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ASSESSING CORPORATE FINANCIAL DISTRESS IN SELECTED STEEL COMPANIES IN INDIA: AN APPLICATION OF ALTMAN'S MODEL

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ABSTRACT

Measuring the financial health of a firm has been an extremely important need for both managers as well as investors. Several tools were 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 result not the future. 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 present state of financial health of a firm as well as to enable one to predict the future, particularly in terms of probability of bankruptcy. This paperattempts to investigate the financial health of selected Steel companies in India. The period of study is ten years from 2006-07 to 2015-16.. As per the calculated Z-Score, Ferro Alloys Corporation Ltd falls in to too healthy zone. Bajaj Industry Steel Limited,Steel authority Of India Limited, Steel Exchange of India Limited and Uttam Galva Steel Limited fall in to healthy zone. Facor Steel Limited , Jindal Steel Limited, JSW Steel Limited, Tata Steel Limited and VISA Steel Limited falls in to bankruptcy zone.The study concludes that the selected steel companies' overall financial health is found to be satisfactory during the study period.

KEYWORDS:

Steel Sector, Z-Score Model, Ratio Analysis, Financial Health

INTRODUCTION

A company's bottom line profit margin is the best single indicator of its financial health and long-term viability. Investors are constantly searching for one golden key measurement that can be obtained by looking at a company's financial statements for evaluating a stock, but it is simply not that easy. To accurately evaluate the financial health and long-term sustainability of a company, a number of financial metrics must be considered. Four main areas of financial health that should be examined are liquidity, solvency, profitability and operating efficiency. However, of the four, likely the best measurement of a company's health is the level of its profitability. There are a number of financial ratios that can be reviewed to gauge a company's overall financial health and to make a determination of the likelihood of the company continuing as a viable business. The general trend of financial ratios, whether they are improving over time, is also an important consideration.A company's financial health provide various financial information that investors and creditors use to evaluate a company's financial performance. Financial statements are also important to a company's managers because by publishing financial statements, management can communicate with interested outside parties about its accomplishment running the company. Different financial statements focus on different areas of financial performances.

Steel is crucial to the development of any modern economy and is considered to be the backbone of human civilization. The level of per capita consumption of steel is treated as an important index of the level of socio-economic development and living standards of the people in any country. The Indian steel industry is very modern with state-of-the-art steel mills. Steel industry and its associated mining and metallurgy sectors have seen a number of major investments and developments in the recent past. India is expected to become the world's second largest producer of crude steel in the next 10 years, moving up from the third position, as its capacity is projected to increase to about 300 MT by 2025. This study has made a sincere attempt to analyze and predict the financial health/strength/soundness of the selected firms by using Altman's Z – Score Model for the selected firms from the Indian Steel industry.

LITEREATURE REVIEW

The literature review gives an idea about the research done previous by different authors. It has been carried out with the help of articles, reports published in different newspapers, journals, magazines by different financial institutions and from books also. **Altman (1968)** has conducted a study on to analyze the financial position using multiple discriminate analysisProf. Edward I. Altman selected five ratios of twenty two initially considered. He took 33

successful firms and 33 bankrupt firms between 1945 to 1965 and developed a model popularly known as Altman's Z-Score model. The model comprises the five ratios to predict corporate bankruptcy. He found that the bankruptcy model has an accuracy rate of 93% and is very successful in predicting failed and non-failed firms. The result yielded equations called Z-Score that correctly classified 94% of the bankrupt companies and 97% of the non bankrupt companies a year prior to bankruptcy. **Sarbapriya Ray (2011)** found that Present analysis reveals that fertilizer industry under our study was just on the range of collapse zone. In our study, Z values for all the seven years were less than 1.81(Z scores< 1.81=High probability of bankruptcy).**Bhargav H. Pandya (2012)** found from the study that Tata Steel has good ratios like return on average capital employed, return to equity shareholders measured in terms of return on equity and earnings per share during the reference period. Low debt equity ratio of TSL also signals low risk and avoidance of insolvency risk. **S.Nirmala & R.Karpagavalli (2012)** found that the financial health of Asian Paints is satisfactory and there is no risk of failure.**Sanjay Pandey, Vijay Verma And Vikas Jain (2013**) have conducted a study to analyze liquidity ,variation ,financial performance of the company . They have concluded that F-test reveled that there is association between financial variable.**B Vijayalakshmi & M. N. Sailaja (2013)** concluded that the financial health of selected tele communication companies is found to be poor during the study period.**Rooh Ambika.T & Sengottaiyan (2015)** have analyzed financial health and efficiency of selected fertilizer companies and reveled that one company SPICL has sound financial performance during the period while five have moderate and eight are not in the good financial position. **S.Thenmozhi & Ms.K.Tamilselv (2015)** have found that that the liquidity, working capital turnover efficiency and solvency position of the companies is that the financial health of Jsw, Tata Steel and Mahindra ugine were found to be in healthy zone .and others are found to be in unhealthy zone .

RESEARCH METHODOLOGY

All major industrial economies are characterized by the existence of a strong steel industry and the growth of many of these economies has been largely shaped by the strength of their steel industries in their initial stages of development. India's economic growth is contingent upon the growth of the Indian steel industry. Consumption of steel is taken to be an indicator of economic development.Above all these factors motivated to me study, evolution of financial health of steel companies in India. This study is an attempt to evaluate financial health of selected Indian steel companies. The data have been tabulated and then analyzed and interpreted with the help ofAltman's Z-Score Model as developed by Prof. Altman and ANOVA Analysis.

Altman's Multiple Discriminate Analysis Model (Z score Analysis)

About 40 years ago, Edward I, Altman, a financial economist at New York University's Graduate School of Business, developed a model for predicting the likelihood that a company would go bankrupt. This model uses five financial ratios that combine in a specific way to produce a single number. This number, called the Z= score, is a general measure of corporate financial health. The most famous failure prediction model is Altman's Z Score Model. Based on Multiple Discriminate Analysis (MDA), the model predicts a company's financial health based on a discriminate function of the firm.

$$\mathbf{Z = 1.2\ X_1 + 1.4\ X_2 + 3.3\ X_3 + 0.6\ X_4 + 0.99\ X_5}$$

Where:

Z = Discriminate function score of a firm

X_1= Working Capital / total assets

X_2= Retained earnings / total sales

X_3= Earnings before interest and taxes / total assets

X_4= Market value of equity / book value of total liabilities or reciprocal of debt- equity ratio

X_5= Sales / total assets

Table-1

Altman's Guidelines for Healthy Zone

Situation	Z- Score	Zone	
I	Below 1.8	Bankruptcy	Failure is certain
II	Between 1.8 To 2.99	Healthy	Uncertain to predict (Grey Area)
III	More Than 3.00	Too Healthy	No or Little Chances of failure

To interpret the resultant Z-Score, the following criterion is used:

1. Firms with a Z-Score greater than 2.99 are considered to be safe and thus have a relatively remote risk of bankruptcy.
2. Firms with a Z-Score between 1.81 and 2.99 are less clear, existing in a grey area where a clear statement cannot be made.
3. Firms with a Z-Score less than 1.81 are considered to be in distress and thus at higher risk of bankruptcy.

Objectives:

The main objective of the present study is to investigate the financial health of selected companies of steel sector in India .To attain this main objective, followings are other sub-objectives of the study: .

- To evaluate financial health of the sample companies.
- To analyze the consistency, stability and overall trends in the different ratio used in Altman Z-Score by ANOVA test.
- To undertake comparative analysis of financial health of selected steel companies through Z score model .

Sample selection& period of the study :

The study is based on secondary data collected from the published Annual Reports of selected 10 companies of steel sector India. The study has been based on NSE & BSE listed steel companies. Reason behind the selection of Bombay Stock Exchange (BSE) & National Stock Exchange (NSE) a listed company is that Indian stock market is highly influenced by the BSE & NSE INDEX. The following 10 companies are selected for the period of 2006-07 to 2015-16.

Table-2 Selected Steel Companies

SR NO.	NAME OF COMPANIES
1	Bajaj Steel Industry Limited
2	Facor Steel Limited
3	Ferro Alloys Corporation Ltd
4	Jindal Steel & Power Limited
5	JSW Steel Limited
6	Steel Authority Of India Limited
7	Steel Exchange Of India Limited
8	Tata Steel Limited
9	Uttam Galva Steels Limited
10	VISA Steel Limited

Period of the study: The study cover the period of ten years from 2006-07 to 2015-16.

Data Sources: The study is based on secondary data collected from the published Annual Reports of selected 10 companies of steel sector india.

DATA ANAYLSIS & INTERPRETATION

In this study of a comparative evaluation of financial health of selected steel companies in India from 2006-2007 to 2015-2016 have been undertaken. All aspects of companies are examined with the help of Z –Score analysis & ANOVA.

Table-3 Z-Score of Selected Companies

Year	Bajaj Steel Industries Limited	Facor Steel Limited	Ferro Alloys Corporation Limited	Jindal Steel & Power Limited	JSW Steel Limited	SAIL	Sreel Exchange of India Ltd.	Tata Steel Ltd.	Uttam Galva Steels Limited	VISA Steel Limited
2006-07	-3.05	3.65	2.4	1.33	1.07	3.76	3.03	3.03	2.67	1.16
2007-08	2.97	2.77	4.29	3.01	1.32	3.73	2.91	2.91	2.71	1.15
2008-09	3.82	2.36	3.53	1.43	0.86	4.52	2	2	3.3	0.41
2009-10	2.64	1.3	3.13	1.09	1.13	3.44	1.81	1.81	2.3	0.68
2010-11	2.2	1.71	5.45	1.1	1.2	2.02	1.84	1.84	2.5	0.86
2011-12	3.04	1.49	1.98	1.22	1.11	1.92	2.13	2.13	1.79	0
2012-13	2.35	0.89	2.35	1.07	1.19	1.61	1.48	1.48	1.88	0.13
2013-14	2.8	-0.97	2.46	0.87	1.17	1.47	1.46	1.46	1.86	0.1
2014-15	2.9	-2.41	2.46	0.69	1.15	1.37	1.39	1.39	1.74	-0.21
2015-16	1.96	-3.43	2	0.5	0.6	0.28	1.53	1.53	1.67	-0.7

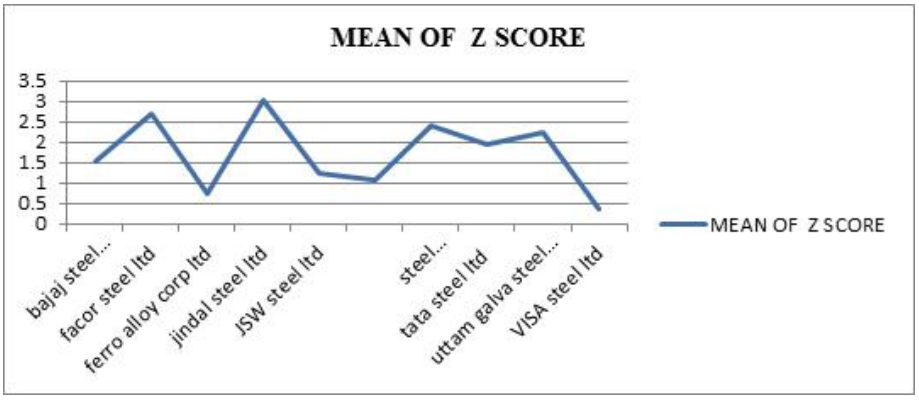
Bajaj Steel Industries Limited and Ferro Alloys Corporation Limited is having is increasing trend during the study period. The reason behind for good Z- score value is is efficiently utilizing its assets in generating sales. The overall financial health is considered to be satisfactory level.

Facor Steel ltd., Jindal Steel & Power Limited, JSW Steel Limited, Steel Authority Of India Limited, Steel Exchange Of India Limited, Tata Steel Limited, Uttam Galva Steel Limited and VISA Steel Limited are having decreasing trend during the study period. The reason behind for lower Z- score value is poor working capital management & lower utilization of assets in generating sales.

Table-4 Z- Score Mean of All Selected Companies

Name Of Company	Mean Of Z- Score	Zone
Bajaj Steel Industries Limited	2.7	Healthy
Facor Steel Limited	0.73	Bankruptcy
Ferro Alloy Corporation Limited	3.01	Too Healthy
Jindal Steel Limited	1.23	Bankruptcy
Jsw Steel Limited	1.08	Bankruptcy
Steel Authority Of India Limited	2.42	Healthy
Steel Exchange Of India Limited	1.96	Healthy
Tata Steel Limited	1.53	Bankruptcy
Uttam Galva Steel Limited	2.25	Healthy
Visa Steel Limited	0.36	Bankruptcy

Chart No.-1



INTERPRETATION

- Above chart-1 shows that mean z -score of all selected steel companies which depicts that Z- score varies from 3.01 to 0.36 . Only one company i.e. Ferro Alloys Corporation Ltd falls in to too healthy zone which is considered to be at financial sound position .
- Bajaj Industry Steel Limited, Steel authority Of India Limited, Steel Exchange Of India Limited and Uttam Galva Steel Limited fall in to healthy zone which is good sign. Overall financial position of these companies has been found to be at satisfactory level . The reason behind for good Z- score value is the selected company is efficiently utilizing its assets in generating sales and efficient working capital management & earnings during the study period.
- Facor Steel Limited , Jindal Steel Limited, JSW Steel Limited , Tata Steel Limited and VISA Steel Limited falls in to bankruptcy zone. Overall financial position of these companies has been found to be at dissatisfactory level. The reason behind for lower Z- score value of selected company is the poor working capital management and lower utilization of assets in generating sales.
- From the Z- score value mean classification of selected companies it is found that Overall financial health of selected steel companies in india are found to be at satisfactory level which is good sign for Indian steel industry .

ANOVA (Single) Factor Analysis:

Analysis of variance or ANOVA can be used to compare the means between two or more groups of values. ANOVA test is applied in this study to analyze the consistency, stability and overall trends in the different ratio used in Altman Z-Score.

1. Working Capital to Total Assets Ratio (X_1):

Table-5 ANOVA of Working Capital to Total Assets Ratio

ANOVA						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F critical**
Between Groups	36782095	10	3678210	4336677	1.7E-274	1.927679
Within Groups	83.96815	99	0.848163			
Total	36782179	109				

INFERENCE

Since the calculated value (4336677) is greater than the table value (1.927679), it is proved that the there is a significant difference between Networking Capital to Total Assets Ratio in the selected companies.

2. Retained Earnings to Total Assets Ratio (X_2):

Table-6 ANOVA of Retained Earnings to Total Assets Ratio

ANOVA						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Groups	36774137	10	3677414	4210837	7.3E-274	1.927679
Within Groups	86.45882	99	0.873321			
Total	36774223	109				

INFERENCE

Since the calculated value (4210837) is greater than the table value (1.927679), it is proved that the there is a significant difference between Retained earnings to total assets ratio in the selected companies.

3. Earnings Before Interest & Taxes to Total Assets Ratio(X_3):

Table-7 ANOVA of Earnings before Interest & Taxes to Total Assets Ratio

ANOVA						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F Crit**
Between Groups	36779505	10	3677951	4331671	0.00000018	1.927679
Within Groups	84.05927	99	0.849084			
Total	36779589	109				

INFERENCE

Since the calculated value (4331671) is greater than the table value (1.927679) and it is proved that there is a significant difference between Earnings before Interest & Taxes to Total Assets Ratio in the selected companies.

4. Market Value of Equity to Book value of Debt(X_4):

Table-8 ANOVA of Market Value of Equity to Book value of Debt

ANOVA						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Groups	36777456	10	3677746	4340452	0.0000016	1.927679
Within Groups	83.88454	99	0.847319			
Total	36777540	109				

INFERENCE

Since the calculated value (4340452) is greater than the table value (1.927679) and it is proved that there is significant difference between Reciprocal of Debt /Equity Ratio in the selected companies.

5. Sales to Total Asset Ratio (X_5):

Table-9 ANOVA of Sales to Total Asset Ratio

ANOVA						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between Groups	36748350	10	3674835	3745538	0.0024	1.927679
Within Groups	97.1312	99	0.981123			
Total	36748447	109				

INFERENCE

Since the calculated value (3745538) is greater than the table value (1.927679) and it is proved that there is significant difference between the Sales to total assets Ratio in the selected companies.

FINDINGS

This study examines financial health of 10 selected steel companies in India from 2006-2007 to 2015-16 period.It is found that only one company i.e. Ferro Alloys Corporation Ltd falls in to too healthy zone. Bajaj Industry Steel Limited, Steel authority Of India Limited, Steel Exchange Of India Limited and Uttam Galva Steel Limited fall in to healthy zone. Facor Steel Limited , Jindal Steel Limited, JSW Steel Limited , Tata Steel Limited and VISA Steel Limited falls in to bankruptcy zone. From the Z-score value mean classification of selected companies it is found that Overall financial health of selected steel companies in india are found to be at satisfactory level which is good sign for Indian steel industry .From ANOVA factor analysis it is found that the calculated value is greater than the table value for all the ratios of Z-Score and hence, there is significant difference between the X_1, X_2, X_3, X_4, and X_5 variables of Z- score model in the selected companies.

CONCLUSION

An evaluation of financial position and health of the firm is a very crucial point for share holders. All the decision of firms is taken on the basis of financial soundness of a firm. Under this background Altman's Z - score dominates for deciding the financial bankruptcy of a firm and there by a firm can easily judge its financial condition. The present study is conducted with the parameters of liquidity, profitability, sustainability, feasibility and compares the financial performance of selected firm's of steel industry. From this study it is found that only Ferro Alloy Corp Ltd is found in too healthy zone while others are in either healthy zone or under unhealthy zone. The study concludes that the selected steel companies' overall financial health is satisfactory during the study period.

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