POSSIBILITIES FOR DETERMINING THE BANKRUPTCY OF COMPANIES

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Abstract: *The aim of this article is to identify the causes that led to the bankruptcy of companies through ALTMAN, CANON-HOLDER, CEMATT Models. The main objectives used in drafting article consisted in defining economic-financial diagnosis, presentation of the number of companies which are bankrupt in Romania in the year 2013, the presentation of ALTMAN, CANON-HOLDER, CEMATT. The scientific approach is based on information from the national literature and documentation practices carried out within a company, Alba country, the company listed on the Bucharest Stock Exchange. In the elaboration of the thesis I opted on the combination of quantitative research qualitative research in order to obtain the expected results as a result of the research undertaken, research instruments belonging to the two classes of methods: literature review, comparison, descriptive analysis, case study method, the interpretation of data.*

Keywords: *bankruptcy, diagnostic, ALTMAN Model, CONAN-HOLDER Model, CEMATT Method*

JEL Classification: M00, C01, E00

INTRODUCTION

Between risk and bankruptcy there is a direct relationship of proportionality namely: how a action involves less risk the possibility of bankruptcy is lower and vice versa. Due to the recession, bankruptcies in recent years, grew at an accelerated pace. Studies that predicted damage and termination were primarily focused on examining the economic operators who are bankrupt, trying to distinguish the particular financial characteristics that led to this result (Trenca Ioan, 2006, p. 209).

According to a study by Coface Romania over 100,000 businesses have disappeared from the Romanian economy in 2013, more than those established in the previous two years. The company had business 111.000 total 43.5 billion lei, which means that approximately 10 billion euros went missing from the Romanian economy. Most of these firms were in the old economy of about 10 years, and gave the work a number of 276.700 employees. Coface estimates that up to the end of the year there will be about 25,000 firms entering into insolvency.

Financial analysis through classical methods based on the situation on the evolution of the performance of the assets, financial situation of the Revolving Fund and the amount of revolving fund or financing on the basis of partial information about the risk of bankruptcy and generally an assessment on the situation. That's why it has become necessary to use methods which allow an overall assessment of the risk of bankruptcy and its forecasting tool. Economic theory know multiple models, but analysis of the most commonly used are model Altman, Canon model-Holder and the Central Bank of France (Burja Camelia, 2009, p. 291).

A FEW GENERAL POINTS RELATING TO ECONOMIC-FINANCIAL DIAGNOSTIC

In recent years, the economic-financial diagnosis is debated in the scientific literature in the field. To as a stop on the most important studies and publications of prestigious authors and experts. The term diagnostic is taken from Greek diagnostikos meaning apt to know and borrowed from the practice of medicine is an approach aimed at the recognition of certain diseases after their symptoms in order to discover the causes and therapy healing training ((Petrescu Silvia, 2004, 14-15).

Diagnostic about a component of management system that allows both the prior formation of fixing objectives and with regard to their implementation. Improving the coherence of decisions allows diagnosis of importance for ensuring the viability of the undertaking:

-Consistency between the enterprise and the trends in the competitive environment;
-The coherence between objectives and means,
-The coherence of tactical operations, strategic orientations, political and cultural system of the enterprise (Niculescu Maria, 2003, p.27).

Economic-financial diagnostic involves a complex research aimed at the discovery of disturbances arising in activity of the enterprise and the causes thereof, for the purpose of drawing up decisions enabling the recovery situation and improve performance. In the economic-financial diagnosis a distinctly lo owns financial diagnosis aimed specifically at service accounts of the undertaking, being geared in particular towards profitability and risks (Petrescu Silvia, 2004, p.14-15).

Financial diagnostic based on financial analysis shall proceed in the same manner, having regard to the General objectives: demonstration of the disturbances or bad elements in the entity's financial position and performance; identification of present or future difficulties of the establishment and presentation of the entity's development prospects and the proposed actions to be taken in order to improve or restore the situation (Petrescu Silvia, 2008, p.14-15). Diagnostic of profitability and risk a company occupies the central place in the financial analyses carried out in both financial management and institutions. The diagnostic is preceded by the analysis are the basis of tactical and strategic financial decisions adopted by Enterprise Onofrei Mihaela, 2006, p. 87).

We considered that financial diagnostic is one component of comprehensive diagnosis through a system of indicators may present issues concerning financial equilibrium, position the enterprise enterprise performance, liquidity, at one point and take decisions about the future of the company.

FINANCIAL DIAGNOSTIC ANALYSIS FOR SC A SA IN THE PERIOD 2011-2012

Net current assets, i.e., rulement net, Fund has negative values in the two years analysed what represents a first signal to the insolvency of the SC A SA. Achieving financial diagnosis appreciates the financial status of the company in terms of performance on the basis of the following methods: ALTMAN, the CONAN Model-HOLDER, CEMATT Method. The data used for this example belong to companies of Alba Iulia and are part of the annual financial statements for the period 2011-2012, according to the address: http://www.bvb.ro

A) ALTMAN MODEL

Altman model was created in the USA in 1968, and in 1977 to bring improvements. Is the creation of Professor Altman is known in the literature as "prediction model of bankruptcy".

The model is based on the following function:

$$Z=1,2*x_1+1,4*x_2+3,3*x_3+0,6*x_4+0,999*x_5$$

x_1, x_2, x_3, x_4, x_5 are determined through (Achim Monica Violeta, 2009, p. 412):

1. **Business flexibility (x_1)** determined as the ratio between the working capital (net current assets) (WC) and total assets (TA): $x_1 = \frac{WC}{TA}$

2. **Self financing rate of total assets (x_2)** representing the ratio between the reinvested profit (RP) and total assest (TA): $x_2 = \frac{RP}{TA}$

3. **Economic profitability rate (x_3)** calculated as the ratio between the profit before interest and taxes (EBIT) and total assets (TA): $x_3 = \frac{EBIT}{TA}$

4. **Debt ratio (x_4)** the extent to which debts (TD) are covered by the company's paid-up share capital (PUC): $x_4 = \frac{PUC}{TD}$

5. **Return on assets (x_5)** the ratio between the turnover (T) and total assets (TA): $x_5 = \frac{T}{TA}$

We will continue to present this for of a SC A SA of Alba county in the period 2011-2012.

Table No. 1 Calculation of indicators of Altman Model at SC A SA

Nr. Crt.	Indicator	Rezultate	
		Anul 2011	Anul 2012
1	Business flexibility	0,38	0,37
2	Self financing rate of total assets	0,02	0,03
3	Economic profitability rate	0,04	0,05
4	Debt ratio	0,53	0,64
5	Return on assets	1,55	1,69

Source: own calculations based on the accounts of SC A SA

z_{2011} = 1,2*0,38+1,4*0,02+3,3*0,04+0,6*0,53+0,999*1,55 = 2,48

z_{2012} = 1,2*0,37+1,4*0,03+3,3*0,05+0,6*0,64+0,999*1,69 = 1,2

As a result of the compilation of the Altaman model, which fall within the following limits:

- -If z > 3 → entity is solvent
- -If 3 z = 1.8 > > → entity has financial difficulties
- -If z < 1.8 → imminent bankruptcy

The calculations made, it appears that SC A SA has its financial difficulties in the two-year study.

B) CONAN-HOLDER MODEL

Canon-Holder model was developed by two authors fits in the methods tested statistically.It is applied to industrial undertakings with a number between 10 and 500 employees. It is based on a sample of 95 of the small and medium enterprises, half of which were bankrupt in the period 1970-1975. Businesses surveyed were statistically grouped and it was determined a score function applicable to industrial establishments, construction companies, wholesale trade and the transport (Achim Monica Valentine, 2009, p. 412).

The model is based on the following function:

Z=16*x1+22*x2-87*x3-10*x4+24*x5

x_1, x_2, x_3, x_4, x_5 is determined by the relations:

1. Immediate liquidity rate (x_1) determined as the ratio between current assets minus inventory and current debts: $x_1 = \frac{CA - I}{CD}$

2. Financial stability rate (x_2) is the equity capital in total liabilities: $x_2 = \frac{EC}{TL}$

3. The degree of sales financing from external sources (x_3) represents ratio of financial expenses and net trurnover: $x_3 = \frac{FE}{NT}$

4. The degree of compensation of employees (x_4) calculated as the ratio between staff costs and value added: $x_4 = \frac{PC}{VA}$

5. Profitability rate of value added (x_5) is the share of gross result of the enterprise and value adeed: $x_5 = \frac{GRE}{VA}$

Calculations performed by the Conan-Holder, on the financial statements of the SC A SA shall be presented as follows:

Table No. 2 The calculation of indicators of Conan-Holder from SC A SA

Nr. Crt.	Indicator	Rezultate	
		Anul 2011	Anul 2012
1	Immediate liquidity rate	0,67	0,69
2	Financial stability rate	0,55	0,58
3	The degree of sales financing from external sources	0,02	0,02
4	The degree of compensation of employees	0,48	0,39
5	Profitability rate of value added	0,16	0,14

Source: own calculations based on the financial statements of the SC A SA

z_{2011} = 16*0,67+22*0,55-87*0,02-10*0,48+24*0,16 = 20,12

z_{2012} = 16*0,69+22*0,58-87*0,02-10*0,39+24*0,14 = 21,52

In the case of this model, the risk of bankruptcy depends on the level of Z, as follows:

- If z>9 → > entity is solvent
- If 4 > z > 9 → entity has financial difficulties
- If z<4 → imminent bankruptcy

Table No. 3 the probability of bankruptcy Canon Holder model

Score value	The Probability of bankruptcy
Z < 0	> 80%
0 < Z < 1,5	75% - 80%
1,5 < Z < 4	70% - 75%
4 < Z < 8,5	50% - 70%
Z=9,5	35%
Z=10	30%
Z=13	25%
Z=16	15%
Z>16	<10%

Source: Bătrâncea Maria, Risc și faliment, Dacia Publishing House, Cluj Napoca, 2003, p.118

Because the value of Z in the two years study is greater than 9 (20,12 in 2011 and 2012 21,52), SC A SA is solvabila and the probability of bankruptcy is less than 10%.

C) *CEMATT MODEL*

With a view to making choices regarding restructuring solutions and strategic plans in order to provide an undertaking in the current period of transition to the market

economy model analysis of "CEMATT" is designed as a diagnostic tool the company multicriterial (Hada Teodor, 1997, p. 25). The structure of the model is heuristic, because he refers to a procedure to search an unknown targets, through the use of criteria allowing to obtain a complete picture of the condition of the enterprise.

CEMATT model involves calculation of the 11 indicators as follows:

1. **Economic profitability** calculated as the ratio between the profit obtained from the operating activity and total assets.

$$Economic_{profitability} = \frac{Operating\ profit}{Total\ assets} * 100$$

2. **Financial profitability** is the ratio between net profit and equity.

$$Financial_{profitability} = \frac{Net\ profit}{Equity\ capital} *100$$

3. **Productivity of invested capital** is the ratio of turnover derived from the fixed net assets the entity.

$$Productivity_{invested\ capital} = \frac{Turnover}{Afixed\ net\ assets}$$

4. **Development of net borrowing** calculated as the ratio between the sum of short-term debts and short-term realisable values.

$$Development_{net\ borrowing} = \frac{Short\ term\ dets}{Short\ term\ realisable\ values}$$

5. **Remuneration of labor factor** is the ratio of the total expenditure on wages and turnover.

$$Remuneration_{labor} = \frac{Total\ expenditure\ on\ wages}{Turnover}$$

6. **Rates of financial authonomy** represents equity capital to the amount of eqyuity capital and total long-term bank loans.

$$Financial_{authonomy} = \frac{Equity\ capital}{Equity\ capital+Long\ term\ bank\ loans}$$

7. **Rate of liquidity assets** current assets and expenses recorded in advance and short-term debts.

$$Liquidity_{assets} = \frac{Net\ current\ assets+prepayments}{Short\ term\ debts}$$

8. **Rotational speed of the current assets** ratio between current assets and turnover.

$$Speed_{current\ assets} = \frac{Current\ assets}{Turnover} * 360$$

9. **Low liquidity** is the difference between current assets and stocks related to the total short-term debts.

$$Low_{liquidity} = \frac{Current\ assets-Stocks}{Short\ term\ debts}$$

10. **Assets solvency** calculated as total equity and liabilities.

$$Assets_{solvency} = \frac{Equity}{Total\ liabilities} * 100$$

11. **Immediate liquidity** means the Treasury reported short-term debts.

$$Immediate_{liquidity} = \frac{Treasury}{Short\ term\ debts}$$

Table No. 4 The calculation of CEMATT models indicators at SC A SA

Nr. Crt.	Indicator	Rezultate	
		Anul 2011	Anul 2012
1	Economic profitability	4,36	5,28
2	Financial profitability	6,40	7,51
3	Productivity of invested capital	2,51	2,72
4	Development of net borrowing	1,60	1,56
5	Remuneration of labor factor	0,08	0,08
6	Rates of financial authonomy	0,83	0,87
7	Rate of liquidity assets	0,91	0,97
8	Rotational speed of the current assets	88,45	80,26
9	Low liquidity	0,67	0,69
10	Assets solvency	41,39	47,95
11	Immediate liquidity	0,04	0,04

Source: own calculations based on the financial statements of the SC A SA

In the table no. 5 the score for variation of criteria depending on the limits set for the value of the criterion, as follows:

Table No. 5 Criterion Score

Criterion	Score				
	20	40	60	80	100
Economic profitability	<4	(4,10]	(10,15]	(15,20]	>20
Financial profitability	<2	(2,5]	(5,10]	(10,15]	>15
Productivity of invested capital	<2	(2,3]	(3,4]	(4,5]	>5
Development of net borrowing	>0,80	(0,60-0,80]	(0,40-0,60]	(0,20-0,40]	<0,20
Remuneration of labor factor	>0,35	(0.30-0,35]	(0,25-0,30]	(0,20-0,25]	<0,20
Rates of financial authonomy	<0,50	(0,50-0,60]	(0,60-0,70]	(0,70-0,80]	>0,80
Rate of liquidity assets	<1,30	(1,30-1,40]	(1,40-1,50]	(1,50-1,60]	>1,60
Rotational speed of the current assets	>120	(90-120]	(60-90]	(30-60]	<30
Low liquidity	<1	(1-1,20]	(1,2-I,40]	(1,40-1,60]	>1,60
Assets solvency	<25	(25-50]	(50,75]	(75-100]	>100
Immediate liquidity	<0,25	(0,25-0,50]	(0,50-0,75]	(0,75-1,00]	>1

Then apply the scoring method and get the score for the years 2011-2012, as shown in the following table:

Table No. 6 CEMATT model method scores

No. Crt.	Coefficient of importance	Year 2011		Year 2012	
		Score	Calculated value	Score	Calculated value
1	2	40	4,36	40	5,28
2	5	60	6,40	60	7,51
3	1	40	2,51	40	2,72
4	5	20	1,60	20	1,56
5	2	100	0,08	100	0,08
6	1	100	0,83	100	0,87
7	1	20	0,91	20	0,97
8	1	60	88,45	60	80,26
9	5	20	0,67	20	0,69
10	1	40	41,39	40	47,95
11	5	20	0,04	20	0,04

Source: own calculations based on the financial statements of the SC A SA

Then the aggregate note is calculated according to the following formula:

$$\text{aggregate note} = \frac{\text{Coefficient of importance} * \text{Points awarded}}{\text{the sum of the coefficients of importance}}$$

$$\text{aggregate note}_{2011} = 39{,}31$$

$$\text{aggregate note}_{2012} = 39{,}32$$

The value of aggregate note means the following:

-If the aggregate value of note 50 → < entity does not obtain outstanding financial performance

-If the value of the aggregate entity obtain > 50 → outstanding financial performance

In calculating the aggregates to the SC to we can see that its values are almost identical in the two years study with smaller values of 50, which means that the entity has obtained financial performances in the years 2011-2012. This fact is evident from the fact that the indicators presented in the financial statements of the entity had no visible variations from one year to another.

CONCLUSIONS

Determination of "health status" of companies is an important activity since the diagnosis may determine what measures to be taken by the managers for the companies to withstand the competitive environment. In the present circumstances when the global financial crisis manifests itself more acutely important for companies is necessary for them to set goals to overcome the financial crisis in that country. It is recognised that financial diagnosis is an important component of the overall diagnosis, through the system of indicators presented reflects the company's performance at any given time. However many would use indicators in financial diagnosis, whether it would not be correlated with the other components of the overall diagnosis, the results wouldn't be conclusive. Company bankruptcy prediction can be prevented by using financial diagnosis within their prime methods namely ALTMAN, CANON-HOLDER and CEMATT. Conculzia removed as a result of those three methods on the financial statements of the COMPANY in the period 2011-2012 is that at present the method CEMATT is the method that best meets the needs of the Romanian economy analysis.

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