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MEASURING THE FINANCIAL HEALTH OF SELECTED LARGE SCALE IRON AND STEEL COMPANIES IN INDIA USING Z-SCORE MODEL

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ABSTRACT

In order to survive and continue to be in business, it is essential that an organization should successfully manage its finance which requires more attention and care. The prediction and prevention of financial distress is one of the major factors, which will help to avoid bankruptcy. Therefore, it is important to monitor the financial position and health of a company through its financial statements. This paper analyses the financial health of selected large scale Iron and Steel Companies in India for twelve years from 1997-98 to 2008-09 by using Z-score, developed by Altman. The Z score is a measure of a company's health and it utilizes several key ratios for its formulation. The findings indicate that the financial health of RINL SAIL and UGSL were good and there is no scope of bankruptcy, where as the financial health of other selected companies were not in healthy Zone in many years.

KEYWORDS

Financial Health, Financial Performance, Steel Industry, Z score.

INTRODUCTION

Survival of the business in the modern world is possible only when, apart from other things, it has sufficient finance. In order to survive and continue to be in business, it is essential that an organization should successfully manage its finance which requires more attention and care. Thus, Finance is a significant facet of every business, both excessive as well as inadequate finance position are dangerous from the business point of view. Ineffective management is one of the important factors causing industrial sickness. Many variables are available to indicate the business sickness. The prediction and prevention of financial distress is one of the major factors, which will help to avoid bankruptcy. Therefore, it is important to monitor the financial position and health of a company through its financial statements. The principal objective of this research is to ascertain the financial health of selected large scale Iron and Steel Companies in India and consistency of financial performance for twelve years from 1997-98 to 2008-09.

Ratio analysis is one of the most commonly used tool to evaluate the various aspects of the financial performance of the companies. Single ratio does not convey much of the sense. Therefore Edward I. Altman (1968) combined a number of accounting ratios to form an index of the profitability, which is an effective indicator of corporate performance in predicting bankruptcy which is called Z score analysis. Various studies have been conducted over the period by applying Z score analysis to measure the financial health.

OBJECTIVES OF THE STUDY

1. To evaluate the efficiency of financial performance of selected companies of steel industry in India.
2. To examine the overall financial performance of the selected companies of steel industry in India.
3. To predict the financial health and viability of the selected companies of steel industry in India.

METHODOLOGY OF THE STUDY

The iron and steel industry is selected for the present study, considering its importance as the backbone of economic growth in any country. At the end of March 2008, the database of capita line has made compilation for 27 large companies and 270 small and medium companies. The criteria adopted for the selection of companies in the present study is market share above 1 per cent. Eleven companies satisfied the criteria of market share above 1 per cent. Due to non-availability of financial data, in the present study only eight large companies have been selected.

TABLE 1: LIST OF SAMPLE COMPANIES INCLUDED IN THE PRESENT STUDY

S.No.	Company Name	Sector	Market share as on March 2008 (%)
1.	Steel Authority of India Limited. (SAIL)	Public	21.83
2.	Tata Iron and Steel Company (TISCO)	Private	8.58
3.	JSW Steel Limited (JSWSL)	Private	6.33
4.	Essar Steel Limited (ESL)	Private	5.87
5.	Rastriya Ispat Nigam Limited (RINL)	Public	5.05
6.	Ispat Industries Limited (IIL)	Private	4.67
7.	Bhushan Steel Limited (BSL)	Private	2.17
8.	Uttam Galva Steel Limited (UGSL)	Private	1.10
Total Market Share of Sample companies			55.60

Source: CMIE

The study covers a period of twelve years from 1997 - 1998 to 2008 - 2009. The study is based on secondary data. Secondary data were collected from capita line and Centre for Monitoring Indian Economy (CMIE) database. The 'Z' Score analysis has been adopted to monitor the financial health of the company to predict as well as to avoid business failure and subsequent bankruptcy.

LIMITATIONS OF THE STUDY

The following are the limitations of the study.

1. The study is based on secondary data taken from database of capita line and CMIE as its findings depends entirely on the accuracy of such data.
2. The study was limited to only eight large iron and steel companies.

REVIEW OF LITERATURE

The review of literature plays an important role in establishing the backdrop for any research work in social sciences. It also enables the present researcher to find out the scope for further study and to frame appropriate objectives for the proposed evaluation. Since the proposal of the study is to measure the financial health, the previous studies made in this area of research are briefly reviewed.

Johah Aiyabei (2002) undertook a study on “ Financial Distress: Theory, Measurement and Consequence” and applied Z score model to examine the financial performance of small business firms based in Kenya and discussed the theoretical aspect of financially distressed firm based on a cyclical concept.

Krishna chaitanya V (2005) in his study on “Measuring Financial Distress of IDBI using Altman Z Score Model” used Z Score Model to measure the financial distress of IDBI and concluded that IDBI is likely to become insolvent in the years to come.

Thirunarayanamy (2006) in his study entitled “Co-operative Sugar Mills in Tamil Nadu an analysis of Sickness and Revival Measures” revealed that the sickness in co-operative sugar mills was found to be increasing year by year. It is reflected by Altman’s Z- Score. He also revealed that the accumulated losses, Absolute technology, mismanagement in finance and production factors were the important causes for sickness in the mills. The deviation from HCL (High Level Commission) norms was due to the above mentioned factors, which clearly revealed the weak position of the mills. The study concluded that better management practices and strict implementation of HCL norms would produce better results.

Kannadhasan M (2007) carried out a study on “Measuring Financial Health of a Public Limited Company Using ‘Z’ Score Model - A Case Study”. The principal objective of his study is to ascertain the financial health of Wendt (India) Limited company and consistency of financial performance for five financial years 2001-02 to 2004-05. The study concluded that the company is maintaining good financial performance throughout the study period.

Dheenadhayan.V (2008) in his study on “Financial Health of Steel Authority of India Limited” adopted ‘Z’ Score to predict the corporate failure of steel authority of India Limited. The Z score of SAIL showed a rising trend throughout the study period and it was concluded that the financial health of the SAIL was good.

Venkat Janardhan Rao and Durga Prasad (2009) carried out a study on “Z- Score Analysis – A Tool to Predict Financial Health” and examined the overall financial performance of Mahindra and Mahindra Limited and Eicher Motors. They compared the financial performance of both the companies and revealed that the performance of Eicher Motors Limited is better than Mahindra and Mahindra Limited.

Suriamurthi and Velavan, (2010) in their study on “Measuring Financial Health of E.I.D Parry Sugar Limited using ‘Z’- Score Model – A Case Study” examined the financial health of E.I.D Parry Sugar Limited for a period of ten years from 1998-99 to 2007-08. He arrived at a conclusion that the financial health of the E.I.D Parry Sugars Limited during the study period is healthy.

Maheswara reddy. D and Reddy C.R (2011), in their study on “Application of Z score Analysis in evaluating the financial health of pharmaceutical companies- A case study “ made an attempt to predict the financial health of two selected sample pharmacy companies (Aubindo Datong Bio- Pharmacy limited and Ranbaxy Laboratories Limited) for five years from 2005-06 to 2009-10 using modified Altman’s model. The study concluded that the overall financial health of both the companies was good.

Z – SCORE ANALYSIS

The financial health of the company can be determined through multiple discriminate analysis of Edward Altman who has indicated the financial health of an organization through Z scoring. The formula used to evaluate the Z score analysis as established by Altman is

$$Z = 1.2 x_1 + 1.4x_2 + 3.3 x_3 + 0.6 x_4 + 0.99 x_5$$

Where as

- Z = Overall index.
- X₁ = Ratio of Working Capital to Total Assets (WC/TA)
- X₂ = Ratio of Net Operating Profit to Sales (NOP/S)
- X₃ = Ratio of Earnings Before Interest And Taxes to Total Assets (EBIT/ TA)
- X₄ = Ratio of Market Value of Equity to Book Value of Debt. (MVE/ BVD)
- X₅ = Ratio of Sales to Total Assets (S/TA)

MEASUREMENT OF FINANCIAL HEALTH

According to Altman, the following three situations are considered for studying financial health of selected companies of steel industry in India.

1. Below ‘Z’ score of 1.8, the company is considered to be in the bankruptcy Zone. Its failure is certain and extremely likely and would occur probably within a period of two years.
2. If a company has a ‘Z’ score between 1.8 and 2.99, its financial viability is considered to be healthy. The failure in this situation is uncertain to predict.
3. Above ‘Z’ score of 2.99, the company is in a too healthy Zone. Its financial health is viable and there is no risk of a fall.

TABLE 2: ALTMAN GUIDELINES

Situation	Z score	Zones	Remarks
1.	Below 1.8	Bankruptcy Zone	Certain to fall
2.	1.8 – 2.99	Healthy Zone	Uncertain to Predict
3.	Above 2.99	Too Healthy Zone	Not to fall

Source: Altman (1968)

ANALYSIS AND RESULTS

SAIL (STEEL AUTHORITY OF INDIA LIMITED)

The Z score with respect to SAIL has been computed and presented in Table 3. The final Z score indicates that the company was sick from 1997-98 to 2002-03, since its Z score values were less than 1.8. Where as in 2003-04, the financial health of the company was in healthy Zone, since the Z score are between 1.8 and 2.99. It is also found that the Z score during the period 2004-05 reached too healthy Zone.

TABLE 3: Z SCORE VALUE OF SAIL

YEAR	X1 (WC/TA)	X2 (NOP/S)	X3 (EBIT/TA)	X4 (MVE/BVD)	X5 (S/TA)	Z score
1997-98	0.26	0.19	0.08	0.21	0.45	1.43
1998-99	0.24	0.11	0.03	0.20	0.47	1.14
1999-00	0.10	0.08	0.01	0.27	0.70	1.14
2000-01	0.08	0.15	0.06	0.29	0.76	1.45
2001-02	0.02	0.08	-0.01	0.30	0.81	1.10
2002-03	0.00	0.13	0.07	0.32	1.09	1.71
2003-04	-0.05	0.22	0.26	0.48	1.55	2.97
2004-05	0.26	0.39	0.62	0.72	1.78	5.16
2005-06	0.29	0.26	0.36	0.96	1.66	4.19
2006-07	0.44	0.32	0.45	0.99	1.59	4.70
2007-08	0.50	0.33	0.45	1.36	1.52	4.95
2008-09	0.49	0.25	0.28	0.55	1.23	3.45

Source: Computed

TISCO (TATA IRON AND STEEL COMPANY)

The Z scoring of the five key ratios of the TISCO from 1997-98 to 2008-09 are calculated and shown in Table 4. It can be seen from the analysis that the Z scores for TISCO is in bankruptcy zone (below 1.8) till 2001-02 and in 2008-09. It is also found that only in 2004-05 and 2005-06 the financial health of the company lies in too healthy zone (above 2.99) and in the remaining period the Z scores for TISCO is in the healthy zone.

TABLE 4: Z SCORE VALUE OF TISCO

YEAR	X1 (WC/TA)	X2 (NOP/S)	X3 (EBIT/TA)	X4 (MVE/BVD)	X5 (S/TA)	Z Score
1997-98	0.16	0.18	0.10	0.08	0.66	1.49
1998-99	0.10	0.19	0.09	0.07	0.61	1.34
1999-00	0.04	0.21	0.11	0.11	0.64	1.42
2000-01	0.03	0.22	0.11	0.11	0.72	1.50
2001-02	0.01	0.18	0.08	0.08	0.82	1.40
2002-03	-0.07	0.25	0.22	0.09	1.18	2.24
2003-04	-0.19	0.33	0.37	0.11	1.36	2.90
2004-05	-0.12	0.42	0.56	0.20	1.48	3.92
2005-06	-0.08	0.41	0.44	0.22	1.23	3.31
2006-07	0.30	0.42	0.27	0.06	0.74	2.63
2007-08	0.64	0.45	0.18	0.34	0.43	2.65
2008-09	0.01	0.40	0.15	0.23	0.43	1.65

Source: Computed

JSWSL (JSW STEEL LIMITED)

The Z score of five important variables in Altman's Z score equation for JSWSL are analyzed and presented in Table 5. It is imperative from the analysis that the financial health of the company was highly critical till 2002-03 and also in 2008-09 since the Z values were less than 1.8 whereas in the remaining years, the financial health are noticed as likely to be sick since its Z score values are from 1.8 to 2.99.

TABLE 5: Z SCORE VALUE OF JSWSL

YEAR	X1 (WC/TA)	X2 (NOP/S)	X3 (EBIT/TA)	X4 (MVE/BVD)	X5 (S/TA)	Z score
1997-98	-0.06	0.19	0	0.44	0.06	0.54
1998-99	-0.14	0.15	0.01	0.31	0.13	0.40
1999-00	-0.14	0.16	0.01	0.26	0.16	0.42
2000-01	-0.13	0.19	0.02	0.27	0.19	0.54
2001-02	-0.05	0.12	0.01	0.24	0.27	0.56
2002-03	-0.03	0.18	0.06	0.27	0.37	0.96
2003-04	0.02	0.44	0.17	0.34	0.52	1.94
2004-05	0.04	0.36	0.27	0.12	0.91	2.44
2005-06	0.05	0.33	0.20	0.12	0.73	1.99
2006-07	0.02	0.33	0.25	0.12	0.88	2.28
2007-08	-0.07	0.32	0.20	0.07	0.75	1.82
2008-09	-0.15	0.17	0.08	0.05	0.73	1.09

Source: Computed

ESL (ESSAR STEEL LIMITED)

The Z scores of ESL has been computed and presented in Table 6. It can be seen from the analysis that the Z scores for ESL are less than 1.8 during the period from 1997-98 to 2008-09 except during 2004-05 and 2007-08. In 2004-05 and 2007-08 it touches healthy Zone. The financial health of the ESL is never in the too healthy Zone during the study period.

TABLE 6: Z SCORE VALUE OF ESL

YEAR	X1 (WC/TA)	X2 (NOP/S)	X3 (EBIT/TA)	X4 (MVE/BVD)	X5 (S/TA)	Z Score
1997-98	0.01	0.36	0.07	0.01	0.35	1.11
1998-99	0.16	0.16	-0.01	0.07	0.31	0.74
1999-00	0.04	0.18	0	0.07	0.37	0.71
2000-01	-0.01	0.26	0.05	0.07	0.41	0.97
2001-02	-0.21	-0.12	0.06	0.07	0.62	0.44
2002-03	0.13	0.31	0.04	0.06	0.26	1.02
2003-04	0.14	0.28	0.08	0.10	0.63	1.52
2004-05	0.22	0.29	0.19	0.21	0.94	2.38
2005-06	0.12	0.28	0.1	0.38	0.55	1.66
2006-07	0.08	0.26	0.11	0.2	0.69	1.64
2007-08	0.05	0.23	0.13	0.19	0.99	1.93
2008-09	0.15	0.16	0.07	0.16	0.96	1.70

Source: Computed

RIN L (RASTRIYA ISPAT NIGAM LIMITED)

The Z score with respect to RINL for the study period has been computed and presented in Table 7. It is imperative from the analysis that Z score for the RINL is not less than 1.8 during the study period. It shows that financial health of RINL during the study period is never in bankruptcy zone. It is also revealed that till 1999-2000 the financial health is in healthy zone. It touches too healthy zone in 2000-01

TABLE 7: Z SCORE VALUE OF RINL

YEAR	X1 (WC/TA)	X2 (NOP/S)	X3 (EBIT/TA)	X4 (MVE/BVD)	X5 (S/TA)	Z score
1997-98	-0.10	0.3	0.04	2.91	0.29	2.59
1998-99	-0.18	0.01	-0.02	2.88	0.52	2.09
1999-00	0.08	0.10	-0.03	3.34	0.46	2.73
2000-01	0.09	0.17	0.01	3.41	0.57	3.13
2001-02	0.10	0.18	0.04	3.93	0.74	3.76
2002-03	0.14	0.26	0.15	6.59	0.99	6.24
2003-04	0.30	0.38	0.32	12.28	1.11	10.93
2004-05	0.68	0.45	0.30	14.73	0.98	12.85
2005-06	0.77	0.32	0.22	14.41	0.84	12.17
2006-07	0.80	0.33	0.21	8.54	0.76	8.35
2007-08	0.72	0.39	0.25	17.76	0.76	14.37
2008-09	0.52	0.25	0.16	7.77	0.69	7.17

Source: Computed

IIL (ISPAT INDUSTRIES LIMITED)

The Z scores of IIL has been computed and presented in Table 8. It can be seen from the analysis that the Z scores for IIL is in the healthy zone during the period 2004-05 and rest of the period, it is in the bankruptcy zone.

TABLE 8: Z SCORE VALUE OF IIL

YEAR	X1 (WC/TA)	X2 (NOP/S)	X3 (EBIT/TA)	X4 (MVE/BVD)	X5 (S/TA)	Z Score
1997-98	0.08	0.21	0.04	0.04	0.26	0.81
1998-99	0.10	0.17	0.02	0.15	0.21	0.73
1999-00	0.03	0.14	0.02	0.19	0.20	0.62
2000-01	0.12	0.12	0.01	0.17	0.27	0.72
2001-02	-0.02	-0.03	-0.03	0.15	0.23	0.16
2002-03	0.06	0.21	0.05	0.15	0.37	1.00
2003-04	0.07	0.18	0.05	0.14	0.43	1.02
2004-05	0.11	0.34	0.19	0.19	0.73	2.09
2005-06	0.01	0.08	-0.02	0.28	0.49	0.73
2006-07	0.06	0.23	0.09	0.28	0.66	1.53
2007-08	0.01	0.22	0.11	0.32	0.82	1.71
2008-09	-0.08	0.09	0.00	0.31	0.88	1.11

Source: Computed

BSL (BHUSHAN STEEL LIMITED)

The Z scores of BSL has been computed and presented in Table 9. It can be seen from the analysis that the Z scores for BSL is in the healthy Zone during the period 1999-2000 to 2004-05 and 2006-07 and rest of the period, it is in the bankruptcy Zone.

TABLE 9: Z SCORE VALUE OF BSL

YEAR	X1 (WC/TA)	X2 (NOP/S)	X3 (EBIT/TA)	X4 (MVE/BVD)	X5 (S/TA)	Z score
1997-98	0.28	0.17	0.12	0.08	0.56	1.58
1998-99	0.27	0.19	0.13	0.06	0.72	1.78
1999-00	0.30	0.19	0.12	0.06	0.83	1.89
2000-01	0.30	0.19	0.11	0.05	0.84	1.86
2001-02	0.35	0.18	0.11	0.06	0.95	2.03
2002-03	0.3	0.18	0.09	0.05	0.86	1.80
2003-04	0.34	0.18	0.12	0.04	1.02	2.11
2004-05	0.33	0.16	0.13	0.03	1.29	2.36
2005-06	0.22	0.15	0.1	0.02	0.93	1.75
2006-07	0.21	0.18	0.15	0.01	0.85	1.86
2007-08	0.16	0.21	0.13	0.01	0.57	1.50
2008-09	0.09	0.21	0.14	0.01	0.49	1.36

Source: Computed

UGSL (UTTAM GALVA STEEL LIMITED)

The Z scores of UGSL has been computed and presented in Table 10. The Z score value of UGSL indicates that less than 1.8 during the period from 1997-98 to 2001-02. It is also found that the Z scores during the period 2003-04 and 2004-05 was in the too healthy Zone, since the Z scores were more than 2.99 where as in the remaining years the Z scores for UGSL were in the healthy Zone.

TABLE 10: Z SCORE VALUE OF UGSL

YEAR	X1 (WC/TA)	X2 (NOP/S)	X3 (EBIT/TA)	X4 (MVE/BVD)	X5 (S/TA)	Z score
1997-98	0.22	0.11	0.07	0.13	0.88	1.61
1998-99	0.09	0.12	0.04	0.11	0.73	1.21
1999-00	0.11	0.08	0.04	0.10	1.02	1.46
2000-01	0.04	0.07	0.04	0.15	1.31	1.69
2001-02	0.10	0.07	0.03	0.20	1.15	1.60
2002-03	0.12	0.11	0.13	0.20	1.63	2.49
2003-04	0.16	0.09	0.14	0.19	2.10	3.01
2004-05	0.18	0.10	0.23	0.17	2.72	3.95
2005-06	0.30	0.11	0.14	0.10	1.49	2.53
2006-07	0.19	0.12	0.19	0.11	1.68	2.78
2007-08	0.04	0.11	0.2	0.11	1.84	2.78
2008-09	0.02	0.09	0.18	0.08	1.95	2.75

Source: Computed

FINANCIAL HEALTH OF SELECTED IRON AND STEEL COMPANIES - COMPARISON

The final Z score of the eight steel companies from 1997-98 to 2008-09 are separately analyzed to compare the financial health of the selected steel companies from 1997-98 to 2008-09. The Z scores of the eight companies for the above said period are shown in Table 11.

TABLE 11: FINANCIAL HEALTH OF THE SELECTED STEEL COMPANIES

YEAR	SAIL	TISCO	JSWSL	ESL	RINL	IIL	BSL	UGSL
1997-98	1.43	1.49	0.54	1.11	2.59	0.81	1.58	1.61
1998-99	1.14	1.34	0.40	0.74	2.09	0.73	1.78	1.21
1999-00	1.14	1.42	0.42	0.71	2.73	0.62	1.89	1.46
2000-01	1.45	1.50	0.54	0.97	3.13	0.72	1.86	1.69
2001-02	1.10	1.40	0.56	0.44	3.76	0.16	2.03	1.60
2002-03	1.71	2.24	0.96	1.02	6.24	1.00	1.80	2.49
2003-04	2.97	2.90	1.94	1.52	12.28	1.02	2.11	3.01
2004-05	5.16	3.92	2.44	2.38	12.85	2.09	2.36	3.95
2005-06	4.19	3.31	1.99	1.66	12.17	0.73	1.75	2.53
2006-07	4.70	2.63	2.28	1.64	8.35	1.53	1.86	2.78
2007-08	4.95	2.65	1.82	1.93	14.37	1.71	1.50	2.78
2008-09	3.45	1.65	1.09	1.70	7.17	1.11	1.36	2.75

Source: Computed

It is inferred from the table that the financial health of RINL was better than others since its scores were greater than 2.99 in 9 years out of the total period of the study which consists of 12 years. The next best company according to financial health analysis is SAIL whose financial health had been good for 5 years out of 12 years. In UGSL, the financial health had been good for 2 years but for 5 years the financial health was likely to be sick. In TISCO the financial health was good for 2 years and the financial health was likely to be sick for 4 years. In BSL, JSWSL, ESL and IIL the financial health was moderate for 7 years, 5 years, 2 years and 1 year respectively. The worst situation was noticed in IIL where the financial health was very poor for 11 years, since Z scores were less than 1.8.

CONCLUSION

Financial health of a firm is a centre theme for shareholders. In this context, an attempt has been made in the present study to have an insight into the examination of financial health of sample companies drawn from Indian Steel Industry. To evaluate the performance of a company, this study uses Z score model, which captures the predictive viability of a company's financial health by using a combination of financial ratios that ultimately predicts a score, which can be used to determine the financial health of a company. The study concluded that the financial health of RINL SAIL and UGSL were good and there is no scope of bankruptcy, whereas the financial health of other selected companies were not in healthy Zone in many years.

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