



Review on financial risk procedures for assessing companies

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Financial risk procedures are used by financial analysts for their researches. In this paper we present a sum-up of manager's tools for assessing the liquidity and activity ratios of its company and a series of financial risk procedures. We descriptive investigate various financial risk procedures present in financial literature and we identify the predictive ability of the risk groups for assessing the performance and the risk of a company. Our purpose is to get a direct relationship between risk and performance.

Keywords: ratios; financial risk procedures; performance; bankruptcy; stock performance; strategic procedures.

JEL Codes: G30; G39

1 Introduction

Companies are getting more sophisticated in managing the leverage inherent in their way of financing expansion in the actual economy. This sophistication is particularly true of entities that realize that managing financial risks is the key to their survival, as the focus shifts from the stock of goods sold to financial well-being. The problem is that they have to master all matters involving exposure in a global economy: not only credit risk, interest-rate risk, currency risk but also equity risk, operational risk, legal risk, insurance risk and cross-border risk. Generally issues created through leveraged business activity can best be appreciated from their consequences, after they burst. Up to a point, the majority of financial difficulties might be predicted if we learn from past experiences and we project what we have learnt into the future. The more one deal is tentative, the more the analyst must take risk into account. This ability to forecast is, to a significant extent, a mood and a handcraft art that often points to unpleasant news. The purpose of the present study is the inspection of the financial literature so as to identify which financial risk procedures are best used for estimations and analysis of credit risk in various contexts. At company level, some

financial credit risk procedures may represent the financial risk better than others in the credit financing setting. The determination of our examination is to descriptively investigate financial literature various firm financial risk procedures which might be further be used in the banking system to qualify the credit risk. In the end, we intend to identify the predictive ability of risk factors for shaping the capacity of reimbursement of a firm and its performance.

2 Literature review

Companies' balance sheet, income statement and statement of cash flow are still most used sources to evaluate the performance of the entity despite the fact their reliability has been questioned because of very big scaling accounting scandals, such as Enron (2001) and Worldcom (2002). Financial researchers of conventional accounting, finance, and strategic management use various financial risk procedures for their studies; this applies to financial researchers of the banking industry as well. Examples of those financial risk procedures are variability of earnings, probability of bankruptcy and similar accounting procedures such as book-to-market ratio and debt-to-equity ratio. The analysts frequently rely on specific accounting-based measures, such as Altman's (1968) Z-Score and Ohlson's (1980) O-Scores as proxies for the risk of bankruptcy. Evaluating a firm's value is top importance not only for shareholders but also for financial institutions and researchers in that area. Cupertino and Lustosa (2004) refer to different literature to highlight the importance of the ability of evaluating assets with precision and states that this is at the heart of theory of finance because many personal and business decisions are to be made by the selection of alternatives that maximize economic value. Achieving a profit increase can be provided by reducing uncertainty, the risk assumed in economic activity. If there were no uncertainty, then it would know all the elements that lead to achieving profit operators will ensure that revenues are greater than costs and would be an increase of supply over demand which will lead to a balance between revenue and expenses and profits would be zero.

The neoclassical theory of risk, whose theses have been written by A. Marshall and developed by A.C. Pigou, a firm operating under conditions of uncertainty and whose income is a random variable, is considering the following aspects: • the amount of expected profit; • size of possible profit fluctuations. Starting from the theory of marginal unit, Marshall and Pigou tried to base the behavior developer. Thus, if there are two possible variants that give the same expected profit, the developer choose the option that is less than the expected profit fluctuations. A decision requires choosing for obtaining the same profit, but in terms of minimum fluctuations. Fundamental thesis of neo-classical theory of risk is "for a higher expected return, the developer is ready to accept a higher risk." (Pigou, 2009). The concept of risk is financial, hence the need to capture and predict the magnitude of. Profitability is expected that, for future period, has the highest possibility to be achieved. The competitiveness of a firm involved in making a diagnosis or a critical inventory of available capacity, ie the forces and weaknesses of all parts of the company, with particular reference to

key success factors and competition. It depends on the proper functioning of all its components.(Russu, 1998)

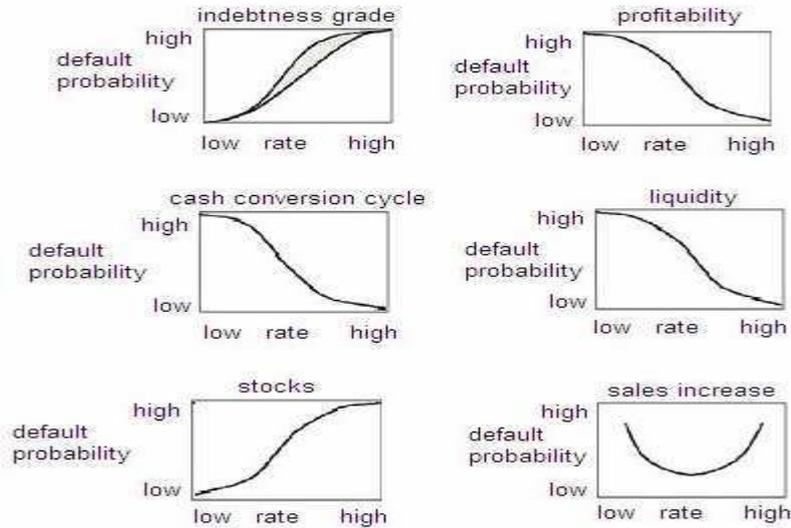
2.1 Liquidity ratios and activity ratios as tools for the management of a company

“To succeed in this world,” as entrepreneur Sam Walton said, “you have to change all the time.” The financial analyst has to be selective in one’s choice of ratios, because accounting literature presents over 100 financial ratios as “standard.” In the main some of these complement one another, but others are useful and go beyond assessing the performance of a company. Here we present the financial ratios considered to be the more important for analyzing the credit risk of a company in both aspects past performance and future performance. We should point out that their critical values tend to change over time as leverage becomes an accepted practice. The ratios may be grouped by:

1. Leverage - the higher this ratio is, the greater the likelihood of default.
2. Profitability - a higher profitability lowers the default likelihood
3. Current ratio – In past years, the current ratio had to be 2.5 or greater, later it became 2.0 and kept on decreasing. Considering leverage also, it can be even less than 1.
4. Quick ratio
5. Cash velocity - is one of the activity ratios that measures how effectively a particular company is using its resources. It indicates the number of times cash has been turned over during the year. Technically, high cash velocity indicates effectively usage of cash resources. But if the liquidity ratios are weak, then high cash velocity may be an indication of liquidity problems faced by the company.
6. Sales to total assets
7. Sales growth
8. Average collection period
9. Fixed assets turnover
10. Interest earned
11. Inventory turnover
12. Inventory to net working capital

The linkage between credit risk and the above mentioned ratios may be described as a diagram:

Figure 1.
The Trend Curves of Important Ratios That Can Serve as Prognosticators of Default



(Dimitris N. Chorafas, 2000)

Today, there are available some good models for credit risk. Examples of algorithms for marking-to-model counterparty risk are provided by Credit Metrics, by J. P. Morgan; the Actuarial Credit Risk Accounting (ACRA), by Credit Swiss and Loan Accounting System (LAS), by KPMG, etc.

Risk Adjusted Return on Capital (RAROC), developed in the late 1980s by Bankers Trust, has been the first to apply marking-to-model procedures to credit risk. The newest one is RiskCalc by Moody's Investors Service. This model supports a rating methodology for private companies based on power curves as predictors of default. It is primarily addressing middle-market lending, which is still a largely subjective process in search of analysts. The concept of power curves rests on Pareto's law, statistical inference and database mining. Rich databases enhance the predictive potential of models. RiskCalc incorporates critical factors that help in the existence and financial safety of a company or, alternatively, can tell us how well (or how badly) a given organization manages its business. Examples are: Level of leverage, Profitability, Liquidity, Inventories and Sales growth. Ratios, except inventories, are entered in the "RiskCalc", the program for Private Companies by Moody's Investors Service. Moody's uses RiskCalc as a rating methodology. As a conclusion from the expertise, the critical Ratios entering into a prognosticator of Default are: Leverage, Profitability, Cash Velocity, Liquidity and Inventories. Many financial studies in accounting, finance, and strategic management have directly or indirectly used and analyzed various firm risk procedures. Likewise, financial studies of the banking industry also use and examine risk at individual level.

Miller and Bromiley (1990) performed analysis on various firm risk procedures by conducting a factor analysis to categorize risk procedures and also to compare differences in risk impacts between high and low performers. Their study identified three wide-ranging risk factors: income uncertainty, stock returns risk and strategic risk. On a firm's future performance, the income uncertainty has a negative impact, the strategic risk has mixed impact and there is no impact for stock returns risk according to the results of the research. The authors were addressed to all industries in general, not on a particular industry and this will help us to future apply the findings to the banking credit risk analysis. In addition, Bromiley (1991) developed a causal model between risk and performance, taking into consideration issues relating to innovation, speaking about the performance of the firm and of the industry in which it operates.

2.2 Risk procedures

Following Miller and Bromiley, bankruptcy risk, beta, unsystematic risk, book-to-market-equity ratio and debt-to-equity ratio are represented through the series of financial firm risk procedures including variations of three financial ratios of return on asset (ROA), return on equity (ROE), and earnings per share (EPS), three different Ohlson's O scores. Accordingly, financial risk procedures categorize into four different measurement groups: (a) performance risk procedures, (b) bankruptcy risk procedures, (c) stock performance risk procedures, and (d) strategic risk procedures.

a) Performance Risk Procedures

ROA, ROE, and EPS are firm performance indicators and combinations of these three ratios have had application as risk procedures (Bowman, 1980, 1982; Fiegenbaum & Thomas, 1985, 1986, 1988; Miller & Bromiley, 1990). Companies with high or diminished variations of these ratios are considered more (or less) risky. To estimate these three risk procedures, Miller and Bromiley, in their studies, use data for the past 5 years; standard deviations for the three ratios in the past 20 quarters (5 years) become proxies for the three risk procedures. Recent research on risk-return shows that organizational decisions, risk, and performance are very much related. According to Fiegenbaum; Thomas (2004), the advent of the outlook theory provided a method for explaining why companies with problems may assume risks when their performance is below a reference point, while successful companies may aspire high returns at a relatively low risk. When speaking of attitude with regard to risk, Fiegenbaum; Thomas (1988) reported by means of research performed to detect the risk-return relation in 60 companies during 1960-1979, that there was a negative association between risk and return for companies below a desired performance level, while there was a positive association between risk and return for companies above the desired level. While extending this research to detect risk assumption, Bromiley (1991) concluded not only that poor performance seems to increase risk assumption, but also that this risk assumption ends up in poorer still future performance. This relation was examined by Wiseman; Bromiley (1996), who concluded that these companies increase risk owing to a deterioration of their outlook, and this risk which they consider a "bad risk" may reduce even more their performance.

b) Bankruptcy Risk Procedures

Corporate bankruptcy prediction has been a popular area of research since late 1960s. This area of research has relied on accounting measures such as profitability, cash flow and leverage ratios as predictor variables. Of the early studies, Altman (1968) has become the most influential. He developed a Z-Score based on five variables that had the highest predictive power. The next generation of default series employed multinomial choice-based techniques. Ohlson's (1980) one-year prediction model has been widely referred and used. Ohlson developed a bankruptcy score, (the so called "Ohlson's O score"), which uses several fixed-coefficient variables to establish estimates. Since its initial use, Begley, Ming, and Watts (1996) and Hillegeist, Keating, Cram, and Lundstedt (2004) have examined Ohlson's O score widely and they established updated variable coefficients for estimating the score. Ohlson is believed to be the first to develop a model using Multiple Logistic Regression (Logit) to construct a probabilistic bankruptcy model in predicting bankruptcy. The O-score model has nine variables that belong to three main categories: size (book value), leverage and profitability; a high probability of default is associated with low average returns of the model. The model for Ohlson's O score is:

α_{0-9} = estimated coefficients from each study of Ohlson (1980), Begley et al. (1996), and Hillegeist et al. (2004)

Size = $\ln(\text{total assets}/\text{GDP price level index})$;

TL/TA = total liabilities divided by total assets;

WC/TA = working capital divided by total assets;

CL/CA = current liabilities divided by current assets;

NI/TA = net income divided by total assets;

FFO/TL = pre-tax income plus depreciation and amortization divided by total liabilities;

INTWO = an indicator variable equal to 1 if cumulative net income in the previous 2 years is negative and 0 otherwise;

OENEG = an indicator variable equal to 1 if owners' equity is negative and 0 otherwise;

CHIN = $(NI_t - NI_{t-1}) / (NI_t + NI_{t-1})$; the scaled change in net income, and t represents a time period.

$$\begin{aligned} \text{Ohlson's O score} = & \alpha_0 + \alpha_1 \text{Size} + \alpha_2 \frac{TL}{TA} + \alpha_3 \frac{WC}{TA} + \alpha_4 \frac{CL}{CA} + \\ & + \alpha_5 \frac{NI}{TA} + \alpha_6 \frac{FFO}{TL} + \alpha_7 \text{INTWO} + \alpha_8 \text{OENEG} + \alpha_9 \text{CHIN} \end{aligned}$$

c) Stock Performance Risk Procedures

We present two risk procedures related to stock performance according to the capital asset pricing model (CAPM): beta and unsystematic risk. Initially, Sharpe (1964) introduced the idea of CAPM which had additional contributions to its development by Lintner and Black. The central idea of the model is that expected excess return positively and proportionally relates to beta (β), which represents systematic risk. The CAPM Equation is:

$$E(R) - R_f = \beta [E(R_m) - R_f],$$

where $E(R)$ = expected return on equity;

R_f = risk-free rate;

$E(R_m)$ = expected market return, and

β = systematic risk.

Beta determines the expected return, under the assumption that all investors are knowledgeable enough to invest in a diversified portfolio.

d) Strategic Risk Procedures

Jorion (2003) explains that risk may be defined as the “volatility of unexpected results, normally related to the value of assets or liabilities of interest. A risk is considered strategic and is related to the field of activity in which the company acts. A risk is voluntarily assumed with the purpose of creating a competitive advantage and of appreciating a company in the light of its competitors. Other risks over which a company has no control are known as non-strategic risks, such as changes in the economic or political scenario, the effects of wars, etc. Two additional risk procedures are book-to-market ratios and debt-to-equity. These ratios are strategic risks measures, according to Miller and Bromiley. Low (or high) book-to-market ratio can suggest that a company has a high (or low) growth opportunity or low (or high) risk. Calculating the debt-to-equity ratio for analysis occurs by dividing total book equity by the market value of the equity. According to Bromiley, a company shows organizational slack when it has funds in excess of its normal basic operating needs, without great changes. Nonetheless, this slack may occur in a situation of funds above the sufficient amount to provide it with the ability to react to changes in the environment in which it operates.

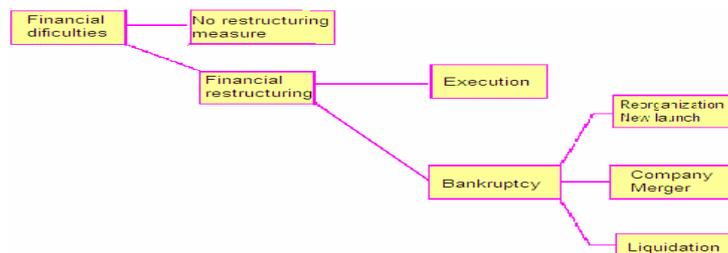
3 Relationship Company Risk and Performance

In an uncertain or risky environment, companies always deal with situations in which decisions need to be taken without their results being completely known. In the economic concept, perhaps the most common example is the choice of allocating wealth in different assets, as the objective is the search of an appropriate combination of liquidity and profitability attributes. Managers take decisions combining a concern with an improved corporate performance with the appetite for risk as expressed by

shareholders. This decision involves a choice between liquidity and maximum safety, such as the one provided by currency or choosing nonmonetary assets, whether or not financial, with less liquidity, greater risk, yet with a return expressed in the form of interest payments, dividends, profits, or that represented by the likelihood of market value appreciation. One of the central concepts in the literature employed is the idea that performance is a multi-dimensional construction. It is known that companies often sacrifice profitability in the name of growth, in order to speed up the development of new products. Similarly, efficiency may be sacrificed in the name of growth. Though it may seem clear that organizational performance is multi-dimensional and that effective performance in a dimension may represent a cost in connection with effective performance in another dimension, exactly how effective the different dimensions of organizational performance are or should be is an issue that creates considerable discussions. Two general perspectives explain the relationship between company risk and company's future performance (Kahneman and Tversky, 1979): an increase in risk increases the performance of the company's future because the company is in good financial condition and will make only the selected investments with high expected returns, implying a positive relationship. For a company with low performance, an increase in risk decreases the performance of the company's future because the company is in poor financial condition and has a limited ability to make only good investments, thus implying a negative relationship. This way, due to situations at a particular juncture or to hard deficiencies emerged in the mechanism of the enterprise; the companies can deal with temporary or permanent payment difficulties. In case of the existence of permanent payment difficulties of the obligations towards third parties, we can talk about an economical and financial fragility of the company, with negative influence regarding its solvency. The main problem encountered by the practice is choosing the moment when the insolvency procedure should begin, which should be neither too early, nor too late. If this moment will be settled too early, the company will not have the possibility to look for more simple solutions to straighten and will suffer irreparable image lost. Though, if the procedure begins too late, there is the possibility for the company not to have enough assets in order to partially or fully compensate its creditors.

Figure 2.

The solutions of a company with permanent pay difficulties



The necessity of reorganizing the economical activity derives more as the national economy is in the situation of recession, a phenomenon which highly affects the economical and financial balance. The threats that float at the level of the economical agents are directly dependent to the impact amplitude of the general frame and also to the adaptability grade of every single entity to the changes which can occur. The crisis identified at the level of the activity's branch which the company belongs to, most often leads to the deadliness or regression of the demands of services, and its dimensions are established according to the characteristics of each branch. This way, the failure of a business is different from one industry to another, and one can say that we can only improve the quality of the insolvency forecast patterns through careful research in every industry level.

4 Conclusions and implications

In the present economical context, the companies become more and more sophisticated, and the management of the indebtedness degree becomes a real challenge, because it is associated to the development of any business. The complexity of the business demands not only the progress of the main activities, but also a new dimension: the financial health of the companies. This way, the business risk of a company doesn't consist only of a credit risk, an interest rate risk or an exchange risk, but also of capital risk, operational risk and insurance risk or of the transnational risk, occurred due to the relations mother entity- branch. The present financial crisis is one more example that any business which is created with a high degree of indebtedness can be the most quantified from the standpoint of the real risk scale, only after the risk occurred. While assessing the performance of a business, we're looking for ways to measure the financial and economical consequences of past management decisions that shaped investments, operations, and financing over time. The important questions to be answered are whether all resources were used effectively, whether the profitability of the business met or even exceeded expectations, and whether financing choices were made carefully. More, as the world's equity markets have become increasingly integrated and since the different countries have tended to develop their reporting practices independently of one another, there is now a pressing need to bridge the international information gap. The search for a common, cross-border body of reporting rules and the co-ordination of practices, have both become issues of international concern.

M. Gervais, talks about a new fact in economy, "the control of the unpredictable". "You have to learn to control yourself in order to suit the unpredictable and to keep up with the activity on the straight line of the objectives." (Berea O.A, 2005). These facts become concrete into a modern method to identify "the strong points" and the "weak points" of the company, into reaching the promotion of the healthy, efficient, perspective phenomena, and the disproof of the negative aspects, or at least their decrease.

None of us can predict the future. However, careful analysis can yield insights into how a company may develop. The best way to understand a company's financial

health – the historical performance which provides some early insights is to project its future performance and develop a financing plan for a number of different scenarios.

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Risk assessment and control tools are suggested for each financial risk type, and real-world examples are used to illustrate the discussion. A case study of the financial risks and the financial risk management choices available to Pietrolunga, a fictitious specialist Italian lumber merchant, shows how the suggested methods may be applied in practice, and a glossary of key terms provides a quick source of reference. The control loop is closed when the effectiveness of the risk controls is evaluated through a reporting and review process. This then leads to a new risk identification and evaluation process. This process itself has three main components. These financial risks are not necessarily independent of each other. For instance, exchange rates and interest rates often are strongly linked, and this interdependence should be recognized when managers are designing risk management systems. The benefits of managing financial risks include the protection of cash flows and a reduction in earnings volatility. This can contribute to a lower cost of capital, and an increase in a company's ability to access financing and exploit other opportunities. Financial risks can be subdivided into distinct categories; a convenient classification is indicated. Financial risk management is the activity of monitoring financial risks and managing their impact. It is a sub-discipline of the wider task of managing risk and also a practical application of modern finance theories, models and methods. For instance, the key idea behind portfolio theory, the mean-variance framework is the main approach to assessing the aggregate risk in an organisation. To use the portfolio approach requires us to know the expected return on an asset, the asset's variance or standard deviation (that is, the dispersion from its expected return) and the correlation to other assets in the portfolio. We perform risk assessment procedures to obtain an understanding of the entity and its environment, including the entity's controls, to identify and assess the risks of material misstatement, whether due to error or fraud, at the financial statement and relevant assertion levels, which aids us in designing further audit procedures. The objective of this presentation is to provide an overview of the risk assessment process as it relates to the planning of the audit.

2. What is Risk Assessment?

Risk assessment is the identification and evaluation of several aspects of an entity whereby risks can be assessed by historical financial information of company, credit rating agency and decision makers. Hence, fuzziness and accuracy are existed simultaneously in the assessment information. In view of the above-mentioned review, a financial risk index system including quantitative and qualitative index needs to be researched. As studied in numerous risk evaluation researches, existing approaches used partial information. Wang and Liu [30] utilized crisp numbers to evaluate financing risk qualitatively. The proposed financial risk assessment model consists five parts, as depicted in S1 Fig. The first part is the establishment of financial risk index system, the important criteria as well as sub-criteria are determined from literature reviews and experts.