ANALYSIS METHODS OF BANKRUPTCY RISK IN ROMANIAN ENERGY MINING INDUSTRY

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Abstract
The study is an analysis of bankruptcy risk and assessing the economic performance of the entity in charge of energy mining industry from southwest region. The scientific activity assesses the risk of bankruptcy using score's method and some indicators witch reflecting the results obtained and elements from organization balance sheet involved in mining and energy which contributes to the stability of the national energy system. Analysis undertaken is focused on the application of the business organization models that allow a comprehensive assessment of the risk of bankruptcy and be an instrument of its forecast. In this study will be highlighted developments bankruptcy risk within the organization through the Altman model and Conan-Holder model in order to show a versatile image on the organization's ability to ensure business continuity.

Key words: risk of bankruptcy, organization, business recovery.

JEL codes: M41, Q30, Q40.

1. Introduction

Bankruptcy risk analysis based on the indicators is assessed on the creditworthiness of the organization. But they provide information on past performance of the company, which may degrade over time and does not provide an overall assessment of the risk of bankruptcy. Therefore international financial practice recommended in addition to methods for predicting bankruptcy risk (scores method), the summation of certain rates weighted by a factor of importance to them. Method scoring is based on discriminant analysis techniques and serve as an additional traditional analysis.

Discriminant analysis is based on the probability of belonging to a class of people based on known elements. Thus, analysis of bankruptcy, the organization will be classified in one category depending on the value of a discriminant indicator designed as a linear combination of N rates weighted by a factor of importance in the rate.

The risk is a multi-dimensional concept, which can not be reduced to a single element or an indicator expressed by a number. For the organization it is necessary to determine an acceptable level of risk he is willing to and take. It differs depending on the concrete conditions of doing business and the entrepreneur attitude towards risk.

In the context of globalization of commercial transactions and increasing the quality level of goods required in the global market, it becomes imperative that each undertaking to mobilize all available resources for management optimal bankruptcy risk so as to ensure sustainable development of the activity developed according to the estimated level of profitability.

The organization's work is constantly subjected to the action of key risk factors affecting the company's performance and its ability to conduct a safe strategic objectives set out in its business strategy.

The objective in developing this study is the analysis of bankruptcy risk within the organization with activities in mining industry energy using Altman model and model Conan-Holder in the current circumstances where the requirements of competitiveness coming from Europe determined makers indigenous to adopt measures that need appropriate for the current situation in mining while optimizing operating costs throughout the system.

In the study we conducted on the assumption that the organization can take timely measures to redress damage to work performed when property items found as a result of the application of the abovementioned models diagnostic analysis of bankruptcy risk.

Following this scientific approach by analyzing the activity of the organization I intend to get results that can be used by decision makers in mining, energy development and implementation of the measures required to improve the financial situation of the organization with clear prospects and solid future. Also, ratio analysis involved in

determining bankruptcy risk of the economic entity will help determine the actual capacity of the organization to manage the risks inherent in its engagement to ensure all available resources to achieve the financial soundness of the proposed.

2. Literature review

The literature definition of risk has been a challenge for most theorists regarded due to major changes in the economy at micro and macro. Thus, the concept of risk has become valences multidisciplinary depending on the experience of initiating and deliverables in research.

Some authors (T. Dănescu and Mărginean R) states that risk and uncertainty are two elements palpable economic phenomenon more acutely felt than in times of economic and financial crisis. With the bankruptcy of US companies and generalized economic crisis in the world economy, there was a constant concern of specialists for two key elements: Issuing an opinion related to the going concern assessment and decision making related to the quantification of the risk of bankruptcy. [1]

In his view Barthelemy B., risk is a situation or set of simultaneous or consecutive events whose occurrence is uncertain. [2]

In a general sense, risk is a measure of uncertainty that it entails an investment. Risk analysis therefore aim uncertainty of future flows at the enterprise level or individual sources of capital (debt, preferred shares, common shares, etc.). [3]

In a narrower sense is the risk that an action to generate future losses affecting assets, interests, and results of a trader. [4]

Kast R., and A. Lapied, considers that an enterprise ensures continuity in the economic state through optimal management of the risks they face. "To manage the risk of quality is an evolution toward permanence." [5]

Other authors (D. Watson and A. Head) highlighted the link between return and risk as two fundamental concepts that depend on financial decisions taken by the management of any company. They are in a relationship of proportionality. If the expected return will be higher and the risk will increase in the same direction. [6]

In another vision, Panayotis Alexakis, said that Altman model timeliness researching the companies on the stock market in Greece confirms his ownership to predict an economic collapse before 5 years or even eight years. Thus managers have at their disposal an effective tool to anticipate economic and financial developments of the company. [7]

3. Research methodology

The quantitative research undertaken in this study is combined effectively with qualitative research for granting a study undertaken considerable values. Thus, the theoretical research work was developed in conjunction with applied research (practice) within the organization analyzed.

Qualitative research allows deductive approach, based on concepts, theoretical concepts and specific regulations of the study area and continuing with practical applications based on accounting data recorded in the company. Research methods commonly used in the paper are different, among which are highlighted: the observation group and comparison.

The scientific approach of this work was conducted by consulting various existing bibliographic sources, data collection and synthesis by the information gathered, respectively evaluating the results synthesized to carry out a critical analysis on the current state of knowledge on the issues studied.

4. Analysis of bankruptcy risk using Altman model

Altman model was developed in the US in 1968 by professor Altman. Information that led to the development of this model were gathered by studying a sample meant for companies both from those who have gone bankrupt and among those who survived from the manufacturing sector. The author emphasizes that the analysis model based on multiple variables with 5 indicators allow anticipation of 75% of bankruptcies two years prior to their production. This model include profitability as the key asset, weighted with a value close to the other four indicators together. Altman model consists of five installments based on weighted as follows:

$$\mathbf{Z = 1{,}2R_1 + 1{,}4R_2 + 3{,}3R_3 + 0{,}6R_4 + R_5}$$

where,

$R_1 = \frac{\text{Current asset}}{\text{Total asset}}$, is ratio of current assets;

$R_2 = \frac{\text{Reinvested earnings}}{Total\ asset}$, investment rate of return;

$R_3 = \frac{Gross\ Profit}{Total\ asset}$, economic rate of return;

$R_4 = \frac{\text{Market capitalization}}{\text{total liabilities}}$, rate of financial security;

$R_5 = \frac{\text{Fiscal value}}{Total\ asset}$, the rotational speed of total assets.

Depending on the outcome function Z, Altman model ranks companies as follows: [8]

- If Z > 2,675, then the firm is solvent;
- If 1.81 < Z < 2,675, then state of the company is difficult but it can improve the situation to the extent that will manage the efficient work;
- If Z < 1,8, then the company is insolvent and bankruptcy is imminent.

The application of Altman model in the the company analyzed is presented in Table no. 1.

Table no 1. Determination of the function Z by model Altman (RON)

Indicator	Period			
	2012	2013	2014	2015
Total asset	8.340.772	8.596.622	8.361.942	7.664.931
Current assets	1.433.827	1.579.005	1.200.248	704.042
Reinvested earnings	0	0	0	0
Personal capital	5.482.474	5.398.019	4.706.398	3.908.338
Fiscal value	2.236.654	2.648.585	2.565.625	2.699.751
Total debts	2.418.746	2.560.193	2.889.749	2.748.710
Gross profit	176.111	72.980	0	0
The rate of current assets (R_1)	0,2	0,2	0,1	0,1
Reinvested profit rate (R_2)	0	0	0	0
Economic rate of return (R_3)	0,02	0,01	0	0
Rate financial security (R_4)	2,3	2,1	1,6	1,4
The rotation speed of the asset	0,3	0,3	0,3	0,3
Function **Z**	**1,92**	**1,83**	**1,38**	**1,26**

Source: Own processing based on the analysis of financial statements of the company

The Z Function through Altman model presents the following chart:

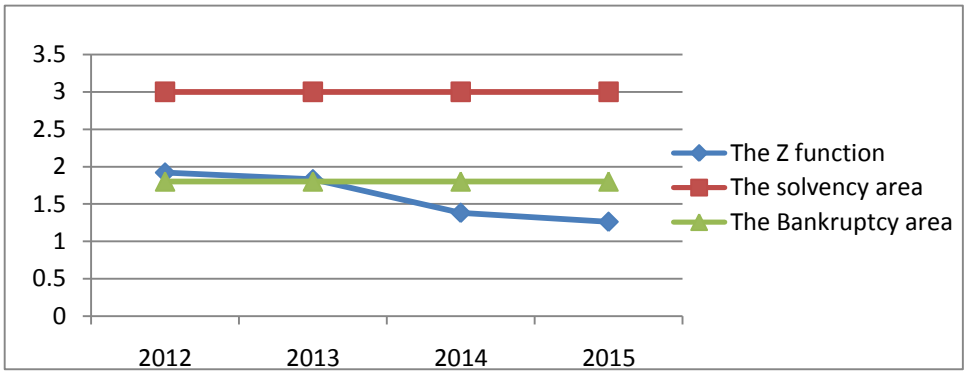

Figure no 1. Function Z through Altman model
Source: Own processing

After analyzing bankruptcy risk by Altman model (Table no 1) shows that the company analyzed the 2012-2013 fall in the range between 1.81 and 2.65 in February on the outcome function Z which shows that the company

recorded in the reference period but a difficult financial situation which is getting worse since 2014 when it recorded a total loss of RON 693 635 725 respectively recorded in 2015 when the loss amounts to Ron 960 856 433.

In order to improve the company's financial situation required the development of a recovery plan activity by reducing operational costs and recuperarera existing crenţelor to adjust their business provisioning and renegotiating reasons of profitability of commercial contracts concluded with third parties.

5. Analysis of bankruptcy risk using Conan-Holder model

The Conan - Holder was conducted by Joel Michel Conan and Holder in 1978 with the immediate purpose of analyzing the degradation of small and medium enterprises in France between 1970-1975. [9]. In order to substantiate this analysis was taken a sample of 198 companies (most on the verge of bankruptcy) that tested a set of 31 installments receiving studied distribution and correlation. When the survey was proposed a discriminant function Z as:

$$Z = 16\,x1 + 22\,x2 - 87\,x3 - 10x4 + 24\,x5$$

where:

- The variable x_1 is quick liquidity ratio: $x_1 = \frac{\text{Current assets} - \text{stocks}}{\text{Short term debts}}$;
- The variable x_2 means financial stability of the company: $x_2 = \frac{Permanent\ capital}{\text{Total liabilities}}$
- The variable x_3 shows how financing sales of borrowed sources: $x_3 = \frac{\text{financial charges}}{Fiscal\ value}$
- The variable x_4 is the contribution of personnel expenses to create added value: $x_4 = \frac{\text{Staff costs}}{Added\ value}$
- The variable x_5 show gross exploitation surplus share in the added value: $x_5 = \frac{\text{Gross operating surplus}}{\text{Added value}}$

Enterprise's score allows its classification to a certain class of risk. Methodology proposed risk classification in grade of Conan and Holder which highlights the probability of bankruptcy of the entity is given in Table no 2.

Tabelul no 2. Interpretation of scores of the Conan-Holder model

The value of Z score	The probability of bankruptcy
Negative	> 80
0 – 1,5	75 – 80%
1,5 – 4	70 – 75%
4 – 8,5	50 – 70 %
8,5 – 9	35%
9 – 10	30%
10 – 13	25%
13 – 16	15%
Z > 16	less than 15%

Source: Burja C, Financial and economic analysis - Methodological aspects and practical applications, 2009, p 295

After analyzing data from the Balance Sheet and Profit and Loss Account of the Company analyzed, Conan-Holder model is presented in Table no 3.

Table no 3. Application model Conan-Holder in the company concerned RON

Indicator	Period			
	2012	2013	2014	2015
Receivables	874.864	1.022.338	860.547	435.062
Cash availability	223.657	136.255	23.966	55.450
Short term debts	883.903	912.356	1.029.341	1.721.384
Permanent capital	7.456.869	7.684.266	7.332.601	5.943.547
Total liabilities	8.340.772	8.596.622	8.361.942	7.664.931
Financial charges	127.160	183.944	162.843	248.194
Fiscal value	2.236.654	2.648.585	2.565.625	2.699.751
Staff costs	679.237	1.091.682	1.078.115	951.525
Added value	895.967	1.109.844	940.186	1.002.459
Gross operating surplus	188.385	-81.434	-260.227	-55.158
x_1	1,24	1,26	0,85	0,3
x_2	0,89	0,89	0,87	0,8
x_3	0,05	0,07	0,06	0,1
x_4	0,75	0,98	1,15	0,9
x_5	0,21	-0,07	-0,28	-0,1
Function Z	**32,61**	**22,17**	**9,3**	**2,3**

Own processing based on the analysis of financial statements of the company

The Z Function through Conan-Holder model presents the following chart:

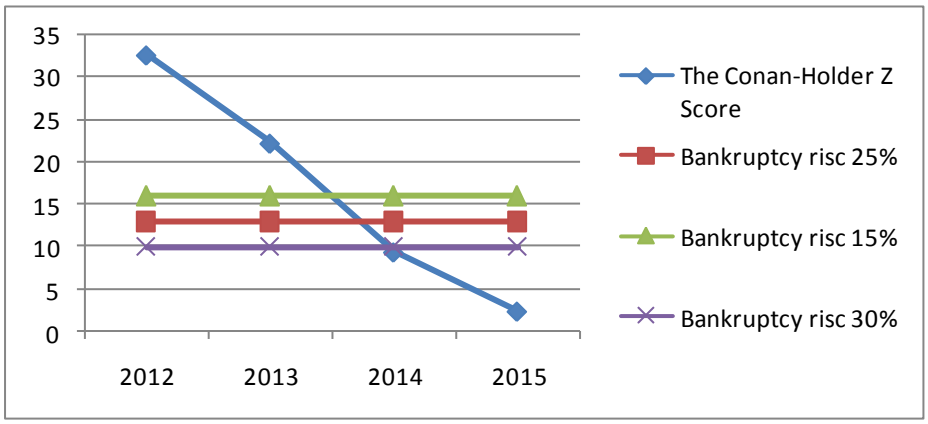

Figure no 2. Function Z through Conan-Holder model
Source: Own processing

Result analysis using the pattern Conan-Holder enrolled in Figure no 2 shows a very good situation for the unit in 2012 after the company's financial situation following a downward trend towards a 70% risk of bankruptcy, according to the methodology of calculation of the model. Unit's score reaches 32.61 in 2012, decreased from 22.17 in 2013 to 9.3 in 2014 and 2.3 in 2015 due to significant deterioration in economic and financial indicators, which means in terms of the probability of bankruptcy a disadvantage for the company. Required urgent action by policy makers to address the organization's activities so that the Z score to be in the range 9-32 which reflects a favorable situation for the company.

6. Conclusion

Diagnosis bankruptcy risk through patterns described above, is crucial for the management of the organization as it can weather the economic entity before bankruptcy to occur with a considerable time and is set makers recovery business opportunity.

Highlighting and interpretation bankruptcy risk is central because this has major implications for shareholders, business partners, potential investors and employees of the company. Between bankruptcy risk and there

is a close relationship in the sense that as an activity involving a higher risk, the likelihood of bankruptcy is higher.

According to the model Altman company recorded in the reference period a difficult financial situation which is getting worse but in 2015 the loss in the previous year increases considerably.

In order to improve the company's financial situation required the development of a recovery plan activity by reducing operational costs and existing debt recovery to adjust their business provisioning and renegotiating reasons of profitability of commercial contracts concluded with third parties.

Application model Conan-Holder highlights a very good situation for the company in 2012 following the results of accounting recorded in subsequent years to place the entity on a trend down to a risk of bankruptcy of 30% according to the methodology model requiring urgent measures to redress the activity.

Altman and Conan-Holder models are two very useful tools because they require management organization, methodology implementation, a considerable amount of information the accounting balance sheet and profit and loss account in order to deepen the analysis of the activity of the undertaking. The ability of these models to highlight the risk of bankruptcy manifestation 3 - 5 years ante factum, plays enable decision-makers to adopt the necessary measures in short time.

7. References

[1] Dănescu T., Mărginean R., „The Evaluation of the Going Principle through the Altman Pattern- Case Study", articol prezentat la conferinţa internaţională Accounting and Audit Convergence 2013 Convention, The Faculty of Economics and Business Administration within Babes-Bolyai University.
[2] Barthelemy B., Gestion de risques – *methode d'optimisation globale,* Ed. D'Organisation, Paris, 2000.
[3] Robu V., Anghel I., Serban E.C., Analiza economico-*financiară a firmei,* Editura Economică, Bucureşti, 2014.
[4] Buglea A., Lala-Popa I., Analiza economico-*financiară,* Editura Mirton, Timişoara, 2009.
[5] Kast R., Lapied A., Analyse Economique et Financiere des Nouveaux Risques, Ed. Economica, Paris, 2004,
[6] Watson D., Head A., Corporate Finance, Principles & Practice, fourth edition, Sheffield Hallam University, 2007.
[7] Panayotis Alexakis, „Altman Z scode model and prediction of business failures", International Journal of Monetary Economics and Finance, vol. 1, nr. 4, 2008.
[8] Petrescu S. *Analiză şi diagnosti*c financiar-contabil. Ghid teoretico-aplicativ, ediţia a II-a, revizuită şi adăugată, Edit. CECCAR, Bucureşti, 2010.
[9] Burja C., *Analiză economico-financiară – Aspecte metodologice şi aplicaţii practice*-, Editura Casa Cărţii de Ştiinţă, Cluj Napoca, 2009.
[10] Watson D., Head A., Corporate Finance, Principles & Practice, fourth edition, Sheffield Hallam University, 2007.
[11] Gibson C., (2009), Financial Reporting & Analysis, Using Financial Accounting Information, 11 th Edition, South – Western, 2009.
[12] Damodaran A., „Return on Capital (ROC), Return on Invested Capital (ROIC) and Return on Equity (ROE): *Measurement and implication"* Stern School of Business, 2007.
[13] Higgins R.C., Analysis for Financial Management, Business One Irwin, 1992.
[14] Siminica, M. şi Stefan, I. O., The Impact Of The Financial Crisis On The Financial Position Of Companies Listed On Bucharest Stock Exchange, Article provided by University of Craiova, Faculty of Economics and Business Administration in its journal Annals of Computational Economics, Volume 3, Issue 40, 2012.