



Analysis of Financial Health of Selected Indian Companies

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Abstract

Financial ill-health is characterized by yields of bonds lower than the risk free interest rate and significant difficulties in obtaining additional external financing. Financial distress is seen as an intermediate state between solvency and insolvency. Financial distress leads to a loss of market share, damages customer confidence, can lead to large layoffs and cause conflicts with the firm's stakeholders. A company in financial distress has the choice to restructure its debt and reach an appropriate level of solvency, to merge and, thus, disappear as an independent business entity, or to file for bankruptcy as a strategic response by the management or owners to financial problems.

Financial distress is defined as an inability of the company to meet its current financial obligations. High leverage situation of enterprises constitute the core of the financial distress problem to predict the financial soundness of a business, financial ratios are a key indicator. Financial ratios are a tool to determine the operational & financial efficiency of business enterprises. Altman developed a z-score model using ratios as its foundation. With the help of the Z-Score model, Altman could predict financial efficiency/distress up to 2-3 years in advance. This research paper attempts to predict financial distress of selected Indian enterprises by using Altman's Z-Score revised model for the period of three years i.e. from 2019-20 to 2021-22.

Keywords: Business failure, bankruptcy, Altman's Z-score model, financial ratios

Introduction

Financial distress is defined as an inability of the company to meet its current financial obligations. High leverage situation of enterprises constitute the core of the financial distress problem. Financial distress is a very complex and versatile process. The development of the theory of financial distress as a process having specific dynamics began with an article by Gordon (1971) [5]. Gordon highlights that financial distress is only one state of the process, followed by failure and restructuring, and should be defined in terms of financial structure and security valuation. 24 The corporation enters this state when its power to generate earnings is becoming weak and the amount of debt exceeds the value of the company's total assets. Financial distress is characterized by yields of bonds lower than the risk free interest rate and significant difficulties in obtaining additional external financing. Financial distress is seen as an intermediate state between solvency and insolvency. Financial distress leads to a loss of market share, damages customer confidence, can lead to large layoffs and cause conflicts with the firm's stakeholders. A company in financial distress has the choice to restructure its debt and reach an appropriate level of solvency, to merge and, thus, disappear as an independent business entity, or to file for bankruptcy as a strategic response by the management or owners to financial problems. There are various types of bankruptcy prediction model as applicable in today's economic scenarios. Multiple discriminant analysis is the crux of this research paper. Dr Altman's model is discussed in detail describing the changes occurring to the equation so as to reach a perfect prediction model. Altman's revised Z-score model is one of the most

effective Multiple Discriminant Analysis, which has been researched throughout the last 40 years. Altman's Model has been used in various industries to predict bankruptcy. Researchers have used Altman's Z score model in the service industry, manufacturing industry, publically listed companies, and banks alike to predict if the business will have a downfall. All the 3 revision of Altman equation has been used by different authors in their studies, with constructive predictability. It can be safely said that Altman's Z score Model can be applied to modern economy to predict distress and bankruptcy one, two & three years in advance.

Literature Review

The development of the theory of financial distress as a process having specific dynamics began with an article by Gordon (1971) [5]. Altman (1997) studied the financial ratios of public companies which indicate corporate financial distress in the United States. Almeida and Philippon (2000) [8] analyzed risk adjusted cost of financial distress of public companies in the United States which have issued corporate bonds and have difficulties to pay coupon and its bond. Fitzpatrick (2004) [12] conducted empirical research on the dynamic of financial distress of public companies in the United States whereas Gennaiolla and Rossi (2006) explored the optimal solution of financial distress in Sweden. Outtecheva (2007) [17] analysed probability of financial distress risk and the way of avenues to avoid financial distress in NYSE. Chang (2008) [9] studied the corporate governance characteristics of financially distressed firms in Taiwan. Hui and Jhao(2008) explored the dynamics of financial distress of 193 companies which have experienced financial distress in

China during 2000-2006. Zulkarnian (2006) [21] analyzed the corporate financial distress among Malaysian listed firms during Asian financial crisis. Ugurlu and Hakan (2006) [20] conducted a research to predict corporate financial distress for the manufacturing companies listed in Istanbul stock exchange for the period, 1996-2003. Chiung-Ying Lee and Chia-Hua Chang (2010) [10] analyzed the financial health of public companies listed in Taiwanese stock exchange using Logistic Regression model of early warning prediction. There are also a number of careful research studies using data from United States firms that provide various methods to identify failing firms. After the establishment of Altman's Z score model, abundant studies have done further research on the z score model, including Deakin (1972) [11], Taffler (1983) [19], Goudie (1987), Agarwal and Taffler (2007) [7], Sandin and Porporato (2007) [18]. Many studies also have been done relevant to the Ohlson model, including Lau (1987) [16], Muller, Steyn-Bruwer, and Hamman (2009).

Altman's Z score Model

The Z scores, developed by Professor Edward I. Altman, is perhaps the most widely recognized and applied model for predicting financial distress (Bemmann, 2005). Altman (1968) [1] collected data from 33 bankruptcies and 33 non-bankruptcies, during the period 1946-1965, to find discriminating variables for bankruptcy prediction. In his seminal paper, Altman evaluated 22 potentially significant variables of the 66 firms by using multiple discriminant analysis to build the discriminant function with five variables. This model was later modified to a Altman model (1993) that uses the same variables multiplied by different factors.

If Public Firms,

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$$

If Private Firms,

$$Z = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5$$

If Non-Manufacturing Firms,

$$Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Where,

T₁ = Working Capital/Total Assets

T₂ = Retained Earnings/Total Assets

T₃ = Earnings Before Interest and Taxes/Total Assets

T₄ = Market Value of Equity/Total Liabilities

T₅ = Net Sales/Total Assets

Z= Overall index of Bankruptcy. When using this model, Altman concluded that: Z score < 1.81 = High probability of bankruptcy, Z score > 3 = Low probability of bankruptcy, Z score = In between 1.81 and 3.0 = Indeterminate.

A score of Z less than 2.675 indicates that a firm has a 95% chance of becoming bankrupt within one year. However, Altman result shows that in practice, scores between 1.81 to 2.99 should be thought of as a grey area. Firms, with Z scores within this range, are considered uncertain about credit risk and considered marginal cases to be watched with attention. Firms with Z scores below 1.81 indicate failed firm, Z score above 2.99 indicates non-bankruptcy. Altman shows that bankrupt firms have very peculiar financial profiles one year before bankruptcy. These different financial profiles are the key intuition behind Z score model. Eidleman (1995) defines

each of the above ratios as follows: X1 is a liquidity ratio, the purpose of which is to measure the liquidity of the assets 'in relation to firm's size'. It is the measure of net liquid asset of a concern to the total capitalization which measures the firms ability to meet its maturing short-term obligations. X2 is an indicator of the 'cumulative profitability' of the firm over time which indicates the efficiency of the management in manufacturing, sales, administration and other activities. X3 is a measure of firm's productivity which is crucial for the long-term survival of the company. It is a measure of productivity of an asset employed in an enterprise. The ultimate existence of an enterprise is based on earning power. It measures how effectively a firm is using its resources. It measures the managements overall effectiveness as shown by the returns generated on sales and investment. X4 defines how the market views the company. The assumption is that with information being transmitted to the market on a constant basis, the market is able to determine the worth of the company. This is then compared to firm's debt. It is reciprocal of familiar debt equity ratio. Equity is measured by the combined market value of all shares, while debt includes both current and long term liabilities. This measure shows how much of an asset can decline in values before liabilities exceed the assets and the concerns become insolvent. It measures the extent to which the firm has been financed by debt. Creditors look to the equity to provide the margin of safety, but by raising fund through debt, owners gain the benefit of marinating control of the firm with limited investment. X5 is defined as a 'measure of management ability to compete'. The capital turnover ratio is the standard financial measure for illustrating the sales generating capacity of the assets.

Objectives

To analyze financial distressed or non-distressed companies out of selected sample Indian companies.

Hypotheses

H₀: There is no significant difference in means of distressed and non-distressed companies.

Methodology

Collection of Data

In order to test the credit risk of selected enterprises, Altman's Z score model is used which is based on secondary data. The data from the published sources is the basis for analysis i.e. National stock exchange, Bombay Stock exchange and selected companies auditor reports.

Sample

- i) Jet Airways (India) Ltd
- ii) GTL Infrastructure Ltd
- iii) GMR Infrastructure Ltd
- iv) Exelon Infrastructure Ltd
- v) Hindustan Motors Ltd
- vi) Adani Ports and SEZ Ltd
- vii) Essar Ports Ltd
- viii) Lanco Infratech Ltd
- ix) Maruti Suzuki India Ltd
- x) Hero Motorcrop Ltd.

Table 1: Table Showing calculated Z-score

Calculated Z-Score					
Companies	2012-13	2012-11	2010-11		Average
Jet Airways (India) Ltd	-1.3489	-0.6414	0.7025	Low Range	-0.4293
GTL Infrastructure Ltd	0.3766	-2	-1	Low Range	-0.6211
GMR Infrastructure Ltd	1.936	1.6602	1.7434	Low Range	1.77987
Exelon Infrastructure Ltd	N.A	N.A	15.7016	High Range	15.7016
Hindustan Motors Ltd	8.8131	2.7448	4.1588	High Range	5.2389
Adani Ports and SEZ Ltd	3.4946	1.4583	2.8592	Medium Range	2.60403
Essar Ports Ltd	1.0799	1.8523	2.3315	Low Range	1.75457
Lanco Infratech Ltd	0.2212	0.3906	2.2629	Low Range	0.95823
Maruti Suzuki India Ltd	4.6317	4.4511	7.5918	High Range	5.5582
Hero Motorcrop Ltd	6.9455	6.7429	5.7238	High Range	6.47073

As shown above collected and compiled data, it is analyzed that Z score of Jet Airways (India) Ltd, GTL Infra Ltd, GMR Infra Ltd Essar Ports Ltd and Lanco Infra Ltd is less than 1.80 in all three years. These companies are financial distressed. These companies are highly vulnerable to bankruptcy. Companies need to analyze the weak zones and take necessary steps to avoid the same. Z-score of Adani Ports and SEZ Ltd indicates that company is out of crisis zone, it is mandatory to take precautionary steps and keep tab of the figures to avoid bankruptcy, as z-score is between 1.80 and 3.0. Exelon Infra Ltd, Hindustan Motors Ltd, Maruti Suzuki India Ltd and Hero Motorcrop Ltd are financially sound, as Z score of these companies is more than 3.0. Companies are in a stable condition and the chance of bankruptcy is Nil with the current Z values

Table 2: Table showing the F test

S. No.	Distressed	Non distressed
1	-0.43	15.70
2	-0.62	5.24
3	1.78	2.60
4	1.75	5.56
5	0.96	6.47
Calculated F test		0.01490514
Table Value		6.39

Above calculation indicates that there is no difference between means of distressed companies and non-distressed companies, as calculated F value (0.0149) is less than Table value of F (6.39).

Interest coverage ratio of financial distressed companies is low shown in above table. Companies facing financial distress usually experiences a decline in profitability, is overleveraged or have insufficient cash flows to cover current obligations. This ratio expressed as earnings before interest and taxes, divided by interest expenditure is less than 1 for many companies. This typically means that the company is not generating adequate cash flow to meet its interest payments Higher the ratio, higher the profitability. The ideal ratio should be 6 to 7 times. While ratio of financial sound companies is high as capable of paying interest charges i.e. fixed cost, except Hindustan Motors Ltd. Ideal debt equity ratio is 2. Above data refers financial distressed companies are highly debt trapped.

Findings: Z-score distress prediction model will surely provide an insight to expose the corporate managers to tackle

challenges ahead. On the other hand, lenders having better knowledge regarding the factors affecting corporate distress and bankruptcy can determine firm specific risks as well as can evaluate firms' financial positions more assertively.

Suggestion: The companies under financial stress due to circumstances beyond their control, such as slowdown or delays in project execution are offered a way out via the corporate debt restructuring route.

Limitation of Study: Study is confined to a very limited period comprising only 3 years from 2019-20 to 2021-22.

1. Sample selected for study is randomly selected ten companies.
2. Data is collected from secondary source.

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