

# Business Restructuring as a Method of Strengthening Company's Financial Position

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## Abstract

Restructuring is relevant for companies that have free capital and need to expand for development purposes, as well as for companies that have relatively large problems with financial results and the relevant indicators indicate the necessary changes. Motives of the restructuring may be different, the authors put forward the following reasons: operation operational synergy, financial synergy, diversification, economic motives. Restructuring is one of the key methods for company's financial position strengthening. Motives of restructuring are various, but the objective is company's value increase and the strengthening of financial position. The authors investigate the essence of the company's financial strategy, studied restructuring as a modern approach of company development in the crisis period, as well as the company's valuation and financial analysis methods, which were used for restructuring.

**Keywords:** Business Restructuring, Company's value, Financial position, Financial ratio, Multiple discriminated analysis

## 1. Introduction

In rapidly changing business environment many companies have insufficient financial resources. Restructuring leads to improved financial results and operational performance, so synergies are one of the main motives. Within the research it was found that the goal of restructuring is not always growth, so synergies need to be applied to the goal of growth. Restructuring offers new opportunities for companies, which is to be welcomed from the benefits of such a move. Companies often decide in favor of taking over another company in order to diversify into another business, which allows them to use other technologies as well. Mergers and acquisitions have several options and goals.

In today's business environment, where competition is often very high, companies need to introduce new products and work very hard to maintain their market share. In order for a company to be able to invest in growth, it needs resources - financial and labor resources. Lack of one or both resources hinders the development of the company. In situation of distress, companies have two main options for restructuring to achieve the goal appropriately: do it internally and build on existing development (internal growth can be inefficient and long-lasting, which does not pay off for the company in the long run); expand through M&A (new resources and

technologies can help drive faster and more efficient growth, but there are factors that can influence such a move and are unpredictable).

The growth of a company depends on the market in which the company operates. A company with a slower internal development risks losing its market share when other companies have the opportunity to invest and, as a result, become a market leader. Often, takeovers enable a company to continue operating more efficiently. Operational efficiency plays an important role in the company's growth. Growth performance can be compared in a variety of ways, from revenue and net profit to the use of existing and acquired resources. Motives of restructuring vary significantly, but the objective is company's value increase and the strengthening of financial position. Restructuring is a process of numerous interrelated activities.

The aim of the research is to study the usefulness of restructuring for the company's financial position strengthening by application of methods of financial analysis and forecasting.

The authors conclude that restructuring is a process aimed at maximizing the value of the company by introducing methods to improve the company's financial performance.

Quantitative and qualitative methods of scientific research were used, such as critical analysis of literature, induction

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and deduction, analysis and synthesis, logically constructive and statistical methods, financial modeling.

## 2. Literature Review

The financial situation of a company plays an important role in conducting business, which can affect its operations both in the long and short term. Any of the restructuring objectives include company analysis, risk assessment, valuation. Financial analysis and analysis of the overall company is an essential part of determining the value of the company and assessing the contribution of restructuring.

Enactment of strategically significant decisions is at first related to attracting financial resources, respectively, to the quality of financial management in a company (Mavlutova, 2012). The key component of financial management is the financial strategy or business policy in the directions of financial development, which includes the system of financial performance goals and setting of priorities in the long run.

Questions related to financial strategy are explored in researches of E. Brigham, M. Ehrhardt, R. Fox (2016), G. Arnold, D. Lewis (2019).

The authors conclude that the reasons for restructuring may be different, but according to the authors, the most important financial reasons are risk sharing and additional funds that can be used in the development of the company. For operational reasons, according to the authors, the most important are the opportunity to create new products and, as a result, to develop and reduce dependence on the revenue of one product, as well as the opportunity to expand the existing market area and gain a larger customer base and revenue. Often, such a step is cheaper than investing extra money in marketing activities to gain new customers. It is important to understand that a move for the restructuring can have negative consequences if it is not thought through. The goal of the restructuring is growth, but companies often take the opportunity to restructure their operations, thus abandoning business lines that are not the main sources of income and do not create as much added value, thus being able to focus on the core business. Nowadays, there are cases when companies merge in order not to be taken over by another investor or competitor. Looking at the possible restructuring goals, the authors conclude that the benefits of restructuring activities can be relatively large, but companies need to assess the basis of the restructuring and what the end result will be for the company. The costs of the restructuring must not be inadequately high, on the contrary, the company may have difficulty in creating synergies in order to recoup the invested funds (Mayer and Lixl, 2019).

Analyzing both external and internal factors, restructuring includes improving the company's strategic, financial, operational, marketing system, personnel, quality management and innovation management, and the introduction of information and communication systems in the digital age.

Company's insufficient efficiency can be considered as the main reason for restructuring, the role of restructuring in the viability of companies was studied by A. C. Moreira, P. Silva (1998), A.A. Zakirova, V.A. Dubolazov (2019), S. Mayr, D. Lixl (2018), N. N. Thang (2019), R. Gudivada Venkat, L. Bullayya (2014).

Together with more detailed examination it is noted that the term "company's restructuring" doesn't refer only to the activities changing the organizational structure of the company. It can outline the whole set of problems that companies face.

The authors consider it necessary to indicate the classification of the types of restructuring of the company and have justified different restructuring rules. The authors agree with Damodaran and note the following types of restructuring: mergers, acquisitions, strategic alliances, property restructuring, actions to address financial difficulties (Damodaran, 2009)

These types of restructuring are related to company's financial strategy (Sharpe, 2008). No matter how formal the motives of company's restructuring are, its real objective is gaining additional effect (effect of synergy) (Global M&A Outlook, 2019; Kaetzler et al., 2019; Bahram, 2011).

During examination of several Latvian and foreign expert conclusions, the authors have concluded that during the process of restructuring the most appropriate concept for evaluating company's value is the income concept which includes two techniques: capitalization of earnings and discounting the future cash flows (DCF) (Olaru and Capatina, 2011; Kropivsek et al., 2019; Needles, 2005; Ross et al., 2012; Bobileva, 2004).

The financial management theory determines such main cash attraction sources for business purchasing transactions as equity and borrowed capital (Damodaran, 2008; Beaver, 1967). The price of the borrowed capital can be determined as follows (1):

*The price of the borrowed capital = Income from the bonds*

$$+ \text{Premium of company's credit risk} \quad (1)$$

The equity price can be calculated with:

- 1) Dividend discounting model.
- 2) Capital asset pricing model (CAPM) (Sharpe, 2008).

The authors have chosen company's value as a restructuring criteria due to investment efficiency criteria is permanent growth of investment value.

Company's value should be evaluated within business valuation (Altman, 2000). By authors, the most appropriate is the Discounted Cash Flows method (White et al., 1994). The cash flow indicators take into account all the decisions related to company 's economical, investment and financial activity.

The DCF pattern can be expressed as:

$$V = \sum_{t=1}^{\tau} \frac{CF_t}{(1+r)^{(t-0.5)}} + \frac{V_{ad}}{(1+r)^{\tau}} \quad (2)$$

where:

t – year for predictions,  
 T – calculating horizon,  
 r – discount rate,  
 CF<sub>n</sub> – cash flow during period n,  
 Vat<sub>l</sub> – terminal value outside the calculating period for predictions.

### 3. Results and Discussion

#### 3.1. Business restructuring as a method company's strategic management

Different scenarios for restructuring economic, investment and financial activities need to be developed, taking into account traditional restructuring objectives such as increasing the value of the company. (Springate, 1978). The deep analysis about the structure of goods and services, pricing, profitability, markets, advertising, sales and after-sales services has to be provided (Tafler, 1984). The investment factors that determine the direction of value creation can include: working capital management and workforce capital optimization. There is a need to analyze supply, debtors and liabilities, capacity building, capital planning and asset sales (Alaminos et al., 2016). The value of equity, the ratio of equity to debt, capital structure is included in the analysis as financial factors. The developed activities were inspected with the use of company's valuation model. The strategy aimed at increasing the company's value is considered as a ground for restructuring alternative consideration described subsequently.

Restructuring strategies have to be reviewed from the alternatives anticipating minimal capital investment and external funding to the investment projects renewing the technologies of goods and services provided (Ferreira et al., 2016). However, the authors point out that many companies experience the situation where the most important is to repay obligations with high level of financial risk. It often does not conform to company's value maximization. (Gordini, 2014).

The authors believe is necessary to develop of the restructuring model that is linked to the needs of the strengthening of company's financial position and successful development (Henrih and Voronova, 2009).

The model proposed by the authors for problem solving described in Figure 1 contains a chain of feedbacks, which allows to adjust goals and tasks in order to assess and strengthen the financial position of the company. The starting point of the model development is defining company's restructuring motives and mission.

The company's restructuring as strategic management tool is related to high-risk level (Begley et al., 1996; Lennox, 1999; Perevozova et al., 2019). The failures of restructuring have been analyzed and the factors affecting them have been identified, such as increased labor volatility, lack of strategy, inadequate cost estimation, deliberate objective assessment, lack of necessary control, slow decision-making and uncertainty of boundaries, barriers due to cultural differences and lack of management experience (Li and Wang, 2014).

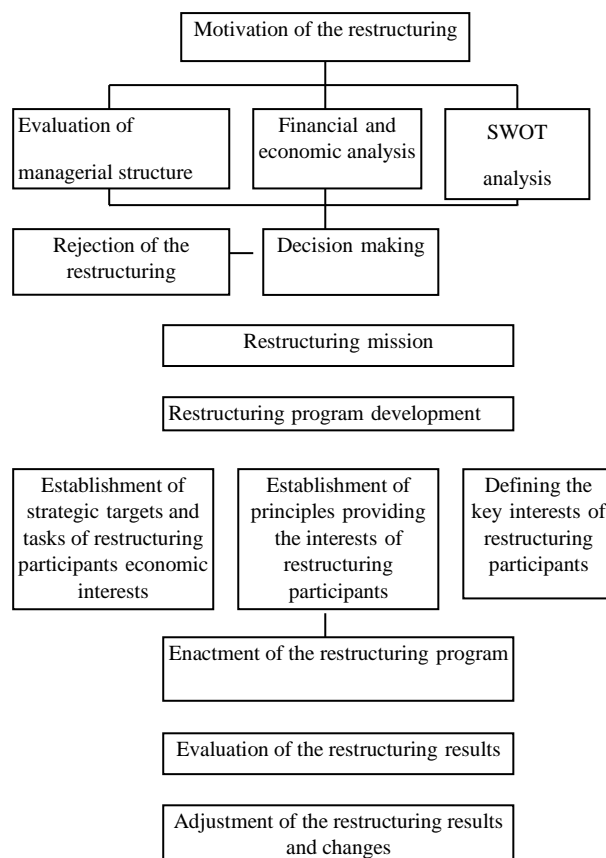


Fig. 1. Business restructuring model  
 Source: compiled by the authors based on (Mavlutova, 2012)

#### 3.2. Financial analysis for company's position assessment

The company's return on equity or profitability considerably shows how effective are usage of owners invested capital to gain the profit (Chesser, 1974). Return on sales shows remaining share of income, the company's managers can see as the profit from each euro, received from the sales. Thereby this profitability ratio shows effectiveness of company business activity. (Korol, 2011).

Table 1  
 The main financial indicators used in strategic financial analysis

Ratio	Formula
Return on equity, ROE	$\frac{\text{Net profit} \times 100}{\text{Equity}}$
Pretax margin, ROS	$\frac{\text{Earnings before taxes} \times 100}{\text{Net turnover}}$
Stock turnover	$\frac{\text{Net turnover}}{\text{Stocks}}$
Debtor turnover	$\frac{\text{Net turnover}}{\text{Debtors}}$
Days of sales outstanding, DSO	$\frac{\text{Debtors} \times 360}{\text{Net turnover}}$
Turnover Ratio of long-term investments	$\frac{\text{Net turnover}}{\text{Long-term investments}}$
Total liquidity ratio	$\frac{\text{Current assets}}{\text{Short term debts}}$
Debt-to-capital, DR	$\frac{\text{Liabilities}}{\text{Liabilities} + \text{Equity}}$

In order to evaluate financial position of the company more precise within the capital perspective, ratios mentioned above must be supplemented by additional indicators from Table 2 measures in a manner and to the extent that ensure the effective minimization of such risks, depending on their level (Davydenko et al., 2019).

Banks are subjects of initial financial monitoring. Using a RBA as a mechanism to AML/CFT, as well as to prevent risky activity, the bank independently determines the relevant indicators and the list of clients not subject to enhanced financial monitoring measures. The main tasks of banks as subjects The essence of liquidity ratio is to evaluate potential ability of the company to pay current liabilities by using working capital (Perevozova et al., 2019). Analysing dynamics of this ratio, factors that create mentioned changes must be studied. For instance, if a growth of the liquidity ratio was mainly connected with unreasonable accounts receivable, it cannot characterize company business performance positively. Liabilities indicators reflect company dependence from borrowed capital and characterize relations between its owners and creditors (Perevozova et al., 2019).

Table 2  
Additional financial indicators used in strategic financial analysis

Ratio	Formula
Quick liquidity ratio, QR	$\frac{\text{Cash} + \text{Short term capital inv.} + \text{Debtors}}{\text{Short term liabilities}}$
Debt liabilities towards capital, DR	$\frac{\text{Liabilities}}{\text{Liabilities} + \text{Equity}}$
Interest payment coverage ratio, ICR	$\frac{\text{Profit before interest and taxes}}{\text{Interest payments}}$
Cash ratio	$\frac{\text{Cash}}{\text{Short term liabilities}}$
Working capital, WC	$\frac{\text{Current assets} - \text{Current liabilities}}{\text{Current assets}}$
Productivity	$\frac{\text{Net sales}}{\text{Employees}}$

In order to evaluate the influence of the factors that reflect the financial position and performance of the company, usually a modified DuPont model is used:

$$K = \frac{P^a}{P} \times \frac{P}{NA} \times \frac{NA}{BK} \times \frac{BK}{PK} \times 100\% \quad (3)$$

where:

$\frac{P^a}{P}$  – describes the company’s dividend policy which is shown as a ratio of dividends paid versus the profit reinvested in the development of production;

$\frac{P}{NA}$  – describes the profitability of the sold product (services);

$\frac{NA}{BK}$  – describes the return of resources;

$\frac{BK}{PK}$  – financial leverage, which describes the ratio of balance sheet amount versus the equity.

This model reflects the influence on the ratios of financial stability by both, the company’s economic activity (second and third factor), and its financial stability (first and fourth factor) [51, 52]. Furthermore, the company has the possibility to use certain leverages in order to influence the increase of such indicators – decreasing the amount of dividends to be paid, increasing the return of resources, increasing the profitability of the product and services, seeking possibilities to receive favorable loans.

The proposed model may be extended by adding important indicators which describe the company’s financial position: sufficiency of current assets, liquidity, turnover of current assets, short-term liabilities.

The extended model of factors for determining the economic growth indicator of company is the following:

$$K = \frac{P^a}{P} \times \frac{P}{NA} \times \frac{NA}{WK} \times \frac{WK}{AL} \times \frac{AL}{IK} \times \frac{IK}{BK} \times \frac{BK}{PK} \times 100\% \quad (4)$$

where,

$\frac{P^a}{P}$  – part of profit which is reinvested in development an

which is determined as a ratio of the profit allocated to development of the company versus the net profit;

$\frac{P}{NA}$  – profitability of the product (services) sold,

determined as ratio of net profit versus net returns;

$\frac{NA}{WK}$  – return on working capital, determines as ratio of

net returns (of products, services) versus the amount of own current assets;

$\frac{WK}{AL}$  – working capital sufficiency, determined as ratio of

own current assets versus the all current assets;

$\frac{AL}{IK}$  – current liquidity ratio, determined as ratio of

current assets versus short-term liabilities;

$\frac{IK}{BK}$  – the share of short-term liabilities in the company’s

capital, determined as ratio of the short-term liabilities versus the total balance sheet;

$\frac{BK}{PK}$  – financial leverage, determined as ratio of the total

balance sheet versus the equity.

The analysis of the factors of economic growth ratios is based on the data of the company’s annual report. Applying the multi-factor model of this ratio essentially means forecasting the level of development of the company, considering the risk of bankruptcy. Bankruptcy is a regular consequence of unsuccessful business management. The possibility of bankruptcy can be determined with a high degree of probability by existing methods of forecasting and financial managers may face a task to identify the most appropriate method for prognostication of eventual bankruptcy in particular circumstances.

There are three ways in the contemporary practice of prognostication of the stable financial position with regard to an eventual bankruptcy:

applying a system of criteria and indicators for diagnostics of possible bankruptcy; computation of the universal solvency index; computation of indicators characterizing structure of balance.

Company's solvency is one of the most important financial ratio perspectives, professional solvency management ensures sound operations and further company's development. Solvency is defined as the ability of company to cover all obligations in long- term and short-term perspectives. Solvent company is able to continue operations into the predictable future. Each company should be regularly monitored in order to determine signs of possible insolvency, to be able perform actions such as restructuring to avoid it. Additionally, it is necessary to determine factors affecting financial position of a company to be able to understand their possible adverse effect on its solvency and take corrective actions if needed (Needles, 2005).

Evaluation of solvency of a company should be based on various elements of annual reports, financial ratio analysis and solvency forecasting methodologies. Factors affecting solvency are divided into internal and external factors.

Finance practitioner S.Ross (2012) has systematized indicators that may indicate a deterioration in a company's financial position. He has divided internal factors into three groups: related to operational activities, related to investment activities and related to financing activities (Katan et al., 2018). American scientist G. Newton (2003) has determined key external factors affecting company's financial position such as economic changes, competitive environment, government regulations and technological changes.

E. Altman (2019), professor of the University of New York, defined solvency as a state when cash flow of a company is enough to cover short term obligations as well as company's assets of exceed its obligations (positive equity) (Ferreira et al., 2016). American economist D. Chorafas (2001) considered company as solvent when the largest share of its assets is enough to cover all its liabilities. Lithuanian professor J.Mackevicius (1998) defined solvency as ability of a company to cover all liabilities with current financial resources timely. Russian author and economist A.Bobileva (2004) assumed solvency as ability to meet all financial obligations in time (Springate, 1978; Shkodina et al., 2019).

The authors came to the conclusion that in general economists and scientists define solvency as the ability of a company to meet all its short-term and long-term liabilities using current financial resources, as well as the ability to generate sufficient resources to service obligations on time.

In order to keep company solvent, it should be managed properly. Solvency management implies evaluation of signs, causes and affecting factors of solvency, as well as monitoring, analysis and forecasting of financial ratio and development of methodologies for maintaining solvency and improving financial position of distressed companies.

Company's solvency is highly dependent on the effectiveness of utilization of its financial resources. The goal of financial analysis is to define and evaluate factors, which can negatively affect company's financial position (Bobileva, 2004).

Financial analysis consists of following steps:

Step 1. Introduction to company's accounting policies, for example methodologies for stock accounting, direct and indirect costs calculation, as well as methods of evaluation of costs of separate products. This step implies information gathering and express analysis of financial statements.

Step 2. The second step involves processing the financial statements in a way that allows analysis of the liquidity, solvency and profitability ratios, as well as the intensity of capital investment and the level of financial risk. The data analysis is based on a system of financial ratios.

Step 3. Detection of trends in the company's development based on dynamics of company's activities financial results.

Step 4. Description of development dynamics and reasons of structural changes, as well as development of suggestions for reduction of the influence of adverse factors in the future.

The usage of financial ratios is essential for forecasting, evaluating actual results and comparing them. Conducting financial analysis, financial analysts should pay attention to projected financial results as well as underlying assumptions. The main financial ratios to consider company's solvency are the following (Katan et al., 2018):

$$\text{Debt service coverage ratio (DSCR)} = \frac{\text{EBITDA}}{\text{Annual loans payments}}, \quad (5)$$

where:

*EBITDA* – earnings before interest, tax, depreciation and amortization

The ratio illustrates company's ability to service debt obligations from profit (*EBITDA*). The ratio should exceed one.

*Net Debt/ EBITDA* – the ratio illustrates debt burden of a company in relation to profitability.

In the case when proper management actions to maintain and improve financial position of the company aren't taken, there is a threat of company becoming insolvent. There are two states of insolvency – analytical or actual insolvency and legal insolvency. Legal insolvency is the one declared by court when a company defaults on its obligations. Analytical insolvency is related to company not being able to service its obligations based on information on its financial position of financial statements. This type of insolvency could be recovered by financial management actions.

Company's solvency forecasts are based on balance sheet, profit and loss statement and cash flow statement, as well as financial ratios, various additional indicators and solvency forecasting models are applied. However, computation of financial ratios, tracking of their changes and comparison to other companies alone does not

provide full information regarding the level of possibility of insolvency and default. More precise evaluation of probability of insolvency is derived using solvency forecasting models based on combinations of financial ratios.

Analysts always have tried to foresee bankruptcy on the ground of the numerical ratios or a generalized indicator. In the sixties of the 20th century, William Beaver (Beaver, 1967) made a first attempt to systemize ratios reflecting probability for bankruptcies of companies. He identified the ratios dynamics of which showed signs of bankruptcy. By analyzing the tendency of changes in financial indicators and applying the scale of critical values, the company in question could be related to a certain group of risk.

Further, solvency forecasting models have been studied by Edward Altman (2000), J. Fulmer, G. White, A. Sondhi, D. Fried (1994); Canadian economist G. Springate (1978), R. Tafler from Great Britain (1984), D. Alaminos (2016), S. Ferreira (2016), N. Gordini (2014), as well as the issue was studied by I. Voronova, I. Genrih (2009), I. Mavlutova (2012) and others in the world and Latvia.

The most famous author of solvency forecasting models Edward Altman used different combinations of financial ratios and first applied multiple discriminant analysis (MDA) (Ferreira et al., 2016). Financial ratios included in the model were divided in four groups – liquidity, profitability, solvency and efficiency. For each group the model included the most important financial ratios with the largest difference between solvent and defaulting enterprises. As a result, multifactor regression was created – Z model:

$$Z = 1,2 X_1 + 1,4 X_2 + 3,3 X_3 + 0,6 X_4 + 0,999 X_5, (6)$$

where:

$X_1$  – working capital / total assets;

$X_2$  – retained earnings / total assets;

$X_3$  – earnings before interest and taxes / total assets;

$X_4$  – share capital market value / liabilities;

$X_5$  – net turnover / total assets.

In order to work out the pattern Altman studied a large number of companies in the US, taking into account 22 financial ratios relating to the evaluation of eventual bankruptcy. During the study, five ratios were identified that are of most importance for predicting bankruptcy. They were weighted on the basis of an assessment of the parameters based on the statistical processing of the selected companies. Testing Z-model, E. Altman concluded that model is capable of predicting insolvency one to five years ahead. The closer to the default, the higher predictive power the model has: one year before

insolvency its predictive power is close to 95%, while five years before only 36%.

E. Altman has derived insolvency possibility scale based on Z-score value:

Up to 1,8 – very high probability of insolvency

From 1,8 to 2,7 – high probability of insolvency

From 2,8 to 2,9 – average probability of insolvency

More than 3,0 – very low probability of insolvency.

Regardless of the benefits of the mode, its application is complicated due to omission of country related and industry specific factors, as well as the model is designed for public companies. Therefore, modified models based entirely on financial ratios from financial statements have been derived. E. Altman has created Z' and Z'' models for non-public companies:

Z' – for large industrial companies;

Z'' – for small companies in various industries.

At the Riga Technical University Z-pattern was developed for prognostications indicating the possibility of bankruptcy to be made accordingly to the circumstances of Latvia, but, as consider its authors, it does not take into account peculiarities of industries and is worked out, basing upon a small selection of companies (Henrih & Voronova, 2009):

$$Z = -2,4 + 2,5K_1 + 3,5K_2 + 4,4K_3 + 0,45K_4 + 0,7K_5 (7)$$

where

$K_1$  - net current assets / total assets;

$K_2$  - retained earnings / total assets;

$K_3$  - earnings before taxes / total assets;

$K_4$  -equity / total debts;

$K_5$  -net turnover / total assets.

The prognostication indicating probability of bankruptcy depends on quantity of Z:

$Z < 1,80$  – extremely high possibility of bankruptcy;

$1,81 < Z < 2,7$  – bankruptcy is possible;

$Z > 3,00$  – possibility of bankruptcy is not prospective or it is very low.

Other economists from around the world have developed MDA models. British economists R. Tafler and H. Tishow (1984) have created four factor model, American economist G. Fulmer developed nine factor model, Canadian economist G. Springate (1978) has developed four factor model, however one of the best known solvency models for transition economies is five factor model by economists from Lomonosov Moscow State University R. Saifulin and G. Kadikov. Analyzing these models, it could be concluded that model structure is mostly common and the models include ratios of liquidity, liabilities, profitability and activity (Mavlutova, 2012) (see Table 3) (Perevozova et al., 2019; Chesser, 1974).

Table 3  
Financial ratio included in most popular solvency forecasting models

Included financial ratio	E. Altman Z	E. Altman Z''	R.Tafler H. Tishow Z	D. Fulmer H	G. Springate Z	R.Saifujin G. Kadikov R
Working capital / total assets	x	x			x	
Retained earnings / total assets	x	x		x		
Earnings before interest and taxes / total assets	x	x			x	
Equity / liabilities	x	x				
Net turnover / total assets	x		x	x	x	
Current liabilities / assets			x	x		
Liabilities / assets				x		
Current assets / current liabilities						x
Earnings before tax / current liabilities			x		x	
Current assets / liabilities			x			
Earnings before tax / equity				x		
Cash flow / liabilities				x		
Fixed assets / total assets				x		
Current assets / liabilities				x		
Earnings before interest and taxes/interest payments				x		
Working capital						x
Asset turnover ratio						x
Net profit / net turnover						x
Net profit / equity						x

Nowadays, although it is not comprehensive, it is possible and necessary to apply a system of criteria for diagnosing potential bankruptcies. Given the varying degrees of criteria, it is always problematic to determine how and what criteria are sufficient to anticipate potential bankruptcy. To avoid subjectivity in business valuation, it is primarily necessary to rely on audit experience and apply a system of criteria such as a preliminary signal system for more detailed case analysis.

The following shows the two-stage criteria and signs of system for failure probability prediction according to the practice of the he Audit Practice Committee (UK) recommendations (see Table V). It should be noted as one or the other criterion or groups of criteria appearance does

not provide a basis for the management of the final decision.

Financial managers have to decide which tool is better to prognosticate the probability of bankruptcy. Previously discussed patterns are practiced most frequently, but there, of course, are much more. In the course of applying Z-patterns for evaluation of business, perhaps, it will turn out that while one pattern overestimates the risk of bankruptcy the other underestimates it. In that case there are alternative ways of using Z-pattern, such as:

- 1) working out a multi-factor pattern of your own by applying the MDA method;
- 2) putting into practice the existing available patterns and making generalized evaluation in the light of previous results.

Table 4  
Two-stage system of criteria for prognostication of company's bankruptcy

<p>The following indicates and criteria suggest possible financial issues and possibility of bankruptcy in the near future.</p>	<p>Serious, recurring losses in basic activity (steady fall in volume of production; declining volume of sales; continuously negative profitability)                  Regular overdue payments to creditors and regular overdue payments of debts by debtors                  Excessive use of short-term credit resources for long-term financing needs                  Low liquidity indicators                  Increase in proportion of borrowed capital                  Shortage of own working capital                  Continuous increase of capital turnover period                  Excessive stocks of raw materials and finished products                  Wrong reinvestment and dividends policy                  Regular default of repayment of loans and payments of interests                  Worsening relations with credit institutions                  Applying new sources of financing on disadvantageous terms                  Exploitation of physically and morally outdated equipment                  Unfavorable changes in the portfolio of orders                  Fall in market value of a company's shares</p>
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	Declining production potential
Unfavorable influence of the following indicators is not necessarily a foundation to consider the existing financial position to be critical, but it may as well deteriorate if appropriate steps are not taken in the future	Low degree of diversification of a business activity Loss of the most important contractors Underestimation of the necessity to renew equipment and technology Forced idle time and breaches in the rhythmical pace of the technological production process Overestimated effectiveness of new projects Implication in trials without predictable outcome for a business Loss of competent managerial staff Ineffective long-term agreements Shortage of investments High political risk

The first way includes statistical processing of data bases in major companies. As concerns the second one, it should be underlined that it is obligatory to determine critical value Z in all Z-patterns. Deviations to one side or another will indicate the possibility of bankrupt or its absence, besides, the larger is the distance, the higher is the level of credibility. Thus, it is possible – within any pattern – to create the scale indicating the possibility of bankruptcy, and in the classical pattern of Altman, for example, it looks like this (see Fig. 2):

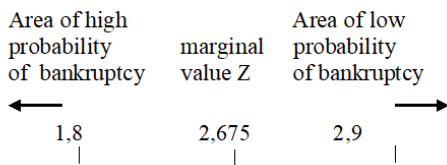


Fig. 2. The scale indicating the possibility of bankruptcy according to the classical pattern of Altman

To every pattern of Z it is own scale with particular parts of this scale. The hardest is respective comparison of different scales in different models. Using statistical indicators and performing this task, it is possible to create universal instrument for prognostication of eventual bankruptcy. The drawback of it is number and complexity of calculations, using available Z models.

Several specialized models for solvency forecasting have been created in the latest years. All available solvency forecasting models could be classified in following groups:

- o models based on multiplicative discriminant analysis;
- o models based on logarithmic regressions (or logit-models);
- o models based on scoring approach;
- o models based on rating valuations.

Due to a number of shortages of multiplicative discriminant solvency forecasting models, many economists switched in favor of other modern approaches to solvency forecasting, including models based on logarithmic regressions (logit models) (Begley, 1996).

Logarithmic regression model is applied in order to solve the task of forecasting value of constantly dependents variable, which can be between 0 and 1. Due to specifics of the variable it is often used as an estimate of the probability of an event dependents of a number of factors. In comparison to MDA models, which can only determine qualitative probability of default, logit models do not have

the problem of interpretation of the result, as it is bounded between 0 and 1, and therefore determines nominal value of probability of default. In addition, there is no uncertainty area in logit models, which is attributable to discriminant analysis models. If probability of default takes values of more than 0,5 event of default is considered as likely. Expert performing company's financial analysis can subjectively define the value of this border [48]. Probability of default in the logit model is calculated based of logarithmic function:

$$P = \frac{1}{1 + e^Y}, \tag{8}$$

where

P – probability of default between 0 and 1;

e – natural logarithmic base (equal to 2,71828);

Y - indicator – integral ratio which is calculated based on model specification.

D. Cesser (1974) designed company's default probability valuation model. Mathematics applied by D. Cesser in his model is very similar to those used by other economists for models described above. In his model D. Cesser calculates integral ratio Y based on six variables representing company's liquidity, profitability and stable financial position factors:

$$Y = -2,0434 - 5,24 X_1 + 0,0053 X_2 - 6,6507 X_3 + 4,4009 X_4 - 0,0791 X_5 - 0,1220 X_6, \tag{9}$$

where

X<sub>1</sub> – cash and cash equivalents as a share of total assets;

X<sub>2</sub> – sales as a share of cash and cash equivalents;

X<sub>3</sub> – gross profit as a share of total assets;

X<sub>4</sub> – borrowed funds as a share of total assets;

X<sub>5</sub> – share capital as a share of net assets;

X<sub>6</sub> – working capital as a share of turnover.

Integral ratio Y is then used for calculation of the probability of default, as in all similar logit models (in Cesser model – probability of default on loan obligations). Interpretation of the quantitative result for probability of default is performed based on following intervals:

P < 0,5, then probability of default is low;

P > 0,5, then probability of default is high;

P = 0,5, interpretation is subject to expert opinion.

Ohlson model is illustrated in the Table 5.



Table 5  
The most popular default forecasting models based on logit regression analysis

Model author (year)	Country, sample size (period)	Integral ration formula
Ohlson (1980)	USA, 2163 (1970-1976)	$Y = -1,32 - 0,407 \times SIZE - 6,03 \times TLTA - 1,43 \times WCTA + 0,0757 \times CLCA - 2,37 \times NITA - 1,83 \times FUTL + 0,285 \times INTWO - 1,72 \times OENEG - 0,521 \times CHIN$
Begley, Ming, Watts (1996)	USA	$Y = -1,249 - 0,211 \times SIZE - 2,262 \times TLTA - 3,451 \times WCTA - 0,293 \times CLCA - 0,907 \times OENEG + 1,080 \times NITA - 0,838 \times FUTL + 1,266 \times INTWO - 0,960 \times CHIN$
Joo-Ha, Taehong (2000)	South Korea, 46 (1997-1998)	$Y = 0,1062 \times INT / TR - 0,00682 \times EBIT / TL - 0,1139 \times TR / REC$
Ginoglou, Agorastos (2002)	Greece, 40 (1981-1985)	$Y = -0,138 + 16,555 \times NP / AT + 3,54 \times GP / AT + 0,002 \times TL / EQ + 0,789 \times (AC - SL) / AT$
Gruszczynski (2003)	Poland, 46 (1995)	$Y = 1,3508 + 7,5153 \times OP / AT - 6,1903 \times TL / AT$
Lin, Piesse (2004)	United Kingdom, 77 (1985-1995)	$Y = -0,2 - 0,33 \times NP / AT - 0,17 \times CASH / TL - 0,95 \times (AC - SL) / AT$
Altman, Sabato (2007)	USA, 432 (2003-2004)	$Y = 4,28 + 0,18 \times EBIT / AT - 0,01 \times SL / EQ + 0,08 \times NP / AT + 0,02 \times CASH / AT + 0,19 \times EBIT / INT$

Source: compiled by the authors based on (Korol, 2011)

where:

SIZE – size of a company, which is calculated as natural logarithm of total assets divided by GDP deflator;  
 TLTA – total liabilities as share of total assets;  
 WCTA – working capital as share of total assets;  
 CLCA – current liabilities as share of current assets;  
 NITA – return on assets;  
 FUTL – working capital as share of total liabilities;  
 INTWO – dummy variable, which takes value 1 if enterprise net profit was negative two last years, and 0 in the other case;  
 OENEG – dummy variable, which takes value 1 if current liabilities exceed current assets and 0 in the other case;  
 CHIN – change of net profits during last two years;

$$CHIN = \frac{NI_t - NI_{t-1}}{|NI_t| + |NI_{t-1}|} \quad (10)$$

where:

NT<sub>t</sub> - net profit in period t.  
 AC – current assets;  
 AT – total assets;  
 TL – total liabilities;  
 SL – current liabilities;  
 LL – long- term liabilities;  
 EQ – equity;  
 REC – debtors;  
 TR – net turnover;  
 NP – net profit;  
 GP – gross profit;  
 OP – profit before tax;

INT – interest payments;

OC – administrative and sales expenses;

EBIT – earnings before interest and taxes;

CASH – cash.

Latvian economists I. Genriha and I. Voronova (2009) have developed new default forecasting model for Latvian enterprises using regression analysis based on three financial ratios:

$$Z = 25,998K_1 + 33,358K_2 + 16,208K_3 - 5,662, \quad (11)$$

where:

K<sub>1</sub> – Profit before tax / Equity;

K<sub>2</sub> – Net turnover / Assets;

K<sub>3</sub> – Long-term liabilities / Assets;

$$PD_i = \frac{1}{(1 + e^{-Z})}, \quad (12)$$

where:

PD<sub>i</sub> – probability of default in a year;

e – natural logarithmic base (equal to 2,71828);

Z - Score based on the weights of regression model.

The model calculates probability of default, which estimates company's probability becoming insolvent in one year. The model shows better predictive power with respect to Latvian companies compared to other models. For smoothing of different results from different models, it is possible to use methods of average values, weighted

averages or average quadratic deviation. In every case, the result of such approach is going to be more precise (Katan, et al., 2018), if compared to any individual method or model.

The high number of unsuccessful restructuring cases does not diminish the number of restructuring projects carried out because of their potential advantages over traditional methods of strengthening the financial position of companies. It is therefore necessary to identify the causes of the failure and to assess the risks of implementing the restructuring, as well as the financial performance of the company and the risk of bankruptcy during the restructuring.

When evaluate the value of a company, the authors conclude that the most commonly used method for determining adapted capital assets or the cumulative method used by Latvian financial analysts does not reflect an adequate price for increased financial risk. In order to determine an appropriate capital price linked to the growing financial risk, as well as with more aggressive financing structures, the authors propose using the capital assets pricing model (CAPM).

#### 4. Conclusion

The crisis is a complex financial situation that threatens the company's existence and requires certain activities to restore and restore balance. It is unlikely that a temporary slowdown in economic activity following a cycle of development and rotation with increasing phases will lead to significant operational and operational gaps that can even fully change in terms of company ownership, management, personnel and technical issues.

In order to prevent the crisis, the financial situation of the company should be assessed in good time and the company should be reopened in the event of an unsafe situation. One of the main parts of the system is the restructuring of the company.

Initiating the restructuring, the company's financial indicators and performance should be assessed using methods of the strategic financial analysis. The information obtained with the data of closest rivals and determines the company's position in the industry by performing the analysis of company's external environment should be compared. Various methods of financial analysis could be useful for the evaluation of financial position. These methods differ taking into account complexity and amount of information. The model of analysis should be based on the following financial indicators - solvency, profitability as well as working capital and liability.

Solvency is related to the ability of the company to service timely its obligations from its assets. It is the ability to maintain the operating activity, which generates enough financial resources to service all its obligations. Solvency is closely related to liquidity, financial stability and potential bankruptcy. Company's solvency is affected by external (economic and demographic changes, governmental restrictions, etc.) and internal (lack of

management experience, unjustified decisions, incorrect human resource management, etc.) factors.

In order to better predict potential bankruptcy, a whole set of methods must be used and, based on their results, recommendations for management decisions and the need for restructuring must be developed. The authors suggest the application of several bankruptcy identification methodologies, based on the company's size and the specifics of operations, and definitely applying models based on logarithmic regressions.

Solvency management includes the determination of the factors affecting solvency, evaluation and the analysis of financial statements and ratios, as well as their forecasting and management, and the development of the methods of maintenance and improvement of financial stability.

One of the most critical stages in restructuring is the forecasts of future activity. The investment decision must be based on the quality and objectivity of the forecasts made. In order to expected cash flow being objective, the assumptions made should be based not only on company's future perspectives on micro level, but also on the statistics of country's macroeconomic indicators and the expert opinions about country's development.

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