

A Study on Bankruptcy Using Altman Z-Score Prediction Model

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Abstract

The main objective of this study is to foresee the bankruptcy position of the company SME by using the model Altman Z-Score. The Altman Z-Score is an empirical model which predicts the corporate insolvency; The financial health of the organisation can be studied, by this tool particularly about the liquidity position of the companies. The present research paper focuses on four financial ratio's indicators of Altman Z-score in order to predict or ascertain the financial distress and the bankruptcy position of the company. The ratio's indicators include Working capital to Total Assets, Retained Earnings to Total Assets, Earnings before income and tax to Total Assets and Book value of equity to Total Liabilities.

In this research paper, the bankruptcy prediction model of Altman is used for SME. Five consecutive years from FY2013 – 2014 to FY2017 – 2018 were taken into consideration for the analysis it has been observed that the bankruptcy position of the company, indicated "Grey Zone" for all the five years i.e. from the year 2013 – 2014 to 2017 – 2018 which is a caution zone means the company may or may not go into bankruptcy. Therefore appropriate measures should be taken up by the company to manage its resources properly and concentrate on the financial health to compete in the market.

INTRODUCTION

Financial health a company or a firm places a pivotal role in every organization in the world. To be healthy firm and wants to continue its operation in long run it needs adequate funds to meet both the short term and long term obligations of the business.

FINANCIAL DISTRESS OR INSOLVENCY

Financial distress or insolvency of a company refers to a condition in which a company cannot meet, or has difficulty paying off, its financial obligations to its creditor, typically due to high fixed costs, liquid assets, or revenues sensitive to economic downturns. In other terms financial distress or insolvency of a company is a stage before bankruptcy where company's creditors are not being paid or are paid with significant difficulty. For the organization it is difficult from coming out of the distress zone or bankruptcy. More costs can be incurred under financial distress by the company related to the situation, such as expensive financing, opportunity cost of projects, and less productive and efficient employees. In a financial distress, Employees usually have lower morale and higher stress caused due to increased chances of bankruptcy, makes the employees quit their jobs.

LITERATURE REVIEW

Many research works are undertaken by researchers around the world to analysis the corporate failure for predicting bankruptcy of the companies. Beaver (1966) used financial ratios and he was the one who first initiated and started using the ratios to predict corporate sickness. He used 30 financial ratios and selected 79 non-failed and 79 failed firms for his study and concluded that cash flow to total debts ratio is the best business failure predictor.

Edward I Altman (1968), a New York University Professor carried out research for predicting bankruptcy. For his research professor took 33 failed and 33 non-failed companies as sample. He developed Z score model, which is based on "Multiple Discriminate Analysis" (MDA), is used in prediction of bankruptcy of a company. The result of his study showed that bankruptcy prediction could be correctly made with 95% success in the first year before the bankruptcy, it decreased to 72% in the second year, 48% in third year, 26% in fourth year and 19% in fifth year prior to bankruptcy.

L.C. Gupta (1979), in Indian Scenario, attempted to analyse the corporate sickness, so he had selected 41 textile companies (out of which 20 sick and 21 non-sick) and 39 non-textile companies (out of which 18 sick and 21 non-sick) as sample. He used different financial ratios to evaluate the performance of the sample companies. Johah Aiyabei (2002) used Z score model to study the financial health of small business concerns of Kenya and pointed out the theoretical aspects of distressed firms.

Altman Bankruptcy criterion

Discrimination		
Safe Zone	$Z > 2.6$	Indicates good financial health of a company
Grey Zone	$2.6 < Z < 1.1$	Uncertain results. The probability that company is bankrupt or not.
Distress Zone	$Z < 1.1$	Probability occurrence bankruptcy and high risk.

OBJECTIVE OF THE STUDY

- To examine the financial distress and bankruptcy of VAMA Infrastructure Private Ltd using Z-Score.

Bankruptcy has become one of the most critical issues in the corporate finance world today. As it refers to the financial health or stability of business entities. The significance of bankruptcy or financial distress was extremely felt during the financial crisis(Taffler, 1983). Shareholders have since then gained interest regarding the level of reliability of companies that are important to them before investing in corporations. So, credit and default rate of companies are of great importance to them before they invest in them

METHODOLOGY OF THE STUDY

The data for the research has been collected mainly from the secondary data comprising the balance sheets, bulletins and manuals of the VAMA INFRASTRUCTURE Company and text books, magazines and journals. Five year balance sheets i.e. from 2013 to 2018 have been considered for the study. Some amount of primary data is also collected from the company executives and employees.

DATA ANALYSIS

Table 1::X1, Working Capital/Total Assets (WC/TA)

Year	Working Capital	Total Assets	$X1=WA/TA$	$6.65(X1)$
2013-2014	1999600	61653667	0.032432783	0.212759056
2014-2015	3108703	58593494	0.530541204	0.348843619
2015-2016	3875576	44749851	0.008660534	0.568131021
2016-2017	6258447	62279340	0.100489938	0.659171091
2017-2018	8411928	78234878	0.107521456	0.705340751

Table 2::X2, Retained Earnings/Total Assets (RE/TA)

Year	Retained Earnings	Total Assets	$X2=RE/TA$	$3.26(X2)$
2013-2014	8132278	61653667	0.13190258	0.4300024
2014-2015	9260022	58593494	0.15838399	0.5152052
2015-2016	10722438	44749851	0.23960835	0.7811232
2016-2017	12349666	62279340	0.19829475	0.6164407
2017-2018	12795418	78234878	0.16355133	0.5331772

Table3:X3, Earnings Before Interest and Taxes/Total Assets (EBIT/TA)

Year	EBIT	Total Assets	$X3=EBIT/TA$	$6.72(X3)$
2013-2014	9149705	61653667	0.202429126	1.36032373
2014-2015	1769936	58593494	0.03020704	0.20299131
2015-2016	2145746	44749851	0.047949791	0.32222595
2016-2017	2355050	62279340	0.037814306	0.25411213
2017-2018	779614	78234878	0.009965044	0.0669651

Table 4: X4, Book value of Equity/ Total Liabilities (BVE/TL)

Year	Book Value of Equity	Total liabilities	$X4=B.V. \text{ of Equity/TL}$	$1.05*(X4)$
2013-2014	13132278	48521389	0.270649259	0.284182
2014-2015	14260022	44333472	0.321653626	0.337736
2015-2016	15722438	29027413	0.541641034	0.568723
2016-2017	17349666	44929674	0.386151611	0.405452
2017-2018	17795418	60439460	0.294433769	0.309155

Table 5: Calculation of Total value of Z-score

Altman Z-score is an empirical model that predicts the probability of corporate insolvency. It is a financial tool through which the company’s financial performance can be analysed, particularly about the liquidity position of the companies. It is also called as predictor of financial distress. The five ratios to develop a z-score model is used. The variables are classified into five standard ratios which include Profitability, Leverage, Solvency and Activity and these ratios are systematically weighted.

$$Z\text{-score} = 6.568X1 + 3.26 * X2 + 6.72 * X3 + 1.05 * X4$$

CONSEQUENCES

- $Z' > 2.60$ – “Safe” Zone. If Z-Score is greater than 2.60 the company is free from bankruptcy.
- $1.1 < Z' < 2.60$ – “Grey” Zone. If Z-Score is between 1.1 and 2.60 it indicates that there is possibility of the company may or may not go into bankruptcy.
- $Z' < 1.1$ – “Distress” Zone. If Z-Score is less than 1.1 is viewed as Distress Zone i.e. the possibility of companies bankruptcy position is high.

Table 5: Calculation of Z-Score.

Working notes

$$Z\text{-score} = 6.568X1 + 3.26 * X2 + 6.72 * X3 + 1.05 * X4$$

(2013 – 2014)

$$2.28726693 = 0.212759 + 0.430002 + 1.360324 + 0.284182$$

(2014 – 2015)

$$1.404776414 = 0.348843619 + 0.515205182 + 0.202991307 + 0.337736307$$

(2015 – 2016)

$$2.240203282 = 0.568131 + 0.781123 + 0.322226 + 0.56872309$$

(2016 – 2017)

$$1.935175863 = 0.659171091 + 0.616440722 + 0.254112134 + 0.405451916$$

(2017 – 2018)

$$1.614638542 = 0.705340751 + 0.533177238 + 0.066965095 + 0.309155457$$

Table 5: Calculation of Total value of Z-score

Year	X1	X2	X3	X4	Zscore(X1+X2+X3+X4)	Discrimination
2013-2014	0.212759	0.430002	1.360324	0.28418172	2.28726693	Grey
2014-2015	0.348844	0.515205	0.202991	0.33773631	1.404776414	Grey
2015-2016	0.568131	0.781123	0.322226	0.56872309	2.240203282	Grey
2016-2017	0.659171	0.616441	0.254112	0.40545192	1.935175863	Grey
2017-2018	0.705341	0.533177	0.066965	0.30915546	1.614638542	Grey

FINIDINGS

The Impact is positive on liquidity position of the company on overall assets from 2013-2018 (0.212759056 to 0.705340751) which is because that the company has reduced its borrowings and increased in its current assets. The company maintained good amount of reserves and surplus for paying for the assets which is depicted from earnings ratio (2013– 2017). The company used its debts instead of profits for financing its assets from 2016-2018 and consequently the reserves declined.. EBIT to Total Assets Ratio observed that the ratio is fluctuating during the beginning of the years and from the year 2015 – 2016 to 2017 – 2018 the ratio is continuously declining from 0.32222595 to 0.066965095 because of fluctuation in sales revenue of the company and increased operating cost. Book value of equity to Total Liabilities ratio observed that the ratios are increasing from the year 2013 – 2014 to 2015 – 2016 which means the company is maintaining its assets

properly and decreasing its liabilities. From the year 2016 – 2017 to 2017 – 2018 the ratios has been decreased because the company has increased its liabilities. The overall Z-score of the company indicating “Grey Zone” from the year 2013- 2014 to 2017 – 2018 it means that there are chances for the company may get into bankruptcy position.

CONCLUSION

The blood of the organisation ie working capital to total assets ratio is increasing in a slower rate so the company need to focus on to increasing its working capital in a greater rate to meets its shorter obligations easily. By observing its current assets it has been found that the current investments and trade receivables are decreasing, so it need to take appropriate measures to increase it in order to have a efficient management of working capital.

Retained earnings to total assets ratio is been decreasing therefore it is suggested for the company to increase its earnings and maintain adequate reserves in order to pay for its expenses. The companies EBIT ratio has been decreased due to increasing operating cost and fluctuations in revenue rate, so it is suggested to decrease its operating cost in order to have efficient management of cost to yield high so that the company have long term viability. By observing the Z-score model for prediction of bankruptcy resulted in “Grey Zone” which means the company so almost near bankruptcy. So therefore it is suggested for the company to take appropriate measures to not to involved in bankruptcy position by managing the resources properly.

REFERENCES

1. Altman E .I " Financial Ratio Discriminant analysis and prediction of bankruptcy .The journal of finance sept. 1981 pp 589-609
2. Beaver, W. (1966). Financial Ratios as Predictors of Failure. Journal of Accounting Research, 4, 71-111.
3. L.C. Gupta published by the Industrial Credit and Investment Corporation of India Ltd, Bombay 1979