

AN ALTMAN'S Z SCORE MODEL ANALYSIS OF TATA MOTORS LTD.

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Abstract

It has been seen that due to intensification of investors, the numbers of performance evaluation measures are evolving day-by-day. One of the most famous models to predict the financial distress of the company is Altman Z score model. Altman Z score model helps the investor to analyse the financial health of the company in a more better way than anything else. In this research paper, an attempt has been made to analyse the Tata Motors Ltd. By using the Altman Z Score model. The core part of this paper is data analysis has been carried out on the basis of Altman Z Score model. To analyse the present financial health of Tata Motors Ltd., last five years data from 2017 to 2021 has been taken as a period of the research study. After analysing the five years data and all the factors of Altman Z score model, it is noticed that Tata Motors Ltd. is in distress zone now-a-days. However, the latest data shows that company is trying verywell to recover its financial distress.

Keywords: Financial Distress, Altman Z score model, Performance Evaluation, Zone.

INTRODUCTION

Since last few decades, the number of investors is increasing in terms of investment into securities and funds. With the increasing interest of investment, the investors are also required to measure the performance of the companies with the modern techniques. As investment into securities and funds are risky, the investors must try to secure the future of the investment by evaluating the necessary facts and figures of the company in which they are interested to invest their money.

What is Altman Z-Score Model?

In 1968, Edward I. Altman who was an Assistant professor at New York University, published the Z-Score model to forecast about the probability of bankruptcy of the company within a specific time which is mostly about 2 years, in short, this model is useful to check the status of financial distress of any company. It helps the company in measuring the financial health by using some control factors of the balance sheet and profit & loss account. Actually, the Z-score model is a linear combination of five most useful ratios from the balance sheet and income statement. Altman weighted those five ratios with the coefficients to estimate the bankruptcy. It is a statistical method of discriminant analysis.

Z-Score Model formula for manufacturing firms is as below:

$$Z = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 0.999 X5$$

Where,

$$X1 = \frac{\text{Working Capital}}{\text{Total Assets}}$$

$$X2 = \frac{\text{Retained Earnings}}{\text{Total Assets}}$$

$$X3 = \frac{EBIT}{Total Assets}$$

$$X4 = \frac{Market Cap}{Total Liabilities}$$

$$X5 = \frac{Revenue}{Total Assets}$$

X1: The Working Capital/Total Assets ratio is a measure of the net liquid assets of the firm relative to the total capitalization. Working capital is defined as the difference between current assets and current liabilities. Ordinarily, a firm experiencing consistent operating losses will have shrinking current assets in relation to total assets. Altman found this one proved to be the most valuable liquidity ratio comparing with the current ratio and the quick ratio. This is however the least significant of the five factors.

X2: Retained Earnings/Total Assets: this ratio measures the leverage of a firm. Retained earnings is the account which reports the total amount of reinvested earnings and/or losses of a firm over its entire life. Those firms with high RE, relative to TA, have financed their assets through retention of profits and have not utilized as much debt.

X3, Earnings Before Interest and Taxes/Total Assets: This ratio is a measure of the true productivity of the firm's assets, independent of 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. This ratio continually outperforms other profitability measures, including cash flow.

X4, Market Value of Equity/Book Value of Total Liabilities: 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.

X5, Revenue/Total Assets: The capital-turnover ratio is a standard financial ratio illustrating the sales generating ability of the firm's assets.

Z Score Decision rule:

If Z Score is greater than 2.99	The company is in Safe Zone
If the Z Score is greater than 1.81 but less than 2.99	The company is in Grey Zone
If Z Score is less than 1.81	The company is in Distress Zone

REVIEW OF LITERATURE

Rohini (2016) research is based on the model to understand Altman Z score of some selected firms from the BSE and NSE listed companies. The data collection period is for 5 years from 2011-2015. The researcher selects manufacturing and non-manufacturing both the types of companies. The research concludes that none of the companies most of the firms are suffering with the distress zone.

Setyani (2016) the research was based on again Altman Z score and the study period was 2009 to 2014. The Author concludes that the retained earnings to total assets ratio have no significant effect on the company's performance. The other ratio of Z score, EBIT to total assets has the only significant factor which affect the company's stock price but not fully.

Sanjaysinh (2020) The Author has used the Altman Z Score model to analyse the financial distress level of the Havells Company. The Study Period is 10 years from 2009 to 2018. Apart from all the factors of Altman Z Score, the author has also collected the data regarding the ratios like Current Assets ratio, Quick Assets ratio, Debtors Turnover ratio, Liquidity ratio, Return on Assets ratio, Return on Capital Assets ratio etc. On the basis of ten years of Altman Z Score, the research concludes that the Havells company is in Safe Zone in all the ten years.

Shivanisinh (2021) The research study is based on evaluating financial efficiency of selected FMCG companies of India by the Altman z-score model. The study period is five years from 2015 to 2019. The Author has selected the five companies from FMCG sector i.e., Dabur India Ltd., Godrej Consumer Ltd., Marico Ltd., Emami Ltd., and Sheela Foam Ltd. by using convenience sampling method. With the help of Altman Z score, it is being analysed that none of the selected companies are in distress zone.

RESEARCH GAP

This Research Paper is carried out mainly due to understand the indicators of companies' bankruptcy situation. According the one article on CNBC18 of December 10, 2021, around 285 firms faced bankruptcy proceedings as per the National Company Law Tribunal (NCLT) and Board of India (IBBI). To know how to evaluate the distress level of the company, researcher is carried out this research. While researching about the bankruptcy, researcher has found that one person Edward I. Altman has developed a model called, 'Altman Z Score' which will be useful to forecast about the probability of bankruptcy of the company. Researcher has tried his best to find out the thesis on this model of bankruptcy but has only be able to find hardly a few research papers not even carried out for Indian company which motivates the author to carried out the research on Altman Z Score to know the Insolvency and Bankruptcy of Indian Company.

OBJECTIVES OF THE STUDY

1. To know the financial health of the selected company.
2. To Evaluate the distress level of the selected company.
3. To identify zone of the selected company.
4. To make an attempt to analyse the data of the selected company by using the most popular model of performance evaluation.

SAMPLE SIZE AND SAMPLING PROCEDURE:

Sample size in one. The company is selected by using the judgemental sampling method. The selection has been done on the basis of Market capitalization shown in the BSE and NSE listed companies.

DATA COLLECTION:

This case study is based on secondary data collection in which data has collected from the annual report of Tata Motors Ltd., websites and magazines.

PERIOD OF THE STUDY:

The period of the study will be of five years i.e. from 2017 to 2021.

LIMITATIONS OF THE STUDY:

1. Only one company is selected for this research.
2. Performance evaluation has been done through one model.
3. Data analysis has been done on the basis of only five years.

DATA ANALYSIS TOOLS AND TECHNIQUES:

As the title of this research paper shows, this research study is focusing on case study of Tata Motors Ltd. and on particular on model of Altman Z Score, the data analysis has been done only by using all the concerning factors of Altman Z Score.

Table No. 1 : Raw Data Sheet

RAW DATA SHEET	DATA in \$ Million				
	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
TATA MOTORS LTD.					
Total Current Assets	17679.64	20949.16	17675.69	16041.11	20171.21
Total Current Liabilities	17520.83	21950.52	20834.09	18744.9	21563.27
Total Assets	40525.98	49742.27	42986.64	42131.16	45905.15
Revenue	40371.71	44322.07	43080	34799.65	34079.17
Pre-Tax Income	1437.65	1594.89	-4569.8	-1466.7	-1602.97
Interest Expense	-643.85	-719.36	-828.7	-973.24	-1110.15
Retained Earnings	0	0	0	0	0
Market Cap	24212.41	17454.67	8530.38	3396.02	15920.19

Table No. 2 : Factor-wise Data

Factor-wise Data:	DATA in \$ Million				
TATA MOTORS LTD.	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
Total Current Assets	17679.64	20949.16	17675.69	16041.11	20171.21
Total Current Liabilities	17520.83	21950.52	20834.09	18744.9	21563.27
X1 = Working Capital / Total Assets					
Working Capital	158.81	-1001.36	-3158.4	-2703.79	-1392.06
Total Assets	40525.98	49742.27	42986.64	42131.16	45905.15
X1	0.0039	-0.0201	-0.0735	-0.0642	-0.0303
X2 = Retained Earnings / Total Assets					
Retained Earnings	0	0	0	0	0
Total Assets	40525.98	49742.27	42986.64	42131.16	45905.15
X2	0.0000	0.0000	0.0000	0.0000	0.0000
Pre-Tax Income	1437.65	1594.89	-4569.8	-1466.7	-1602.97
Interest Expense	-643.85	-719.36	-828.7	-973.24	-1110.15
X3 = EBIT / Total Assets					
EBIT	2081.5	2314.25	-3741.1	-493.46	-492.82
Total Assets	40525.98	49742.27	42986.64	42131.16	45905.15
X3	0.0514	0.0465	-0.0870	-0.0117	-0.0107
X4 = Market Cap / Total Liabilities					
Market Cap	24212.41	17454.67	8530.38	3396.02	15920.19
Total Liabilities	32337	35697.93	34955.68	34109.04	38776.08
X4	0.7488	0.4890	0.2440	0.0996	0.4106
X5 = Revenue / Total Assets					
Revenue	40371.71	44322.07	43080	34799.65	34079.17
Total Assets	40525.98	49742.27	42986.64	42131.16	45905.15
X5	0.9962	0.8910	1.0022	0.8260	0.7424

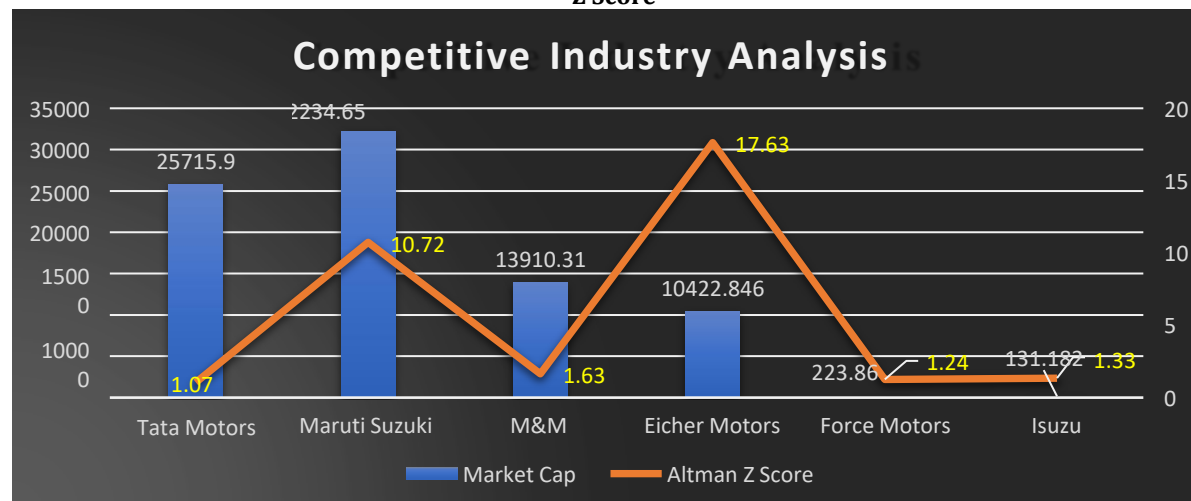
Table No. 3: Factor-wise Analysis

Factor	Multiplier	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
X1	1.20	0.0047	-0.0242	-0.0882	-0.0770	-0.0364
X2	1.40	0.0000	0.0000	0.0000	0.0000	0.0000
X3	3.30	0.1695	0.1535	-0.2872	-0.0387	-0.0354
X4	0.60	0.4493	0.2934	0.1464	0.0597	0.2463
X5	1.00	0.9962	0.8910	1.0022	0.8260	0.7424
		1.6196	1.3138	0.7732	0.7701	0.9169

Interpretation:

According to 'Z' Score Decision rule, if 'Z' Score is less than 1.81, the company is in distress zone. Factor-wise Analysis shows that Altman Z-score of Tata Motors Ltd. of all the five years is also less than 1.81. This implies bankruptcy possibility in the next two years.

Chart No. 1: Present Comparative Auto-mobile Industry Analysis with respect to Market Cap and Altman Z Score



FINDINGS

- Co's pre-tax profit was lowest in 2019 i.e. -4569.8 which affects the company most.
- The Altman Z-Score also shows the lowest during the period.
- Retained Earnings to Total Assets ratio of the company never ever shows the positive trend for tata motors as The proportion of Retained Earnings mobilization to total assets presented is zero in trend during the period of study.
- Company's performance with respect to the ratio of Working Capital to Total Assets shows negative trend for four consecutive years from 2018 to 2021.
- The proportion of the Market value of Equity to Total Liability recorded the variation during the period of study and it varies from 0.4493 to 0.0597.
- After March 2017, Company's Altman Z Score was dwindling like a sharp downward curve.
- However, Co. has recovered its Altman Z Score in the performance of 2021 after maintaining it into 2020. Which shows that Co. is working on overcoming to the situations of bankruptcy.
- The competitive industry analysis shows that Maruti Suzuki is 10 times and Eicher Motors is 17 times better than tata motors with respect to the Altman Z Score. Yet Co. is maintaining second highest position in terms of market cap.

CONCLUSION

Tata Motors has an Altman Z-Score of 1.07, which is also indicating it is in Distress Zones however, if we look towards the data of Altman Z-Score of last three years and present day, it shows that company is gaining day-by-day. Even though, this implied bankruptcy possibility in the two years, Tata Motors as usual shows the feat in its performance in last three to four years and tried to come out from the bankruptcy possibility.

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