Emerging Markets Queries in Finance and Business

Diagnostic model of the risk of bankruptcy

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Abstract

In Romania, on the background of the economic crisis and globalization of markets, the external and internal environment becomes more and more hostile and as such, many commercial societies, can record financial disturbances or even bankruptcy. Ignoring drawn signals (the level of some economic-financial indicators) following a correct diagnosis can lead to degradation of economic and financial condition of the company entering insolvency. The study conducted by the author, on a guided sample of small companies in Romania aimed to develop a model of financial diagnosis, which can quickly reflect, based on the level of a score, the probability of the insolvency or bankruptcy of the company.

Keywords: Diagnosis; Insolvency, Risks;

1. Introduction

In this period, marked by political, economic changes, fierce competition from foreign companies and so on, the company is becoming more vulnerable and exposed to higher risks.

As such, the diagnosis of companies, with a view to the elaboration of present and future decisions, is increasingly required. In most of the cases the diagnosis of the trading companies is acclaimed only when the company is in financial difficulty; however, companies with a responsible management uses this tool continuously, even when their financial performance is high.

On the basis of the study, it emerged the main causes that led to the entrance in insolvency or bankruptcy of the analyzed companies. These are external causes (external competition, rising raw material prices, the disappearance of foreign markets, low incomes for people, etc.) [Edward I. Altman, 2007, p 6] and internal causes (unsatisfying management, equipment no longer complies with the technical point of view, outdated

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technology, research, etc.). All these causes have a direct influence on the Treasury (cash in hand and cash in bank accounts plus short term investments). The failure to pay these debts at the due date will generate pressures from those who should collect them, having chronic implications in the economic-financial situation. Existing money at a time can be explained not only by the available accounts (receipts, payments), but also by the data presented in the balance sheet and profit and loss:

\[
\text{Cash in hand and cash in bank} = [(\text{NP} + \text{OCAR}) + \text{LD}>1\text{ year} + \text{CD}<1\text{ year}] - \text{FA} - \text{NWC}
\]

(1)

Financial performance

\[\text{Funding from own sources and borrowed investment needed to exploitation}\]

Where: NP - Net profit; OCAR - Other capital and reserves; LD > 1 year - debts paid over a year, CD - debts paid during a year, FA - fixed assets, NWC - need for working capital

Based on this equation, the funds available (Cash and bank accounts) at any given time is the result of financial performance (NP), policy of distribution of dividends (retained earnings), policies of investment (Fixed assets), an policy of circulating assets management (ΔNWC), and policies to their financing (OCAR + LD > 1AN + CD < 1 year).

2. Method

Studies conducted so far, reveals the fact that the economic and financial condition of a company is determined by both financial factors and the factors of non-financial kind [Fengyi Lin, 2010, p.3]. The factors of non-financial nature, will ultimately determine the alteration of a financial nature.

In consequence, financial performance, financial position, cash flows are the result of efficient management of human, technical, financial resources, or commercial relationships good customer (market share) and suppliers etc. Financial information can be known by any interested person through the annual financial statements, which are mandatory and are published by all the entities in Romania [OMFP 3055/2009]. The method used in the conducted study, suppose the calculation of a score on the basis of selected financial rates.

Financial diagnosis presented is focused on those financial installments, which indicate the profitability (economic), risk (operational, financial, bankruptcy), liquidity (liquidity, solvency, cash flows).

In the study, the risk of bankruptcy is analyzed both in a static manner (balance sheet and profit and loss account) as well as dynamic (balance sheet and profit and loss account).

3. Results

The score is obtained on the basis of 6 indicators selected by the author from a group of several indicators. One can appreciate that between certain rates there is a strong link, as demonstrated by the values of the multiple correlation coefficient. But the need for a more detailed analysis of return, risk and liquidity and an easier interpretation of the score obtained, justifies the use of these indicators. The study conducted involved several steps.

The first stage of the study implied a retrospective and present economic-financial analysis on a sample composed of 34 companies that were under the following circumstances: financial difficulty; having a normal economic and financial situation; or having a very good economic and financial situation. As a result of the analysis process the main causes that generated these situations were outlined.

The second phase of the study implied the selection of by the author, of some rates considered to be representative to highlight the financial performance, the financial balances, the payment capacity, the risks etc. The arguments that formed the basis for the selection of these rates were:

a) as first argument, the causes which determine the financial imbalances and possibly the bankruptcy;
b) and as a secondary argument, this equation that highlights available cash.

All the activity undertaken in a trading company is under the aegis of efficiency, as a mandatory condition for maintaining itself on a competitive market. The synthetic economic and financial efficiency is measured through rates (return on sales, profitability, Return On Assets, Return on equity). Between these rates, in fact, is a deterministic relationship. Because that influence profitability may not be multiplied by the score result I selected just the rate of economic profitability, which quantifies the resource consumption involved. The calculation of this rate was performed as a ratio between earnings before interest, taxes, depreciation and amortization (EBITDA) and invested capital (assets in use).

Through her level, it offers synthetic information on price policy, product quality, customer satisfaction, cost management, the effort made (assets level) so far to achieve this performance.

The imposed lower limit is laid down on the idea that the economic profitability will be superior to the average interest rate on credits contracted on the Romanian market, thereby confirming the fact that the resources borrowed by society have a degree of efficiency enough to cover the cost of debt and, in addition to achieve a raised profitability.

A surplus of earnings before interest, taxes, depreciation and amortization, from the mathematical point of view, involves a maximization of the monetary from the operating activity income in relation to the monetary costs from the operating activity. In the absence of financial performance (NP) or in case of not collecting receivables, at a certain level of availability, financing the investments and the operating activity (the existence if not also the growth of the trading company), involves appealing to borrowed sources.

The increase of indebtedness ($\Delta TD$), will determine the cost increase by interest, which also implies a more pronounced decrease of the profit and an increase of the financial risk.

For the amounts borrowed, managers appreciate the possibilities of payment through cash flows resulting from the company's activity, and as a precautionary measure, through liquidity arising from the sale of assets held.

Thus, obligations to maturity check whether they can be covered by the resulting liquidity by selling current assets (LI) and for total obligations check whether they are covered in a certain proportion of the total assets held (SF). If the annual repayments to the lenders for the previously contracted amounts are not covered by the cash flows resulting from the management (E-IP), but from the contracting of new loans in the future, the economic and financial situation will aggravate in the future. The pointer contained in the model and which, through its level, reflects the coverage rate of the loan repayment and interest (RLR+I) on medium or long term is the rate of repayment of the debts that are overdue. Financing of investments of temporary resources will worsen and more financial situation. Current Liquidity and the financial equilibrium rates will refer to this phenomenon.

Current liquidity > 1, reflects a short-term financial balance, but also a low rotational speed of the circulating assets in relation to the speed of rotation of the debt of less than one year. In consequence of too high values of this indicator are not recommended. Indebtedness (short and long term) high is one of the leading causes of bankruptcy. The coverage of total debt through assets held is reflected through the solvency. The inverse of financial solvency reflects the degree of indebtedness.

The minimum level of financial solvency in the model is a degree of indebtedness 75%.

Decisions on investment, exploitation, their funding should be considered taking into account the financial balances and the cost of those resources. Even though at one point a resource borrowed has a lower cost, the financial risk is higher than in the case of a call from an internal source. A cautious policy on investments and their financing (financial equilibrium in the long term), involves coverage of investments from permanent resources.

By these measures, the company has a safety margin (WC), helping where appropriate to financial balance in the short term. Operating activities should be financed for the most part from resources attracted (suppliers, employees, shareholders, etc.) and revolving fund. Only if these resources are not sufficient, we need for short-term loans.
In the case where in the equation 1 financial liabilities less than one year are shown on the left-hand side of the equation we obtain net cash flow indicator: Cash –\(\Delta C<1\text{ year}\)=\[ (\text{Capital and reserves}+\text{DF}>1\text{ year}) -\text{FA}\] - NWC i.e. TN=WC-NWC, indicator that by the level or reflect financial balances at company level. In the case of a deficient balance of the Treasury, the first measures should aim at advancing some receipts and delaying the payment of some payments, not calling in credits (short term credit banks).

A coherent policy on the management of clients and suppliers requires a negotiation of terms of payment and cashing, such as cashing should be carried out in shorter terms than the payments.

If the static analysis of the balance sheet and the profit and loss account shows financial imbalances at some point, they will be able to be explained by the dynamic analysis of the flows of funds and cash flows.

From equation 1 shows that net cash flow is the amount of cash flows from operating, investing, and financing.

\[
\Delta CF=\[(\text{NP}+\text{A}+\text{DA})-\Delta \text{NWC}] - [\text{\Delta FA}+\text{A}+\text{DA}]+[(\Delta \text{RC-NP}) +\Delta \text{LD}>1 \text{ year} +\Delta \text{CD}<1 \text{ year}]
\]

Cash Flow

Cash flow from exploitation activities   cash flow from investment activities   cash flow from financing activities

RC – Rațio capital; NP- Net profit; A-Amortization; AD- depreciation adjustment; \(\Delta LD\)- debts variation paid over a year; \(\Delta CD\)- debts variation paid during a year, \(\Delta NWC\)-- variation in working capital needs.

The net cash flows from operating remaining after the economic growth (\(\Delta FA + \Delta NWC\)) actually serve to the remuneration of the creditors and shareholders. However, the creditors have priority, being remunerated by interest. The shareholders in accordance with the criterion of the rest are remunerated from the net profit.

Directly, the annual investment and the proportion of their funding from own sources (auto-financing), remaining after the payment of the dividends, are reflected by the rate of self-financing. Self-financing is wealth created in society and left in its control (source with a lower cost than the average cost) and is considered in certain situations, the most efficient solution to cover the permanent needs and to ensure the financial independence. Unfortunately, it is insufficient in most of the cases.

In the third stage, keeping the indicators (the rates) within the bonds of certain values (limits) considered normal in financial terms. These limit values, within the bonds of which the rates are kept, were established on the basis of the recommendation of some financial institutions and others are the result of the author's reasoning (displayed above) and checks and simulations carried out on a sample taken in the study (firms in difficulty, firms with superior financial performance and a good economic situation). The three areas (intervals) delineated for each rate are: the lower zone below the lower limit; the middle area between the lower and upper areas; the upper zone above the upper limit.

Table 1-Financial diagnosis model

| Economic indicators | The three zones delineated and points awarded |
|---------------------|-----------------------------------------------|
| Return on asset     | The upper limit 1: EBITDA/TA [%] >15 |
|                     | The interval between the two limits 0-5: 10-15 |
|                     | The lower limit 0: <10 |
| Quick ratio (Acid test ratio) | [CA-I]/CL >1 | 0-5 <0,5 |
| Total assets /Total | TA/TD >1,6 | 1,5-1,6 <1,3 |
In the fourth stage, on the basis of the results for each indicator, points are assigned \((n_i)\) as follows: -0 for enrolment in the lower zone; -0.5 for the intermediate area; -1 for classification in the upper zone (these points are the equivalents of Unsatisfactory, Satisfactory, Good ratings) [Bircea Ioan, 2012, p.1138]..

In the fifth stage, it will be calculated by addition, the final score, on the basis of the points rating result for each indicator \(N = \sum x_i\). The maximum number of points is of 6 points, and the minimum number is of 0 points. This interval between 0-6 will be divided into 4 grouping intervals. The groups established in this manner shall be considered homogeneous having in mind the medium in each group and the coefficient of variation. The evaluation grid for the financial diagnosis is as follows:

| Group interval | State Society of financially | The probability of bankruptcy |
|----------------|-----------------------------|------------------------------|
| 0-1,5          | Unsatisfactory              | Very high probability of bankruptcy |
| 1,51-3         | Satisfactory                | High probability of bankruptcy |
| 3,01-4,5       | Good condition              | Low probability of bankruptcy |
| 4,51-6         | Very good condition         | Very low probability of bankruptcy |
4. Discussion

As a result of a comparative analysis of models of financial diagnosis drawn up by banks (Model BRD, Raiffeisen Bank, etc.), we have found that these models check the coverage capabilities of the debts of their liquidity resulting from the work carried out and underlined that a measure of sale of assets.

The models developed by specialists (MEFAT model, model AG, ALTMAN, CONAN-HOLDER etc.), as a result of studies of multiple regression, on data from a sample [Li Jen Ko, 2001, p72]. I assume financial ratios selection based on their independence or a weak correlations between them.

Even if at the time of their drafting these models were of a reasonable accuracy, in time, unless measures are taken to update the variables considered and or recalibrate the model, their accuracy will diminish.[Armeanu and col, 2012, p. 100].

Diagnostic methods with a large number of indicators (SWOT matrix), I assume a knowledge and rich experience in economic and financial analysis, to be able to interpret the resulting values of these indicators.

I consider being more objective the method based on the points resulted from classifying the indicators between certain limits considered normal from a financial standpoint. Overcoming these limits, by means of the resulting values of the indicators, are due to causes that can trigger or worsen the health of companies.

5. Conclusions

Financial diagnosis submitted is checked only for a sample composed of small companies in Romania, listed or unlisted. In some situations, the manager has to make fast and pragmatic decisions, as such he needs radiography of the economic-financial situation (to identify the causes of the dysfunctions), estimates the risks to which the company is exposed in order to determine the measures to be taken. In this context we recommend the proposed model of financial diagnosis both to managers -as a support for financial decisions, to banks- for analyzing their clients with a view to giving them a credit, and to all those interested in the knowledge of the economic-financial situation and internal risks.

The results that we got through this model correspond in many situations with the results obtained by applying the models and specialists of banks.

The model shown takes into account only the financial aspects, neglecting the aspects of a non-financial nature, considering them, to a certain extent, to be responsible for the evolution of the others [Bircea Ioan, 2012, p.1139]. A more complex model of diagnosis that analyzes the company also from different points of view: judicial, commercial, human resources, technical potential, managerial activity etc., implies a thorough documentation, time and financial resources etc.

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