CASE STUDY ON BANKRUPTCY RISK ANALYSIS IN A LIMITED LIABILITY COMPANY

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Abstract: *Uncertainty and risk are two coordinates of the economic environment in which companies operate and measuring them and determining the influences they induce on economic phenomena is a permanent problem for managers. It is obvious that decisions are substantiated and pertinent when the person who adopts them, as well as those who apply them, are well informed and able to master the effects of change. There is a convergence of the opinions of those who study the economy and, especially, of those who work in this field, according to which the risk in business is something normal. It is a natural and unremovable component of the business world.*
Keywords: *Bankruptcy risk analysis, The Altman model, the solvency analysis*

1. INTRODUCTION

Conducting an analysis of a company is of vital importance because it is conducted to highlight the strengths and weaknesses of the commercial company, as well as the opportunities or dangers in the external environment, focusing also on the causes that unbalance or favor the activity and development of the company.

Finding the criteria and causes that could make a company go bankrupt is extremely important because it can be used by any manager, regardless of the hierarchical position in the organizational structure, in increasingly varied situations.

The risk depends not only on the general factors (sale price, cost, turnover), but also on the cost structure, respectively on their behavior towards the volume of activity. The risk of economic activity or the exploitation risk "actually presents the risk related to the slowdown of operating (production) returns. It depends on the grouping of fixed and variable production costs and their correct determination.

The multitude of factors, which generate business risk, determine its manifestation in different situations, respectively:

- "Market risk
- Economic (operating) risk
- Financial risk
- Risk due to changes in technology.
- Currency risk
- The risk of bankruptcy (insolvency)"[18]

Bankruptcy "is not a brutal phenomenon, but a result of a gradual degradation of the company's financial situation, the risk of insolvency being predictable several years before the cessation of payments."[19]

The scoring method is an external diagnostic method that aims to measure the risk to which the investor, the creditor, and the company itself are exposed in the future activity.[20]

Worldwide, there are several models developed especially in developed countries: USA (Beaver, Altman, and others), UK (Taffler), France (Conan and Hoder, Bank of France, and others), Japan (Shirata), and others.

The Altman model[21] , also called the **"Z" model**, is a bankruptcy forecast model developed by Professor Altman in the USA, in 1968[22]. He combined the information provided by five rates (variables) by constructing a "score" function as follows:

$$\mathbf{Z = 1{,}2\ X_1 + 1{,}4\ X_2 + 3{,}3\ X_3 + 0{,}6\ X_4 + 1{,}0\ X_5}$$

where:

Variable X1 is an asset structure rate that reflects the flexibility of the company and is determined as a ratio between working capital (current operating assets – current operating liabilities) or the working capital and total assets:

18 Şuşu, Ştefăniţă (2019). „Riscul – componentă firească în lumea afacerilor", accesibil http://www.oeconomica.uab.ro/upload/lucrari/820063/28.pdf, accesat decembrie 2022 ("Risk - natural component in the business world", accessible http://www.oeconomica.uab.ro/upload/lucrari/820063/28.pdf, accessed December 2022)

19 Petrescu, Silvia. (2010). Diagnostic economic-financiar. Metodologie. Studii de caz, Editura Sedcom Libris, Iaşi, p. 186 (Economic-financial diagnosis. Methodology. Case studies, Sedcom Libris Publishing House, Iasi, pp. 186)

20 Sabău, C. Nagy, Cristina Mihaela. Uher, Marina. (2014). „Contabilitatea reorganizării şi lichidării întreprinderii". Editura Eurostampa, Timişoara. P. 168 ("Accounting of the reorganization and liquidation of the enterprise". Eurostampa Publishing House, Timisoara. pp. 168)

21 Altman, E.I. – "Financial Rations, Discriminant Analysis and Prediction of Corporale Bankruptcy", Journal of Finance, 1968.

22 Holt, Gheorghe. (2009). „Riscul e faliment – punct central în diagnosticul financiar-contabil", Analele Universităţii „Constantin Brâncuşi" din Târgu Jiu, Seria Economie, nr. 3/2009, p. 328. ("Risk is bankruptcy - central point in the financial-accounting diagnosis," Annals of the University "Constantin Brâncusi" from Târgu Jiu, Economy Series, no. 3/2009, pp. 328)

$$X_1 = \frac{current\ assets}{total\ assets}$$

or

$$X_1 = \frac{working\ capital}{total\ assets}$$

Variable X2 stands for the self-financing rate of total assets and is determined as the ratio between the reinvested profit (net result of year – dividends granted to shareholders) and total assets:

$$X_2 = \frac{reinvested\ profit}{total\ assets}$$

Variable X3 stands for the rate of economic profitability, measuring the performance of the patrimonial asset and is calculated as the ratio between the gross result of the year (gross profit) and total assets:

$$X_3 = \frac{gross\ profit}{total\ assets}$$

Variable X4 highlights the company's debt capacity and is calculated as the ratio between stock market capitalization and long-term debts:

$$X_4 = \frac{market\ value\ of\ the\ capital}{ong-term\ obligations}$$

Variable X5 measures the return on assets and is calculated as the ratio between turnover and total assets:

$$X_5 = \frac{turnover}{total\ assets}$$

The solvency analysis of the company aims at its ability to pay its total obligations from the total resources, and on the basis of this indicator, the risk of total inability to pay in the long term can be assessed.[23]

***"Solvency** is the ability of a legal entity to pay its debts to its creditors on maturity."*[24]

"When the obligations that have reached maturity can no longer be paid, it is said that the company has entered into payment cessation and the bankruptcy procedure is initiated."[25]

23 Sabău, C. Nagy, Cristina Mihaela. Uher, Marina. (2014). „Contabilitatea reorganizării şi lichidării întreprinderii". Editura Eurostampa, Timişoara. P. 147 ("Accounting for the reorganization and liquidation of the company". Eurostampa Publishing House, Timisoara. pp. 147)

24 Gostin, Cecilia. (2018). „Elemente de economie şi analiză financiară a întreprinderii pe bază de bilanţ". Proiectul "Abordarea provocărilor generate de noua legislație a muncii și a dialogului social în România" P.25 ("Elements of economy and financial analysis of the company based on the balance sheet". Project "Addressing the challenges generated by the new labor legislation and social dialogue in Romania" pp. 25)

25 Untaru, Mircea. (2013). Analiză Economico-financiară. Editura fundației pentru cultură și învățământ „Ioan Slavici". Timișoara. p. 128 (Financial and economic analysis. "Ioan Slavici" Foundation

Solvency is expressed by the net accounting asset (Naa) and solvency ratios, namely patrimonial solvency, total or long-term indebtedness ratio, debt capacity.[26]

2.CASE STUDY

TETA S.R.L. company[27] , where the case study was conducted, has as its main object of activity according to CAEN code 4719 - Retail trade in non-specialized stores with predominant sale of non-food products, and was established in1994, being a company with private capital, having a sole associate.

TETA S.R.L. is a medium-sized company that offers a narrower range of products, marketing brands that focus on specific segments such as men's and women's clothing from casual to luxury clothing.

The analysis of the bankruptcy risk at TETA S.R.L. will be conducted based on the latest financial and accounting statements using the score method, namely the Altman model or the „Z" model, as well as the solvency and liquidity indicators.

2.1. Bankruptcy risk analysis using the score method - Altman model or „Z" model

As we have seen in the specialized literature, the Score Method aims to provide predictive models for assessing the bankruptcy risk of a company. Thus, a Z-score is obtained, a linear function assigned to the company, as follows:

$Z= a_1*x_1+ a_2*x_2+ a_3*x_3+……+ a_n*x_n$

where:

x- represent the rates involved in the analysis,

a- represents the weighting coefficient of each rate.

The "Z" model is a bankruptcy forecasting model that includes five variables considered to be the most representative for a company, namely:

- flexibility of the company (R1),

for Culture and Education publishing house. Timisoara. pp. 128)

26 Bâtcă-Dumitru, Corina-Graziella. Sahlian, Daniela-Nicoleta. Irimescu, Alina-Mihaela. (2018). Contabilitate și raportare financiară. Ediția a II-a, revizuită. Editura CECCAR. București. p. 344 (Accounting and financial reporting. 2nd Edition, Revised. CECCAR Publishing House. Bucharest. pp. 344)

27 TETA S.R.L. este o societate reală, însă pentru protecția persoanelor cu privire la prelucrarea datelor cu caracter personal și libera circulație a acestor date", **numele societății a fost atribuit** în **mod convențional** (TETA S.R.L. is a real company, but for the protection of individuals with regard to the processing of personal data and the free movement of such data, **the name of the company was conventionally assigned)**

- total asset self-financing rate (R2),
- economic profitability rate (R3),
- financial independence (R4)
- asset return (R5).

In the following, we will analyze for the company TETA S.R.L the function established by the "Z" Model, which has the following form:

Z = 1.2*R1+ +1.4*R2+3.3*R3+0.6*R4+0.999*R5

The values of the Z function against which the company will be characterized are those presented in table 1.

Table no.1 Values of the Z function

Value of the Z function	Situation of the company	Risk of bankruptcy
Z > 2,675	Good - solvency	Reduced - non-existent
1.81 < Z < 2,675	Precarious - difficulty	Indefinite
Z < 1,81	Hard - difficulty	Imminent - maximum

The calculations based on this formula are summarized in table no. 2.

Table no. 2 Calculations on the value of the Altman function

DESCRIPTION	31.12.2020	31.12.2021	31.12.2022
R1 = Current assets/Total assets - expresses the share of working capital in total assets	0,801	0,697	0,171
R2 = Reinvested Profit/Total Assets - expresses the internal financing capacity	0,000	0,000	0,000
R3 = Gross Profit/Total Assets - expresses the return on assets	-0,326	-0,466	-1,760
R4 = Equity/Total Debts - measures financial independence	-0,396	-0,490	-0,842
R5 = Turnover/ Total assets - measures the turnover rate of assets	0,517	0,238	0,742
Value of the Z function	0,165	-0,755	-5,366
Interpretation of the result	**high risk of bank-ruptcy**	**high risk of bank-ruptcy**	**high risk of bank-ruptcy**

Source: Annual financial statements and own calculations

Using the Altman function model (Z) (see Table no. 2), it was ascertained, according to the financial-accounting situation that the company TETA SRL, starting from 2020 has a value of the Altman function of 0,165, so a high risk of bankruptcy, this fact is due to the economic circumstances in which our country is, which led to the decrease in equity, turnover, and the increase of registered losses.

In 2022 the situation is the worst, the value of the Altman function being minus 5,366, so there is high risk of bankruptcy.

The conclusions obtained from the application of this model to the company TETA S.R.L reveal that from 2020 the company was in a difficult situation, then, not wanting to pay off its debts and getting worse.

2.2 Bankruptcy risk analysis using solvency indicators

Through the solvency analysis, TETA S.R.L.'s ability to pay its total debts based on total resources is monitored, following the risk of long-term total inability to pay.

The solvency criterion compels the company to ensure the financial means necessary to pay the outstanding debts. In these circumstances, the company must ensure a sufficiently high working capital to honor its due payments at any time.

Table no. 3. Calculation of solvency indicators

	I. Solvency indicators (SR)	**2020**	**2021**	**2022**
1	TOTAL ASSETS (TA)	192.258	255.260	68.653
2	TOTAL DEBTS (TD)	318.262	500.120	434.346
3	**Accounting net asset= TA–TD (> 0)**	**-126.004**	**-244.860**	**-365.693**
4	Equity (Eq)	-126.004	-244.860	-365.693
5	TOTAL Liabilities (TL)	192.258	255.260	68.653
6	**Equity SR = Eq / TL (> 0.5)**	**-0,655**	**-0,959**	**-5,327**
7	**General SR** = TA / TD (> 1)	**0,604**	**0,510**	**0,158**
8	**R of total indebtedness** = TD/ Eq **(<2)**	**-2,526**	**-2,042**	**-1,188**

Source: Own processing

From Table 3 we notice that in 2022, but also for the entire analyzed period, the debts contracted by the company were higher compared to the assets held, the net accounting asset registering negative values, while, increasing from minus 126.004 lei in 2020 to minus 365.693 lei in 2022. The negative net situation signifies an excess of the assets by debts and announces the bankruptcy of the company. The situation may be due to losses from previous exercises, which completely consumed the equity. The uncovered part falls to the creditors, who have assumed the risk of the company's insolvency.

From Table 3 it can also be observed that the patrimonial solvency of TETA S.R.L has negative values both at the beginning of the analyzed period and at the end of the period, respectively, minus 0,655 in 2020 and minus 5,327 in 2022, which is an unfavorable aspect, as it decreased due to the profitability of TETA S.R.L (the company's result being a loss). The general solvency (The Solvency criterion obliges the company to provide the financial means necessary to pay the outstanding debts) is less than 1, so the company is insolvent. In the present case, the values recorded by TETA S.R.L are below normal limits, so under these conditions, the company can NO longer honor its due payments.

From the previous table, we also note that the Coefficient of total indebtedness should have values less than or equal to 2, and in the case of TETA S.R.L. it is negative from the beginning of the period (respectively minus 2,526 in 2020) and minus 1,188 in 2022. This is unfavorable for TETA S.R.L reflecting the fact that the company's equity is insufficient to cover the total debts of the company.

2.3. Bankruptcy risk analysis using liquidity indicators

The liquidity analysis will assess the ability of TETA S.R.L to pay short-term debts based on existing resources, or in other words, the ability of TETA S.R.L to transform assets into money at a given moment, in a brief period of time.

Table no. 4 Calculation of liquidity indicators

II. Liquidity indicators (LR)		2020	2021	2022
	Current Assets (CA)	153.955	177.962	11.742
	Total Short-Term Debts (StD)	318.262	500.120	434.346
1	**Financial working capital = CA – StD(> 0)**	**-164.307**	**-322.158**	**-422.604**
2	**General LR = AC/StD (> 1)**	**0,484**	**0,356**	**0,027**
	Inventories	152.390	174.983	11.149
3	**Reduces LR = CA – Inventories/ StD (> 0.5)**	**0,005**	**0,006**	**0,001**
	Cash availability (Petty cash and bank accounts)	1.565	246	593
4	**Quick LR= Db /StD (> 0.2)**	**0,005**	**0,000**	**0,001**

Source: Annual financial statements and own calculations

From Table 4 we notice that the Working capital (WC) recorded negative values, so for TETA S.R.L the situation is problematic, because the current needs are not covered from permanent resources, so the company will have to resort to the available resources on the credit money market, which it will no longer be able to do, given that it has nothing to guarantee them with. Therefore, it will no longer be able to cover its operating needs (purchase of materials, payment of obligations to employees and to the state budget, which are already large), therefore TETA S.R.L can no longer adjust the gap between the duration of the receivables and debts.

Also, from Table 4 we observe that the general liquidity rate is the most frequently used indicator for assessing the liquidity degree. The general liquidity ratio shows the margin given to the company by its current assets in complying with its current obligations. Thus, during the analyzed period, the general liquidity rate recorded values below the optimum level, in 2022 being 0,027, so in the case of TETA S.R.L, we can say that the general liquidity does not exist, as well, so the rights of creditors in the short term are not covered by the value of the assets, which can be converted into cash, that is why TETA S.R.L registers outstanding payments with influence on the company's cash and financial flows.

This indicator must have a value higher than 1 for a company to have

good liquidity, which in the case of our company under review tends to zero.

From Table 4 we observe that the reduced liquidity ratio recorded values, in the period 2020 - 2022, below the optimal value (greater than 0,2), reflecting an inability to repay short-term debts. This rate indicates when it takes subunit values, as in the present case, that the company finances its stocks through short-term deferred payment debts.

3. CONCLUSIONS

The analysis of bankruptcy risk can be conducted by liquidity and solvency analysis; financial balance analysis and through statistical bankruptcy analysis models (score method, we chose the Altman model).

The lack of liquidity causes the company to resort to debt, given that reduced profitability does not allow it to attract capital from investors. For any company, it is of interest to know the financial structure with which it can conduct a profitable activity, namely the level of indebtedness to which it can appeal, so that it does not involve financial risk.

It is important for the functionality and sustainability of societies that the economic balance, expressed through a high degree of profitability, coexists with the monetary balance, translated by the constancy of liquidity and solvency. The inconsistency between these two balances does not present a high degree of danger to the company if it manifests itself in the short term or at the beginning of the company's life. In the latter case, the company has the necessary liquidity to establish a proper patrimonial structure, although it lacks the profitability that will appear over time, through the effect of investments.

Using the Altman function model (Z), it was found, according to the financial and accounting statements, that TETA S.R.L starting from the year 2020 registers an Altman function value of 0,165, so a high risk of bankruptcy, this fact is due to the economic circumstances faced by our country, which led to a decrease in equity, turnover, and an increase of the registered losses.

The worst value of the Altman function is registered in 20222, being minus 5,366, so there is a high risk of bankruptcy.

The general solvency, which is the solvency criterion, obliges the company to provide the financial means necessary to pay the outstanding debts, is less than 1, so TETA S.R.L is insolvent, under these conditions, the company can NO longer honor its due payments.

The total indebtedness ratio should have values lower than or equal

to 2, and in the case of TETA S.R.L it registers negative values throughout the period, reflecting that the company's equity is insufficient to cover total debts.

In the analyzed period, the general liquidity rate recorded values below the optimal level, in 2022 being 0,027, so in the case of TETA S.R.L, we can say that the general liquidity does not exist, so the rights of short-term creditors are not covered by the value of the assets, which can be transformed into liquid money, therefore TETA S.R.L registers overdue payments with influence on the company's cash and financial flows.

The general causes that contributed to the bankruptcy of TETA S.R.L. are:

- Obtaining a negative accounting net asset, which shows that TETA S.R.L does NOT have sufficient assets to cover the contracted debts. The negative situation reflects an unhealthy economic situation because the debts accumulated by it grow faster than the assets of TETA S.R.L and the net profits are negative, that is, loss.
- The low volume of cash availability has implicitly led to reduced possibilities to deal with the due debts, their non-payment leading to financial difficulties, thus aggravating the financial situation of TETA S.R.L.
- The regression of the economic activity of the company was determined by the decrease in sales and implicitly in the turnover.
- Payment of obligations towards employees and towards the state budget after the legal term has generated the calculation and collection of interest and penalties.
- Negative value of the company's equity due to the result of the negative fiscal year (loss) obtained throughout the period.

From the analysis conducted we can say that the occurrence of the insolvency state of TETA S.R.L was due to some conjunctural factors, in fact the management bodies of the company are also concerned, respectively the death of one of the associations, who was also administrator.

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