

Financial Health Analysis Using Altman's Z Score – A Comparative Study of Select steel companies**Syed Jaffer¹ Research Scholar, (Reg No: PP.MAN 301) Rayalaseema University, Kurnool, AP****Dr Badiuddin Ahmed¹ Head & Professor, Dept of Commerce, MANUU, Hyderabad.****Abstract**

The financial health plays a significant role in the successful functioning of a firm. Stockholders, Managers, Creditors and employees of the business are always concerned about financial health of the companies. Poor financial health threatens the very survival of the firm and leads to business failures. Measuring the financial health of a company is extremely important for both managers as well as investors. Several tools have been developed to diagnose the financial strength of a company based on the Financial Statements. Ratio Analysis, and Decision Theory etc., but they indicate the present results not the future. Edward I. Altman's Z score model which employs a combination of various ratios to form an index of liquidity, profitability, sustainability and feasibility, has been highly accurate in analyzing the financial health of a company at present state and as well as to enable one to predict the future also, particularly in terms of probability of bankruptcy. It is an important tool that predicts the financial health of companies and categorizes them in three zones – 'safe', 'grey' and 'distress'. In Recent time, Steel industries have been showing good performance and producing large amount of steel. This paper attempts to investigate the financial health of select steel companies in India with special reference to Tata Steel Ltd., and Steel Authority of India Limited. It can be concluded from the study that both the companies are in distress zone.

Key Words: Altman, Financial health, Bankruptcy, Liquidity, stakeholders.

Introduction

The financial health plays a significant role in the successful functioning of a firm. Poor financial health threatens the very survival of the firm and leads to business failures. With the recent global financial crisis and the failure of many organizations in the U.S and the European countries it has become all the more necessary that the stakeholders study the financial health of their organization. Utilizing the tools of common financial analysis, small business owners and entrepreneurs are empowered to make the right decisions, safeguard themselves against market fluctuations, train their workforce, and accurately budget for the future to ensure their long-term viability. Corporate profitability has eroded sharply while debt burden has increased. Corporate failures are a common problem of developing and developed economies. Failure is not an impulsive outcome and it grows constantly in stages. There are unique characteristics of failure in firm's financial levels prior to reaching the levels of total failures. A protective effort could be made effectively if the company is foreseen to be proceeding in the direction of potential bankruptcy and this can help the company and the stakeholders from facing the painful consequences of a complete failure. The turbulent and the competitive scenario in the corporate sector has made it imperative for the stakeholders to assess the financial health of the companies. If the company is not in a good financial health it may not be able to survive in the future. Companies failures negatively affect stakeholders including stockholders, creditors, customers, suppliers and employees. If the stakeholders

know that a bankruptcy may occur in the near two years and so ,they will be better prepared to protect their interests.

In cases of manufacturing firms, continuous monitoring of the financial health is still more important, given the higher proportion of funds tied up in real assets. Edward I. Altman's discriminant analysis, which employs a combination of various ratios to form an index of liquidity, profitability, sustainability and feasibility, has been highly accurate in analyzing the financial health of a firm at present state and as well as to enable one to predict the future also, particularly in terms of probability of bankruptcy. In Recent time, Steel industries have been showing good performance and are producing large amount of steel. India is the world's third-largest steel producer in 2016. The growth in the Indian steel sector has been driven by domestic availability of raw materials such as iron ore and cost-effective labour. Consequently, the steel sector has been a major contributor to India's manufacturing output. The core aim of this paper is to predict the financial health/strength/soundness of the firm by adopting Altman's Z – Score in the selected firms from the Indian Steel industry .This study is purely based on published secondary data through websites, annual reports and published journals.

Review of Literature

A lot of research has gone into studying and analyzing the financial health of companies by accountants and researchers all over the world. Accounting ratios have been widely used in development of models for predicting financial health and financial distress of companies. Researchers have been trying to find a ratio that would serve as the sole predictor of corporate health and bankruptcy for a long time. In the year 1968, Edward Altman[1] used multiple discriminant analysis (MDA) to built a bankruptcy prediction model. Altman made use of five ratios to develop a Z Score which helped in the prediction of the financial health of a company. Altman found that his five ratios outperformed Beaver's (1966) cash flow to total debt ratio. His study was based on 60 firms in general. Ambika & Sengottaiyan (2015) [2] in their article on "Financial Health Of Selected Fertilizer Companies In India - A Z - Model Approach" made an attempt to know financial health and efficiency of the company using data collected for the period of 1999-2012 from secondary sources. Using statistical tool like mean, Z-score of selected 6 companies from public sector and 8 companies from private sectors, revealed that SPICL has sound financial performance during the period. Kannadhasan (2015) made an attempt to evaluate and predict financial health of company using z-score model. The data is collected from secondary sources for the period 2000-05. He has found that the company's overall financial performance is found to be good during the study period. Selvi & Dheenadhayalan (2014) conducted a study with the objective to measure financial health of selected 7 bulk drugs and formulation companies in India through z-score model. The data is collected from the secondary sources like journal, annual reports for the period 2000-2012. They have concluded that z-score of Cipla Ltd has been increased during the period. Rooh Ollah Arab & Georgee (2014) made an attempt to evaluate financial strength of selected 5 sample companies of steel sector in India. The data is collected from the secondary sources for the period 2003-2013. They has concluded that for short term solvency only quick ratio andfor long term solvencyall ratios found to be satisfactory. Sinkuand Kumar (2014) conducted a study aim to measure and predict the financial health and efficiency of SAIL through Z-Score model during 2005 to 2010 and found that overall health of SAIL is good. Shrabanti Pal (2013) have made an attempt to analyses the financial health, areas of weakness, suggestion for improvements for selected two public companies like Steel Authority of India Limited and Rastriya Ispat Nigam Limited. He found that overall liquidity performance of SAIL and RINL is good for both companies. Dr. Bhayani (2004) has conducted study on working capital and profitability of cement industry and found that profitability is highly influenced by working capital.

ALTMAN'S Z-SCORE MODEL

Edward Altman Finance Professor of the Leonard N. Stern School of Business of New York University has developed the Financial Model in 1967 to predict the likelihood of bankruptcy of the company which is named as Altman's Z-Score Model. Later, in 2012 he released an updated version called the Altman's Z-Score plus Model that can be used to evaluate both manufacturing & non-manufacturing firms & public & private companies in both U.S & non-U.S companies. The investors can use this model to determine the financial health of these companies or any other companies to evaluate their financial health.

THE ORIGINAL Z-SCORE FORMULA FOR MANUFACTURING FIRMS

X1 = Working Capital / Total Assets

X2 = Retained Earnings / Total Assets

X3 = Earnings Before Interest and Taxes / Total Assets

X4 = Market Value of Equity / Total Liabilities

X5 = Sales / Total Assets

X1-Working Capital/Total Assets

The Working capital/Total assets ratio, is a measure of the net liquid assets of the firm relative to the total assets. Working capital is defined as the difference between current assets and current liabilities. Liquidity and size characteristics are explicitly considered. Ordinarily, a firm experiencing consistent operating losses will have shrinking current assets in relation to total assets.

X2-Retained Earnings/Total Assets

This measure is the cumulative profitability over time. The age of a firm is implicitly considered in this ratio. For example, a relatively young firm will probably show a low RE/TA ratio because its new and has not had enough time to build up its cumulative profits. Therefore, it can be said that the new firm is discriminated here against the old firms in the analysis, and its chance of being classified as bankrupt is relatively higher than another, older firm. But, this is precisely the situation in the real world. The incidence of failure is much higher in a firm's earlier time.

X3-Earnings before Interest and Taxes/Total Assets

This ratio is calculated by dividing the total assets of a firm with its earnings before interest and tax reductions. In essence, it is a measure of the true productivity of the firm's assets, abstracting from any tax or leverage factors. Since a firm's ultimate existence is based on the earning power of its assets, this ratio appears to be particularly appropriate for studies dealing with corporate failure. Furthermore, insolvency in a bankruptcy sense occurs when the total liabilities exceed a fair valuation of the firm's assets with value determined by the earning power of the assets.

X4-Market Value of Equity/Book Value of Total Debt

Equity is measured by the combined market value of all shares of stock, preferred and common, while debt includes both current and long-term. The measure shows how much the firm's assets can decline in value (measured by market value of equity plus debt) before the liabilities exceed the assets and the firm becomes insolvent. This ratio adds a market value dimension which other failure studies didn't considered. It is also a more effective predictor of bankruptcy than a similar, more commonly used ratio: Net worth/Total debt (book values).

X5-Sales/Total Assets

The capital-turnover ratio is standard financial ratio illustrating the sales generating ability of the firm's assets. It is one measure of management's capability in dealing with competitive conditions. This final ratio is quite important because, it is the least significant ratio on an individual basis. In fact, based on the statistical significance measure, it would not have used at all. However, because of its unique relationship to other variables in the model, the Sales/Total assets ratio ranks second in its contribution to the overall discriminating ability of the model.

Z score bankruptcy model:

$$Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + .999X5$$

The Z-Score, which as aforementioned is a survival indicator, classifies companies based on their solvency. The higher the value is, the lower the risk of bankruptcy. A low or negative Z-Score indicates high likelihood of bankruptcy. Altman set critical values between companies based on the survivability indicator which is given in table-1 as under:

Table 1. Critical values of Altman’s Model.

Z- Score	Zone	Predictive Status
Z > 2.99	“Safe” Zone (Too Healthy)	No or Little Chances of Failure
1.81 < Z < 2.99	“Grey” Zone (Healthy)	Uncertain to Predict
Z < 1.81	“Distress” Zone (Not Healthy)	Failure is Certain

As per Altman, the prediction accuracy of the model tapers off for longer prediction horizons such as four- and five-year horizons. Accuracy tapers from 95 % for 1-year and 72 % for 2-year prediction horizon, to 48 % for 3-year, 29 % for 4-year and 36 % for 5-year horizon.

Objectives of the Study:

1. To examine the financial health of sample units through Altman Model.
2. To forecast financial health of sample units.

METHODOLOGY

Two companies one from the public sector and another from private sector on the basis of production has been selected for the study. The study uses secondary data sources , annual reports etc are collected from the websites of respective organizations. The time frame of data collected is set for past 10 years i.e. from 2016 to 2006. A study of TEN years seems to be appropriate for Finding the Financial health. Study covers only two companies, i,e SAIL & TATA steel.

Hypothesis:

The sample units are equally sound with respect to financial health.

Statistical Techniques used:

Altman's Z score technique has been used to predict the financial stability of these companies.

DATA ANALYSIS AND INTERPRETATION:

The results of five financial ratios are employed in the Altman Z-score model to evaluate the financial health of the two companies-SAIL and TATA Steel.(See Table No 2)

The WC/TA is showing the negative trend for Tata Steel from 2006-07 onwards to 2015-16.It's almost a decade of negative results. This clearly indicates that the company is not in a good position to meet its short term obligations, and if the same trend continues it will be very difficult for the company to manage its current liabilities and is inviting the trouble of bankruptcy. SAIL on the other hand is having positive values which is good for the company, but at the same time if closely observed it is showing the decreasing trend from 0.605 to 0.034.

The RE/TA for Tata Steel , started to rise from 2009-10 onwards after global financial crisis and is improving whereas the SAIL is decreasing continuously year on year basis.

The EBIT/TA is progressing in tata steel from 2012-13 onwards ,whereas in case of SAIL it showing a decreasing trend from the year 2010-2011 onwards and for the current year it is negative. But on contrast the SAIL's performance is much better than Tata Steel in the beginning years of the study from 2006-07 to 2009-10.The two companies became victims of slow economic growth and low demand . High capital intensity was also a major drawback .This shows the profitability of tata steel is better than SAIL.

Tata Steels MVE/BVTD, is higher than SAIL in the initial years from 2006-07 to 2009-10 and from the year 2010-11 onwards there has been remarkable improvement in TATA Steel, SAIL's ratio's were higher from 2006-07onwards till 2010-11 after which there is a decreasing trend.

Tata Steel's S/TA ratio has been decreasing year-on-year from the 0.68 in 2006-07 to 0.31 in 2015-16.SAIL's performance is also showing the decreasing trend during the same period, but its ratio is much better than TATA Steel. This clearly indicates that assets failed to accelerate sales during the period. From 0.68 to 0.31 Tata Steel's ratio was the highest in the year 2006-07 and SAIL's Ratio was also highest at 1.48 in the same year.

If we closely analyse the performance of these two companies ,it can implied from the results that the steel industry in india is going through turbulent times because of import of steel from china and other levies levied on steel also effecting demand and supply. Another reason is global crisis in the year 2008 effected the steel industry and from then onwards it has struck it. Tata Steel is struggling from then and is in the grey zone with an average score of 2.36.this is an indication of Tata's financial meltdown. The century old company should try to dispose off the unproductive assets and pay-off their debts.

Sail in contrast is having good financial strength except in the last 5 years it's z score has moved into distress zone from healthy zone with an average z score of 3.59. The company has a low debt-equity ratio and large amounts of accumulated wealth in the form of retained earnings. After the financial crisis the z score of Sail also started falling and reached the grey zone in the year 2010-11.

Both the companies are showing similar trends in their performance and there financial health is deteriorating .There current ratio is below the standard and has to be improved .As per the Altman's Z

score Both the companies financial health is not good and they are moving from unable to predict to Failure zone.(See Table No 3)

FINDINGS

Table 2: Ratios Used In Altman Model for SAIL and TATA Steel

Year	X1=WC/TA		X2=RE/TA		X3=EBIT/TA		X4=MVE/BVTD		X5=S/TA	
	SAIL	TATA	SAIL	TATA	SAIL	TATA	SAIL	TATA	SAIL	TATA
201	0.0344	-0.089	0.3577	0.5641	-0.052	0.0744	0.6659	1.3797	0.3919	0.3101
201	0.1222	-0.049	0.3964	0.5670	0.0383	0.0742	0.7793	1.4012	0.4551	0.3606
201	0.1270	-0.086	0.4190	0.5419	0.0455	0.1052	0.8655	1.2712	0.5022	0.3756
201	0.1734	-0.053	0.4380	0.5324	0.0500	0.1020	0.9342	0.9177	0.5219	0.3750
201	0.2123	-0.005	0.4674	0.5369	0.0797	0.1172	1.0899	1.2507	0.5980	0.3528
201	0.3203	-0.063	0.4329	0.5115	0.0991	0.1213	0.9501	1.0545	0.5614	0.3283
200	0.5480	-0.111	0.5695	0.5616	0.2055	0.1358	1.8584	1.3629	0.7913	0.3896
200	0.6046	-0.148	0.6483	0.4081	0.2607	0.1442	3.1641	1.0362	1.1662	0.4139
200	0.6098	-0.512	0.6819	0.4481	0.4234	0.1641	4.9867	1.3727	1.4274	0.4183
200	0.6059	-0.123	0.5698	0.5222	0.4258	0.2574	3.0724	1.2080	1.4809	0.6856
Mea	0.3358	0.033	0.4981	0.5193	0.1576	0.1295	1.8366	1.2254	0.7896	0.4009

Table 3: Altman’s Z Score

Year	SAIL		TATA	
	Z Score	Zones of Discrimination	Z Score	Zones of Discrimination
2015-16	1.2	Very High-Likely	2.16	Grey Zone-Healthy
2014-15	1.8	Very High-Likely	2.26	Grey Zone-Healthy
2013-14	1.96	Very High-Likely	2.22	Grey Zone-Healthy
2012-13	2.12	Very High-Likely	2.03	Grey Zone-Healthy
2011-12	2.48	Grey Zone-Healthy	2.27	Grey Zone-Healthy
2010-11	2.51	Grey Zone-Healthy	2.19	Grey Zone-Healthy
2009-10	4.12	Healthy-Not Likely	2.51	Grey Zone-Healthy
2008-09	5.68	Healthy-Not Likely	2.19	Grey Zone-Healthy
2007-08	7.65	Healthy-Not Likely	2.43	Grey Zone-Healthy
2006-07	6.40	Healthy-Not Likely	3.36	Healthy-Not Likely
Mean	3.59		2.36	

Conclusion

Steel is the one of the core industries in any economy. But manufacturers are passing through torrid times. Only financially strong companies can survive in the long run. The Altman bankruptcy prediction model was employed to predict the financial stability of two companies. SAIL is performing well and has a strong financial health. Tata Steel is in the bankruptcy zone because of large debts. As already said,

Tata Steel should sell unproductive assets to clear their debts. It can be concluded that both companies financial health is not the same, and can concluded that they are under stress.

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