

THE IMPORTANCE OF ASSESSING THE RISK OF BANKRUPTCY UNDER THE CURRENT GLOBAL CRISIS

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Abstract: *Like any evolutionary system, market economy is not without tensions, being confronted with internal and external destabilising factors. This study defines the risk of bankruptcy and also includes the models for evaluating a company's bankruptcy risk. An economic and financial analysis is presented as the most appropriate to identify the bankruptcy risk, the calculation and interpretation of the dynamic financial phenomena.*

Key words: *market economy, bankruptcy risk, liquidity, solvability, financial balance.*

1. Introduction

The issue of risk and generally of uncertainty has concerned the world of experts and practitioners and ordinary people since ancient times. Usually, security is associated with certainty and a worsening situation with the risk or uncertainty.

Market economy like any evolutionary system is not without internal tensions, shocks and disruptive events. Once Romania integrated into the EU, the companies from our country had to adapt on the fly to the requirements of this new macro system. The emergence of the current global financial crisis made the new EU Members feel many disturbing factors, while attempting to implement European economic policies. Following the confrontation with different risks, many companies became insolvent.

2. Definitions, Objectives, Research Methodology

The aim of this paper is to define and present ways of assessing risk of bankruptcy and the importance of this process under the conditions of potential tensions and problems caused to the companies from the new EU member states by the global financial crisis.

The imperative to make decisions on market economic conditions, especially in the current period of financial crisis, creates special problems for managers, their tasks becoming more and more difficult as the information about the competitive environment in which companies operate presents enough uncertainties. As a result, there is a need to involve risk assessment in the calculations of the companies' financial statements. One of these risks is *the risk of bankruptcy*.

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2.1. Defining the Risk of Bankruptcy

Risk of bankruptcy can be defined as an inability of companies to deal with outstanding payments, i.e. their inability to repay the borrowed sums on time as determined by mutual agreement with third parties under an economical contract or credit.

The permanence of difficulties in discharging obligations is an expression of economic and financial structural fragility. They can generate a restriction of activity, a reduction of the employees' number, a restructuring of the managerial system or, in serious cases, the company's bankruptcy.

As a result, the process of diagnosis of bankruptcy risk is to assess the company's ability to meet commitments to third parties or, directly, to the company's solvency assessment. The risk of bankruptcy matters for both the investors and for that company's managers.

Bankruptcy risk analysis can be done by the following methods:

- analysis of liquidity and solvency;
- financial stability analysis;
- models of static analysis of bankruptcy risk (the score method).

2.2. Research Methodology

Economic analysis is a research method based on decomposing a phenomenon into its component parts. Using domain-specific methods each component is examined, the relations of causality are established, the factors that generate them, conclusions are drawn and sketches of the future work are drawn, too. [2]

Economic and financial analysis is a set of technical concepts and tools to ensure processing of financial information for the formulation of relevant assessments on the

situation of a company, its performance level, the degree of risk in terms of a dynamic competitive environment.

Scores method is to provide predictive models for assessing a company's bankruptcy risk. This method is based on statistical techniques of discriminated analysis.

Scores is a method of investigating how the overall status of a company's creditworthiness in order to provide some predictive models for risk assessment of a company's bankruptcy. Scores method is an external diagnostic method, which aims to measure the risk to which they expose investors, creditors and the company itself in future work. Its implementation requires observing a group of companies consisting of two distinct groups: a group of companies with financial difficulties and a group of companies without financial problems.

To obtain a full assessment of the viability of the company, a model discrimination analysis is carried out. The principle of this analysis is as follows: knowing the financial characteristics described with the help of rates for a range of companies, including healthy companies and weak companies, the discriminatory analysis determines the best linear combination of rates, differentiating between the better companies from the weaker ones.

The results obtained allow, on one hand, the description of the characteristics of weak companies and, on the other hand, to provide the risk of bankruptcy. After the application of discriminatory analysis, we obtain a Z score, according to all rates. Distribution of scores allows us to say which companies are weak.

3. Methods for Determining the Risk of Bankruptcy

3.1. Liquidity and Solvency Analysis

Liquidity and solvency analysis reflects a company's financial health. There are different opinions on the link between liquidity and solvency. Thus, some experts argue that *liquidity* concerns short-term financial stability and *the solvency* characterizes long-term financial stability; others consider that the terms are interchangeable.

3.1.1. Liquidity Ratio

Liquidity is defined by the degree to which an asset can be converted quickly and without additional costs in the immediate means of payment - cash.

Liquidity indicators are those indicators that determine its given financial condition, characterized by the fact that the short-term current assets allow expenses payable on short term (paying suppliers, credit repayment, taxes, representing the company's current liabilities). In this category there are: *general liquidity ratio*, *partial liquidity ratio* and *immediate liquidity ratio*.

General liquidity ratio (RLG) - is the degree of coverage of total debt by the current assets or compares potential liquidity of current assets with short-term debt (maturity less than one year).

$$RLG = \frac{\text{(Current Assets)}}{\text{(Current Liabilities)}}$$

- a level of general liquidity ratio (RG) >1, implies that companies can pay their debt;
- a level of general liquidity ratio (RG) < 1, indicating coverage of short-term debt outstanding by current assets.

Information is used by short-term lenders to assess the risk of lending to that company. In literature there are various items which recommend that general

liquidity ratio should be between 1.5 and 2. Due to the influences of various factors: type of activity of the analyzed company, the nature of the current assets, current liabilities chargeability, the changing nature of the required working capital, this indicator can vary. For example, *companies that have the field retail activity* have a lower rate of overall liquidity due to the rapid movement of stock and cash payments by customers. *Industrial companies* have relatively high rates of overall liquidity due to high levels of stocks of finished goods, raw materials and unfinished production. As a result, there can be an ideal value for this ratio. In general liquidity analysis, current asset structure is relevant. For example, two companies can have equal rates of overall liquidity, although, in the first case, the current assets consist of stocks, while in the second case, debtors have the greatest weight in current assets. Therefore, it is necessary to use *the partial liquidity ratio*. **Partial liquidity ratio (RLP)** - (the acid test) - expresses the way in which the company's total debts can be covered in the shortest possible time, the calculation excluding the existing stocks

$$RLP = \frac{\text{(Current Assets - Inventory)}}{\text{(Current Liabilities)}}$$

and expresses the company's ability to meet short-term debt from cash and receivables.

Limited liquidity ratio (the acid test) associates the most liquid current assets, excluding stocks that may require a period of 3-4 months to make money, with current liabilities. Economic analysts consider that the level of **RLP** < 1 is favourable. In industry, a decrease of partial liquidity ratio reflects better the company's ability to honour obligations than a general deceleration in liquidity.

Immediate liquidity ratios (cash ratio) - RL_i; General ratios and partial liquidity
General liquidity ratios and partial

liquidity ratios involve the transformation of current assets into cash. In reality, companies do not sell current assets to pay current debts because they would close if they did it. Thus, it is recommended the analysis of the level and the evolution of the liquidity ratios in combination with the rotation ratios, and, secondly, the calculation of immediate liquidity.

Immediate liquidity ratio [3] - expresses the ability to instantaneous repay current debts, taking into account the existing income.

$RL_i = \text{Cash} / \text{Current Liabilities}$

Economic theory maintains as adequate a liquidity ratio RL_i between **0.2** and **0.3**. A large amount of that rate reflects a higher liquidity, but may represent an inefficient use of available funds and can not guarantee the company's solvency if there are other current assets with low liquidity.

3.1.2. Solvency ratios

Solvency is the company's ability to meet maturing obligations resulting either from previous commitments, or from current operation whose realization are a condition to the continuation of the activity, or from compulsory levies.

To determine and analyze solvency, the immediate availability of money and the perspective equity are compared with the company's obligations for the same period. The most important indicators of solvency in terms of bankruptcy risk analysis are the *general solvency ratio* and the *patrimony solvency ratio*.

General solvency ratio (RS_g) - reflects a company's ability to meet all its maturity on the short, medium and long term. It is determined as a ratio between total assets and total liabilities.

$RS_g = (\text{Total Assets} / \text{Total Liabilities})$

This indicator reflects:

- the coverage of liabilities by assets;

- company's possibility to convert assets into cash to honour the payment obligations.

Patrimony liquidity rate (RLp) - the degree of coverage of the borrowed capital by the equity.

$RLp = (\text{equity}) / (\text{equity} + \text{medium and long term loans})$

The optimal value of this indicator is between 0.4 and 0.6. A value below 0.3 indicates a critical juncture for the company, and values higher than 0.5 indicates a favourable situation for the company.

3.2. Analysis of Financial Balance

The company's financial balance - assumes a correlation between the capital needs and the possibility of obtaining them.

According to the patrimony theory [5], an entity is solvent if there is equality within the financial balance:

Fixed assets = permanent capital

Net current assets = exploitation expenses

The compliance with these financial equalities requires a perfect regularity of payments. So it assumes that the average processing time of the assets in cash is close to the average short-term debt repayment, which in economic and financial practice usually does not happen. As a result, the necessity of constituting a reserve called the „working capital (FRF)“ appears.

The working capital is considered a company's safety net, required by the existing gap between the liquidity of assets and the liabilities. Over time this indicator has been the subject of much discussion, knowing various forms. The most accepted is the patrimony working capital (permanent net) and the net overall one. The oldest form of a working capital is the gross working capital (totally, economic),

designating all the current assets, convertible into cash and renewable.

The balance sheet has two parts: top (*needs, permanent capital*) and bottom (*needs or current assets, temporary resources or short-term liabilities*).

a) Using the top of the balance sheet
(FRF) = Permanent Capital – Fixed Assets

The working capital is surplus of permanent capital on fixed assets, used for financing current assets.

Financial working capital = Own working capital + lent working capital
 where:

Own working capital = equity - fixed assets

Lent working capital = medium and long term debts

The own working capital is the excess of equity on fixed assets, allowing the appreciation of the degree of the company's financial autonomy to finance fixed assets.

- If *permanent capital* > *fixed assets (permanent needs)*, results a positive working capital (FRP) that characterizes a long-term financial balance;
- If *permanent capital* < *fixed assets (permanent needs)*, the financial working capital (FRP) reflects a situation of financial imbalance; absorbing some of the temporary resources to fund ongoing needs contrary to the financing principle that says that permanent needs must be financed from permanent resources.

b) Using the lower part of the balance sheet:

(FRF) = Net Current Assets - Short-term debt (1)

- If, *Net current assets* > *Short-term debts*, a positive FRF results. In this case current assets convertible into cash allow short-term debt repayment, resulting an excess of liquidity, which will ensure the company's solvency.
- If, *Net current assets* < *Short-term debts*, a negative FRF results, reflecting

an imbalance characterized by the absorption of part of temporary resources to fund ongoing needs.

For a real appreciation of the company's situation through the revolving fund other indicators must be used: required working capital (NFR) and net Treasury (TN).

Required working capital (NFR) = Net current assets - short-term debts

The required working capital represents the size of financial resources of the current assets necessary for carrying out the company's activity.

- *Positive NFR*, shows a surplus of financing needs in relation to short-term debts. This is considered normal only if it is the result of an aggressive investment policy to increase the needed working capital;
- *Negative NFR*, shows a surplus of liabilities in relation to capital needs, a situation which can be considered positive if it is the result of an acceleration of the rotation of current assets and having debts with more distant maturity.

Net Treasury (TN) = Working Capital Fund (FR) - Need for working capital (NFR)

In economic practice it is desirable that the working capital is greater than half the need for the working capital. *In a situation of financial equilibrium*, the working capital covers the need for the working capital and have a positive treasury, namely to balance the bottom of the balance sheet, i.e.: **FRF = NFR + TN**

This is considered the financial balance equation.

From the financial balance equation emerges the idea that the main component of financial stability is *the need for working capital (NFR)*, an indicator whose size is directly dependent on turnover and may be provided by the financial policy of the company's management.

4. Assessment of Bankruptcy Risk with the Score Method

As companies' economic activity has faced more and more uncertain situations, the diagnosis of bankruptcy risk has grown by using multidimensional statistical methods that allow analyzing a company's financial situation from a combination of rates. One of these methods is the score method (Discriminant analysis).

Z score is a linear function of several variables characterized by average coefficients, determined by the method of the smallest squares. The score indicates a class of risk, of deficiency or failure in which a company stands. The general form of the Z score function is:

$$Z = K_1 X_1 + K_2 X_2 + \dots + K_n X_n$$

Where:

K_i = the weight coefficient of each rate,
 R_i = rates of return and of capital structure.

In the economic theory and practice there were developed several models based on the score method, of which the most used are: the *Altman model* and the *Conor - Holder model*.

4.1. The Altman Model

The Altman Function [1] was established by Professor Altman on a sample of 66 companies, of which 33 with financial difficulties, using, initially, 22 indicators, of which he selected only 5. The resulted model based on financial indices and multiple discriminant analysis is of the form:

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

where:

Z - value of the company's discriminant function;

X_1 - the ratio between the net working capital and total assets,

X_2 - the ratio between the company's retained profits and total assets

X_3 - the ratio between the operating profit and total assets,

X_4 - the ratio between the market value of equity and total debt,

X_5 - the ratio between the turnover and total assets.

As a result, the Z score is interpreted as follows:

Table 1

Nr.	Size of Z function	Company's Situation
1	$Z < 1,8$	- imminent bankruptcy
2	$1,8 < Z < 3$	- financial situation is difficult, with performance close to the threshold of bankruptcy
3	$Z > 3$	- financial situation is good; solvency

The model can predict bankruptcy with an accuracy of 95% a year before its occurrence and with a probability of 72% with two years before bankruptcy.

4.2. The Conann and Holder Model

This model is based on the analysis of liquidity-chargeability and applies to industrial companies with a total of 10 to 500 employees. The score is based on a function with five variables.

$$Z = 0,24 \times X_1 + 0,22 \times X_2 + 1,16 \times X_3 + 0,87 \times X_4 - 0,10 \times X_5$$

The five economic and financial indicators considered in score calculation:

X_1 = (Gross operating excedent / total debt)

X_2 = (ongoing capital / total assets)

X_3 = (current assets (excluding stocks) / (total assets))

X_4 = (financial expenses / turnover)

X_5 = (personnel costs / value added)

The following table highlights the company's position on the amount of score.

Table 2

Value of Z score		The risk of bankruptcy
$Z > 0,16$	Very good	Less than 10%
$0,1 < Z < 0,16$	Good	From 10% to 30%
$0,04 < Z < 0,1$	Alert	From 30% to 65%
$0,05 < Z < 0,04$	Hazard	From 65% to 90%
$Z > 0,05$	Failure	More than 90%

It is noted that as the value of Z is less, the company's situation is more difficult.

of the PRODUCT SA company listed in Tables: 3, 4 [4] and the following form of the Altman function was used:

5. Results of the Altman Model in Detecting the Risk of Bankruptcy

$$Z = 3,3 \times X_1 + 1,4 \times X_2 + 1,12 \times X_3 + 0,9 X_4 + 0,6 \times X_5$$

For example, it was considered the balance sheet and profit and loss account

Table 3 (euro)

ASSETS	Exercise N	Liabilities	Exercise N+1
Fixed assets	15313205	Social capital	2.270.000
Net current assets	14911748	Reserves	6.021
Accruals	343671	Re-valuation differences	1.517.965
		Other reserve	2.953.069
		Liability	2.093.182
		Accruals	3.628.387

Table 4 (euro)

Turnover	85.746.757
Income from stored production	-4.474.344
Income from immobilized production	612.621
Other operating income	2.117.140
TOTAL OPERATING INCOME	84.002.174
TOTAL OPERATING EXPENSES	81.801.431
A) THE GROSS RESULT OF EXPLOITATION	2.200.743
Financial income	1.550.354
Financial expenses	7.094.860
B) FINANCIAL RESULT	-5.544.512
Exceptional income	4.002.089
Exceptional expenses	537.904
C) EXCEPTIONAL RESULT	3.464.185
TAX	11.467
D) NET RESULT	108.949

$$X_1 = \frac{\text{Gross result of exploitation}}{\text{Total assets}} = \frac{2.200.743}{30.568.624} = 0,07$$

$$X_2 = \frac{\text{Reserves}}{\text{Total assets}} = \frac{6.021}{30.568.624} = 0,0001$$

$$X_3 = \frac{\text{Overall net working capital}}{\text{Total assets}} = \frac{8.566.150}{30.568.624} = 0,280$$

$$X_4 = \frac{\text{turnover}}{\text{Total assets}} = \frac{85.746.757}{30.568.624} = 2,805$$

$$X_5 = \frac{\text{equity}}{\text{Total liability}} = \frac{6.747.055}{20.193.182} = 0,33$$

Replacing these rates in the score function ratio for the Altman model, $Z = 8,063$ is obtained. For this version of Altman function $4 < Z < 8.5$, the company is solvent.

6. Conclusions

To know a company's economic and financial situation and the bankruptcy risk assessment are necessary and very important for the company's managers, who will know the company's possible deficiencies, can predict bankruptcy and will set the strategy and tactics to be followed to avoid this situations.

Measuring the risk of bankruptcy is the most important stage the financial analyst must take into account when making future estimations.

Classical methods of investigating the risk of bankruptcy (static analysis based on patrimonial balance, dynamic analysis) make evident the company's past performance and do not really inform on the company's future and do not offer a comprehensive evaluation of bankruptcy risk.

By using the score method in predicting the bankruptcy risk, an enrichment of the traditional rate analysis is performed, the analysts bringing a special contribution to the effective activity of that company.

But, the automatic application of these models to Romanian companies does not always lead to accurate conclusions regarding the risk of bankruptcy, due to the specific conditions of our country.

Therefore, we recommend using the score method in parallel with classical risk diagnostic methods.

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