BANKRUPTCY RISK ANALYSIS THROUGH FINANCIAL MANAGEMENT

Prof. ELENA HLACIUC, PhD
TA MARIAN SOCOLIUC
Prof. DOREL MATES, PhD

"Ştefan cel Mare” University, Suceava
West University of Timişoara

Abstract

The risk of bankruptcy is closely linked to the state of solvency, reflecting the possibility that an enterprise may not to be able to meet its payment obligations. In this case we can say that the company is in a state of financial difficulty. The status of difficulty of an enterprise is closely related to solvency, this concept reflecting its ability to meet their payment obligations to the business partners. The authors also suggested in this article that on the base of the balance indicators used to analyze the risk to use floating capital, the need for floating capital and net treasury, finally showing where a company is solvent or not.

Keywords

Bankruptcy risk, discriminatory analysis and bankruptcy prediction, score functions

1. Introduction

The analysis of the causes that have determined the bankruptcy of certain enterprises has revealed their diversity and has, at the same time, fuelled the idea that bankruptcy is not a sudden phenomenon caused by conjuncture, but is determined by the progressive degradation of the financial situation and of the health of the enterprise [10]. Bankruptcy risk is related to the difficult state of the enterprise, considered as a permanent financial crisis situation. From a juridical viewpoint, an enterprise is in difficulty when it is in an arrested payment situation, no longer being able to meet the due debts and, in this case, the law stipulates the reorganisation or dissolution of the enterprise [1].

Bankruptcy risk is caused by internal and external causes that will be further explained in this paper.

2. Causes of bankruptcy risk

The analysis of bankruptcy cases tends to emphasize the role of two large categories of generating factors such as factors related to the weakness and internal errors and economic environment factors, both categories having a convergent effect in the degradation process.

The symptoms of an enterprise in difficulty, as identified by the European Union of Chartered Accountants can be detailed in the following chart:
Bankruptcy risk is determined by several causes:

a) External causes: loss or bankruptcy of an important client; bankruptcy of a key supplier; bankruptcy of the bank where the enterprise has its main account; aggressive policy of the competition that leads to the removal of the enterprise from the market; failure to keep up with the technological change, leading to less competitive products and market removal [3];

b) Internal causes: inappropriate management in the investment policy, leading to production capacities whose product undergoes several updates as a result of a change in consumer preferences; operating low productivity machinery and equipment that overcharges the production quality management; repeated losses in the operating activity; Inappropriate indebtedness policy during unstable economic periods;

The study of bankruptcy causes has lead to the conclusion that it is not a brutal phenomenon due to conjectural fluctuations but a result of a progressive degradation of the financial situation of the enterprise as insolvency risk can be predicted a few years before stopping payments [6].

The time degradation of the results of the enterprise, the difficulties it faces (not only of a financial nature), have provided financial analysis with a considerable field of investigation with the purpose of discovering early detection and prediction methods for bankruptcy risk following the difficulties [2].

The importance of bankruptcy prediction and understanding the causes is of a practical and pragmatic nature. The direct costs of bankruptcy (legal taxes, tax payer and lawyer fees, etc) are low as compared to the decrease in value of the
enterprise (losses for shareholders and creditors) [8].

The complex nature of the aspects implied by the bankruptcy risk concept also accounts for the various diagnosis and analysis models of which we mention: the liquidity-exigibility analysis, the functional analysis, the rate analysis, the financial flow analysis, etc., therefore, bankruptcy risk analysis can be developed in a static manner, using the analysis of the balance sheet financial balances, or in a dynamic manner, using the analysis of the flows depicted in the financing chart [5].

The patrimony static analysis of the bankruptcy risk is concerned with the net patrimony of the shareholders and the economic asset as a whole, as a guarantee for creditors, while the operating instruments used here are the financial working capital, liquidity rates and solvency rates [4].

Working capital (WR) is an important index in estimating the financial situation of the enterprise, representing that part of the permanent financial resources that ensure the funding of the circulating assets permanently renew Publishing House.

The solvency of an enterprise, according to the patrimony theory, is granted by the balance of the balance sheet masses of the same length, provided two financial rules are observed:

\[ \text{Ai} \leq \text{Cp}; \quad \text{Ac} \geq \text{Dex} \]

where:
- \( \text{Ai} \) is the immobilised asset;
- \( \text{Cp} \) – permanent capital;
- \( \text{Ac} \) – circulating asset;
- \( \text{Dex} \) – operating debts.

Patrimony solvency – the extent to which equity capital covers the long term duties and the credits by patrimony elements – must be of over 0,3 and an ascending evolution while a value of under 0,3 is a signal of alert for the funding bank as the enterprise might be quasi-bankrupt.

The functional static analysis of bankruptcy risk uses as operating instruments the need of working capital for operations and net treasury, as the insolvency state is reflected by the way in which short-term credits are arranged according to this concept, the balance sheet is the sum of fund allocations and their sources classified in different financial cycles (investment, funding, operating), in order to understand the activity of the enterprise [7].

The need of working capital (NFR) and the net treasury (TN) is determined by means of the following equations:

\[ \text{NFR} = (S + C) - \text{Dex} \]
\[ \text{TN} = \text{FR} - \text{NFR} \]

The circulating assets are given by \( S \), representing stocks, and \( C \), representing claims.

Let us consider the following example of a retail trading company, whose simplified balance sheet is presented in Table no 1:

<table>
<thead>
<tr>
<th>Asset Elements</th>
<th>Lei Value</th>
<th>Liability Elements</th>
<th>Lei Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed assets(Af)</td>
<td>20,000</td>
<td>Permanent capitals(Cp)</td>
<td>15,000</td>
</tr>
<tr>
<td>Circulating assets( Ac)</td>
<td>35,000</td>
<td>Short-term debts (Dts)</td>
<td>40,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>55,000</strong></td>
<td><strong>Total</strong></td>
<td><strong>55,000</strong></td>
</tr>
</tbody>
</table>

The following situations are established:

The medium rotation interval of the stocks is of 2 months; The medium due-date interval for the short-term debts is of 3 months; The company sells and cashes in stocks valued at 35,000 lei, paying 2/3 of the short-term debts.

The working capital calculated when settling the balance sheet is:

\[ \text{FR} = \text{Cp} - \text{Af} = 15.000 - 20.000 = -5.000 \text{ lei} \]
The negative working capital (–5,000 lei) leads to a financial imbalance. The calculation of the need for working capital leads to the following result:

\[ NFR = Ac - Dts = 35,000 - 40,000 = -5,000 \text{ lei.} \]

The need for negative working capital demonstrates a release of circulating sources for funding the permanent needs.

To be noted is that the financial balance is favourable for a short term. In two months from settling the balance sheet, the company will have sold and collected stocks valued at 35,000 lei, paying 2/3 of its short-term debts, i.e. \( 40,000 \times \frac{2}{3} = 26,666 \). Therefore, liquid assets of 13,334 lei will be issued, thus changing (for the better) the situation in the balance settlement.

This example in numbers is proof of the need to take into account the working capital of the rotation of enterprise capital.

The dynamic analysis of bankruptcy risk, developed in the funding chart, starts from the financing flows determined both by the operating activity and by the capital operations (investment and financing) and explains the financial imbalance outlined by the static analysis.

### 3. Models of estimating bankruptcy risk

The calculation of the score function requires the prior awareness of certain rates that help determine the bankruptcy risk of an enterprise and the early protection by correcting measures.

A note (Z), called score, is given for the enterprise, representing a linear combination of rates and, varying with the value of the score, enterprises are classified as vulnerable, bankrupt and healthy.

Most score functions used to determine the probable bankruptcy state of the enterprise, have used as statistical technique the discriminatory analysis, the latter being highly recommended, especially when we want to extract from the multitude of calculated financial indices, the ones that most clearly explain the bankruptcy risk of an enterprise.

Based on specialty literature, this paper will outline the national and international contributions in the field of discriminatory analysis and bankruptcy prediction, also known as the so-called score functions.

The procedure used is the statistic technique of discriminatory analysis of the financial features (calculated using rates) of the normal functioning enterprises and of those experiencing difficulties in their economic and financial management [10].

The first research on bankruptcy risk analysis has been developed in the USA in the '30. The method was called “credit-men” and it aimed at making assessments on the financial situation of an enterprise by means of a synthetic note, thus establishing the position of an enterprise as compared to that of a typical enterprise in the same industry.

The purpose of this model was to study risk in credit granting, including an extension of risk analysis by including certain variables linked to the human factor and the global economic environment.

The subsequent prediction models are based on the discriminatory analysis which was used for studying the evolution of several enterprises in the field, divided into two categories: with a good and with a difficult financial situation, on a long period and using different rates.

The rates considered as significant have been attached to ratios that reflected their influence on the financial situation of the enterprise and, by combining them, came out the score, the Z function, as a liner function of several variables, thus:

\[ Z = a_1 x R_1 + a_2 x R_2 + \ldots + R_n + b \]

where:
- \( a_1, a_2, \ldots, a_n \) – medium weighing ratios (positive or negative in order to assess the favourable or unfavourable impact on the financial situation);
- \( R_1, R_2, \ldots, R_n \) – rates (or financial structure, dynamism, management profitableness), taken into account;
- \( b \) – constant (just in case).
The score thus established divides the enterprises in the two categories (healthy and vulnerable), sometimes even into intermediate categories.

The Conan and Holder model (France, 1979) introduced by the continental school shows the models specific to the sectors of activity have been developed, thus 5 rates have been retained and the function had the following form:

\[ Z = 0.24 \times R_1 + 0.22 \times R_2 + 0.16 \times R_3 - 0.87 \times R_4 - 0.10 \times R_5 \]

- \( R_1 \) = EBE/Total debts; \( R_2 \) = Permanent capital/Total asset; \( R_3 \) = Circulating assets (stocks)/Total asset; \( R_4 \) = Financial expenses/(credit cost)/Turnover(CA); \( R_5 \) = Personal expenses/Value added (VA)

The enterprise is considered at risk, varying with the score value, as follows (Table no. 2):

<table>
<thead>
<tr>
<th>Score value</th>
<th>Situation of the enterprise</th>
<th>Bankruptcy risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Z &gt; 0.16 )</td>
<td>Very good</td>
<td>Lower than 10%</td>
</tr>
<tr>
<td>( 0.10 &lt; Z &lt; 0.16 )</td>
<td>Good</td>
<td>From 10% - 30%</td>
</tr>
<tr>
<td>( 0.04 &lt; Z &lt; 0.10 )</td>
<td>Alert</td>
<td>From 30% – 65%</td>
</tr>
<tr>
<td>( -0.15 &lt; Z &lt; 0.04 )</td>
<td>Danger</td>
<td>From 65% – 90%</td>
</tr>
<tr>
<td>( Z &lt; -0.05 )</td>
<td>Failure</td>
<td>Higher than 90%</td>
</tr>
</tbody>
</table>

The contribution of this function can be found in the decision making rule as the probability of error in classifying an enterprise is higher if the value taken into consideration in the calculation of the function for this enterprise is closer to the decision threshold.

The Conan-Holder model usually generates important results in predicting the short-term evolution of trading companies. Such a model is accurate only where the bankruptcy rule operates, when the hidden subsidies are cancelled, commercial credit is well managed and where statistics are adequate.

4. Summary

Based on specialty literature, this paper will outline the national and international contributions in the field of discriminatory analysis and bankruptcy prediction, also known as the so-called score functions.

The procedure used is the statistic technique of discriminatory analysis of the financial features (calculated using rates) of the normal functioning enterprises and of those experiencing difficulties in their economic and financial management.

Thus, this paper introduces the main scoring methods for estimating bankruptcy risk, also underlining the main analysis schools, the Anglo-Saxon and the continental school respectively, and also outlining the national development in the field, the contributions of the Romanian school of economic-financial analysis.

References


