not presuppose the mechanism for managing financial viability.

### 3. Distribution of financial viability zones

Identifying the adequate level of financial viability refers to the most vital economic issues, since inadequate financial viability can result in the lack of resources for development, insolvency and bankruptcy of the company, but the excess viability can impede development burdening the company with excessive stock and reserves. In order to identify the adequate level of financial viability the authors suggest the following distribution of the zones of financial viability:



**Fig.1.** The zones of financial viability (created by authors; source: Lace, Koleda 2011)

Explanation, figure 1:°

$IND_1^1$ ;  $IND_1^2$ ;  $IND_1^3$  – possible values of  $l$  indicator of financial viability;

LM – lower margin of financial viability zone;

UM – upper margin of financial viability zone;  
 $\{-\infty; ML\}$  - zone of financial instability;  
 $[LM; UM]$  - interval of financial viability zone;  
 $\{UM; +\infty\}$  - zone of financial viability excess;  
 $IND_1^1 \in \{-\infty; ML\}$  - the value of  $l$  indicator situates in the zone of financial instability;  
 $IND_1^2 \in [LM; UM]$  - the value of  $l$  indicator situates in the zone of financial viability;  
 $IND_1^3 \in \{UM; +\infty\}$  - the value of  $l$  indicator situates in the zone of financial viability excess.

In order to calculate the level of adequate financial viability, interval of financial viability, reserve, excess or lack of indicators of financial viability, introduction of additional concepts is suggested: 1) «lower margin» – such value of indicator under which the level of financial viability is the lowest, but permissible for business activity without a risk of bankruptcy; 2) «upper margin» of indicator - such value of indicator under which the level of financial viability is the highest however the further increase of the value of financial viability indicator is capable to upset the equilibrium condition of the enterprise.

It is necessary to point out that depending on how growth or fall in the numerical value of the indicator influences the level of the company's financial viability, the approaches to calculations of the indicators mentioned above will differ.

Applying mathematical method of substitution and correlation analysis, as well as taking into consideration balance sheet equations and the particular legal acts on bankruptcy of enterprises, upper and lower margin values for indicators of financial viability can be determined.

Upper marginal values can be calculated by means of correlation analysis. Two relationships should be measured: 1) between an indicator of financial viability and current liquidity and 2) between an indicator of financial viability and debt to asset ratio. Regressive and substitution analysis are applied on the next step. Logic of determining of upper margin values for indicators of financial viability is shown in the table 1. Minimum positive upper marginal value from upper marginal values which correspond to relationship with *liquidity* and *debt to equity ratio* should be chosen.

**Table 1.** Logic of determining of upper margin values for indicators of financial viability

Dependence between the value of $l$ indicator and the level of financial viability					
Direct: the increase of value of $l$ indicator can cause the solvency			Inverse : the decrease of value of $l$ indicator can cause the solvency		
Indicators	$l$ indicator of financial viability	Upper marginal value	Indicators	$l$ indicator of financial viability	Upper marginal value
Liquidity	Correlation is close positive	No upper marginal value	Liquidity	Correlation is close positive	Regressive analysis when current liquidity $\geq 1$
	Correlation is close negative	Regressive analysis when current liquidity $\geq 1$		Correlation is close negative	No upper marginal value
	No correlation	No upper marginal value		No correlation	No upper marginal value
Debt to assets ratio	Correlation is close positive	Regressive analysis when debt to assets ratio $< 0.5$	Debt to assets ratio	Correlation is close positive	Upper marginal value of debt to equity ratio ( $UM_{d-t-e}$ )*
	Correlation is close negative	No upper marginal value		Correlation is close negative	Regressive analysis when debt-to assets ratio $< 0.5$
	No correlation	No upper marginal value		No correlation	No upper marginal value

\* $UM_{d-t-e} = \text{Lack of ROE} / ((1-\text{The Rate of Profit Tax}) \times (\text{ROA}-\text{average interest charge}))$  (1)

Different approaches can be used for determining lower marginal value of an indicator of financial viability. For example, lower marginal value for *debt to equity ratio* can be determined using: 1) capital sufficiency approach ( $LM_{d-t-e}^a$ );

2) taking into account financial leverage effect ( $LM_{d-t-e}^b$ ), and 3) taking into account the specific of legislation ( $LM_{d-t-e}^c$ ).

Minimum positive lower marginal value from three available upper marginal values is chosen according to the equation (2).

$LM_{d-t-e} = \min[LM_{d-t-e}^a; LM_{d-t-e}^b; LM_{d-t-e}^c] \geq 0$ , (2)

where:

$LM_{d-t-e}^a$  – lower marginal value of *debt to equity ratio* according to capital sufficiency approach, see equation (3).

$$LM_{d-t-e}^a = \text{Permissible value of liabilities} / \text{Sufficient value of own capital} \quad (3)$$

The *sufficient value of own capital* and *permissible value of liabilities* are identified according to the equation (4, 5) given below (Lace, Sundukova 2008):

$$\text{Sufficient value of own capital} = \text{Long-term assets} + \text{Inventories} - \text{Provisions} - \text{Long-term liabilities} \quad (4)$$

$$\text{Permissible value of liabilities} = \text{Total assets (actual)} - \text{low liquid assets that should be financed at the expense of own capital} \quad (5)$$

$LM_{d-t-e}^b$  – lower marginal value of *debt to equity ratio* taking into account financial leverage effect:

$$LM_{d-t-e}^b = UM_{ROA} / ((1 - T) * (ROA - \text{average interest charge})) \quad (6)$$

where:

$UM_{ROA}$  – upper marginal value of *return on assets*, [%];

$T$  – Income tax rate, [%].

$LM_{d-t-e}^c$  – lower marginal value of *debt to equity ratio* taking into account the specific of legislation.

If there is standard for *debt to assets ratio* in national legislation acts, lower marginal value of *debt to equity ratio* is determined by using *debt to equity* and *debt to assets* correlation relationship, as well as regressive and substitution analysis.

In the course of research authors verified objectivity of suggested methodology of financial viability indicators' analysis by testing the insolvent and successful companies involved in the Latvian service industry (Koleda 2011).

#### 4. Theoretical approach to aggregate assessment of financial viability

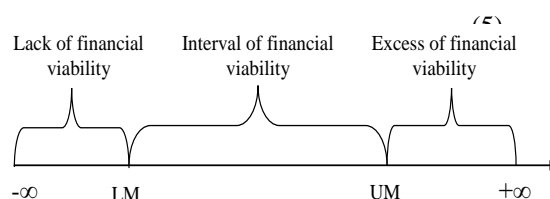
Calculation of the level of adequacy, reserve, excess or lack of the indicators of financial viability is a prerequisite for identifying the average level of company's financial viability in order to further elaboration of the mechanism for managing financial viability.

Distribution of zones of financial viability and values of its indicators among the numerical values depends on how growth or fall in the numerical value of indicator applied for financial viability

analysis influences its level. The inverse or direct dependence impacts the approach to calculation of the standardized values of financial viability indicators, which are necessary for comparability of results of applying the different indicators with different numerical values of lower and upper margins for evaluation aggregate assessment a company's financial viability.

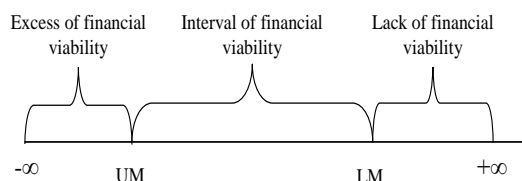
The zones of financial viability among numerical values are defined by two approaches.

1. approach when there is direct dependence between the numerical value of indicator and the level of financial viability.



**Fig.2.** Distribution of financial viability frontiers among the numerical values (I) (Source: created by authors)

2. approach when there is inverse dependence between the numerical value of indicator and the level of financial viability.



**Fig.3.** Distribution of financial viability frontiers among the numerical values (II) (Source: created by authors)

For comparability of results of research on the level of financial viability the standardized values of financial viability should be find out. Standardized value of financial viability ( $IND_i^{st}$ ) is defined as following:

1. If there is direct dependence between the numerical values of indicator and the level of financial viability, then:

$$IND_i^{st} = (IND_i - RZ) / (RA - RZ), \quad (7)$$

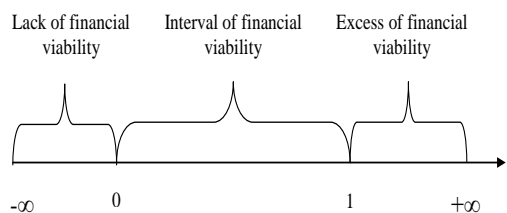
where:

$IND_i^{st}$  – standardized value of financial viability.

2. If there is inverse dependence between the numerical values of indicator and the level of financial viability, then:

$$IND_i^{st} = (RZ - IND_i) / (RZ - RA), \quad (8)$$

After standardization the zones of financial viability are allocated among numerical values as follows:



**Fig.4.** Distribution of financial viability frontiers after standardization among the numerical values (Source: created by authors)

Authors suggest calculating the aggregate assessment of companies' financial viability using the formula:

$$AFV = \sum_{i=1}^j IND_i^{st} / j, \quad (9)$$

where:

*AFV* – aggregate assessment of company's financial viability,

*j* – the number of indicators applied for analysing the level of financial viability,

*l* – financial viability indicator.

The aggregate level of adequacy, lack, excess or reserve of financial viability can be defined in the following way (Table 2):

**Table 2.** Characteristics of level of financial viability

Characteristics of financial viability	Specification of characteristics of financial viability	Formula for calculation of characteristic of financial viability	Description
The level of adequacy (FVal, %)	Such level of financial viability which provides the minimal risk of company's bankruptcy	$AFV * 100\%$	If $FVal > 0$ , sufficient level of financial viability. If $FVal < 0$ , insufficient level of financial viability
The level of lack, %	Insufficient level of financial viability for providing sustainable development of company	$- AFV * 100\%$	Calculated when $FVal < 0$
The level excess, %	Exceed level of financial viability which negatively results company's successful operating	$\frac{AFV - 1}{1} * 100\%$	Calculated when $FVal > 100$

**Table 3.** Marginal values of financial viability indicators of Latvian service companies in 2007–2009 years

Indicators	Actual value			Upper margin			Lower margin		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
Return on equity	0.24	0	-0.18	+∞	+∞	+∞	5.9	4.38	1.92
Return on assets	0.05	0.03	0.01	+∞	+∞	+∞	0.03	0.03	0.02
Return on sales	0.06	0.04	-0.05	+∞	+∞	+∞	0.40	0.91	0.73
Debt-to-equity ratio	3.40	3.42	7.40	0	0	0	4.99	3.27	0.28
Debt service coverage	4.05	1.54	-0.56	+∞	+∞	+∞	1	1	1

End of table 2

The level of reserve, %	Permissible level of decreasing the financial viability	$\frac{AFV - 0}{1} * 100\%$	Calculated when $FVal \in [0;100]$
		1	

Calculation of the level of adequacy, reserve, excess or lack of the aggregate level of financial viability is a prerequisite for identifying the company's potential for sustainable development.

### 5. Aggregate assessment of financial viability of the service companies in Latvia

In the research of financial viability of Latvian enterprises observation selected on a systematic basis was chosen by authors according to the following principles:

1. Industry sector, which has major contribution to Latvian economics, is analyzed - service sector;

2. The most economically active region is chosen for analyses according to the quantity of companies operating in Latvian regions - Rigas region;

3. The sample of statistical information is limited according to the sizes of the companies - SME (CSP 2010);

4. Historical time period of deep crisis 2007–2009 years is selected for testing the suggested approach to aggregate assessment of company's financial viability for understanding the reasons of a company's bankruptcy from today's point of view.

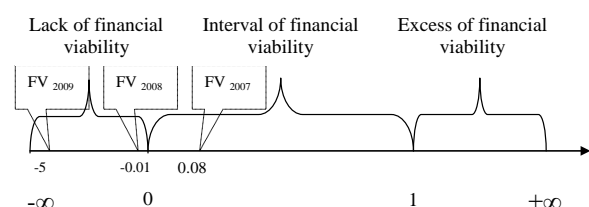
In order for the company to monitor the level of financial viability efficiently, the only calculation of the actual values of financial viability indicators is not enough; it is necessary to find out upper and lower margins of company's financial viability indicators to apply them for aggregate assessment of financial viability.

The authors have calculated standardized values of financial viability indicators of Latvian service companies in 2007–2009 years. See Table 3.

**Table 4.** Standardized values of financial viability indicators of Latvian service companies in 2007–2009 years

Indicators	Standardized values		
	2007 year	2008 year	2009 year
Return on equity	→0	→0	→0
Return on assets	→0	0	→0
Return on sales	→0	→0	→0
Debt-to-equity ratio	0.32	-0.05	-25
Debt service coverage	→0	→0	→0

The authors have calculated an aggregate level of Latvian service companies' financial viability in 2007, 2008 and 2009 years based on the concept of marginal values of financial viability indicators: 1)  $AFV_{2007}=0.08$ ; 2)  $AFV_{2008}=-0.01$ ; 3)  $AFV_{2009}=-5$

**Fig. 5.** Aggregate assessment of companies' financial viability of Latvian service companies in 2007, 2008 and 2009 years (Source: created by authors)

The results of research of financial viability level of Latvian service companies for time period when crisis began till 2009 year show that in 2007 year companies still had a little reserve for development, but the lack of a timely financial viability management resulted in a considerable decrease in potential for sustainable development in 2008 and 2009. Taking into account liquidation process of companies which takes 3 years in average in Latvia (European Commission 2011), the testing of dynamic of level of financial viability of analysed companies in 2007–2009 years allows understand the reasons of a company bankruptcy from 2011 year till today point of view.

## 6. Conclusion

Implementing the suggested by authors approach to aggregate assessment of financial viability of company, allows to timely monitor and control the adequate level of financial viability.

Suggested approach can be considered as an effective tool for controlling company's solvency level, estimating the risk of bankruptcy and choosing best possible alternatives for running economic activities in line with sustainable development

The use of the research results in practice will allow the companies to determine the necessary

levels of changes of factors which influence financial viability in order to achieve sustainable development and as a result to choose an effective financial strategy aimed at viability in the short and long term.

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