

Application of ALTMAN Z Score On Five Selected Industries

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ABSTRACT

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The research paper talks about application of Altman Z score on five selected industries. Altman Z score is a predicting tool for bankruptcy. It helps to find whether the company is in safe, grey or distress zone. The research of this tool was on five industries i.e. FMCG-Personal care, Automobile – 2 & three wheeler, Automobile – four wheeler, Airlines, and Cement. Altman score is applied on certain selected companies of the five selected. All companies in Personal care industry are in safe zone. From Airlines industry, Spice Jet and Global Vectra are in distress zone. In Automobile – 2 & three wheeler, other than Scooter's India all other companies are in safe zone. For Automobile four wheeler industry, Tata motors is in distress zone due to its past data. And Cement industry, except for India Cement and Birla Corp, all are in safe zone. Though more research in cement industry is required, Altman Z score can be applied to more industries with listed as well as unlisted companies to get more clear view about the industry.

Keywords: Distress zone, Grey zone, Safe zone, Bankruptcy, Altman Z Score

Introduction

Financial stability or financial health of an organization is of utmost importance. Based on financial health, it shows how well the firm can carry out its operations in long run as adequate funds will be required to meet its long term and short term requirements. Financial stability of the organization is of utmost importance not only to management of the organization but also to its all external stakeholders, such as employees, creditors, stockholders, managers.

Financial distress or insolvency of a company means that the company is in a situation where it has difficulty or unable to repay its debt to its creditors. Financial distress or insolvency stage is before bankruptcy where the company is unable to pay to its creditors, employees, etc.

There are different techniques to find the financial health of the company. Among those one is Altman Z score Model. Altman Z score was published in 1968 by Edward I. Altman. Altman Z score model is a tool for predicting bankruptcy. Through this score we can find if the company is heading towards bankruptcy or not in 2 years. This model is effective in predicting the financial distress of an organization by using financial statements of the organization. In this model, different weights are assigned to different financial ratios. In total there are five financial ratios in this model. This model was exclusively for public manufacturing

companies at start but later was applicable to different companies also. It showed 72% accuracy when it was first published.

The formula for this Z score model is

$$Z = 1.2A + 1.4B + 3.3C + 0.6D + 1E$$

Where,

Z – Altman Z score

A – Working Capital/Total Assets

B – Retained Earnings/Total Assets

C – Earnings before interest and tax/Total Assets

D – Market value of Equity/Total Assets

E – Total Sales/Total Assets

Lower the Z score higher the possibility of the company going bankrupt. There is specified range to find the company is in which zone.

Lower than 1.8 Z score shows company is in distressed zone. In between 1.8 to 3 shows that company is in grey zone and higher than 3 shows that company is in safe zone.

For the research, five industry is analyzed which are, Cement industry, Automobile - 2 wheelers scooters and three wheelers industry, Automobile – Four wheeler industry, Airlines Industry, FMCG-Personal Care industry. Z score of all the companies in these industries are calculated and analyzed.

Literature Review

Financial Soundness of Cement Industry of Bangladesh: An Empirical Investigation Using Z-Score, A.N.K Mizan, Md. Mahabbat Hossain, ABC research house, November 2014, as per his study conducted for listed cement companies in Bangladesh, he finds this tool useful and suggests that this study could be used by management of the distressed companies, investors for their investment options. He concluded that 2 out of 5 companies i.e. HCL and CCL are financially sound and their core is higher than 2.99 whereas other company MCL is in grey Zone and their management needs to take strong decision on financial health and remaining two companies are financially distressed and management have to take necessary steps.

Application of Altman Z Score on Bse-Greenex Companies, Swalih M. M. Vinod M. S., Assistant Professor Department of Commerce Christ Nagar College, India, Journal of applied management and investments, volume 6 number 3 summer 2017, as per this research, investors can use this study for their investment decisions which has least impact on ecology. The author conducted research on 25 greenex companies listed on BSE-Greenex and found out that only 3 were in safe Zone other 10 were in grey Zone and remaining 12 were in distressed Zone. But still author recommends to invest in those 12 companies because they are making least negative impact on the nature and ecology. The author says that this research can be used as reference to analyze and make investment decisions of Greenex companies.

Bankruptcy Analysis of National Airlines Companies in Regional Asia After Covid-19 Pandemic, Asaduddin Abdullah, Noer AZam Achsani and Suhendi, Jurnal Aplikasi Manajemen dan Bisnis, Vol. 6 No. 3, September 2020, the author of this paper has conducted to find are the airlines company heading towards bankruptcy after covid-19 pandemic because it has caused huge losses for airline industry. The research was limited to 4 national airlines companies in regional Asia. The study showed Garuda Indonesia and Thai Airways have the possibility of going bankrupt. This research can be used by investors, corporations and Indonesian government.

Objectives

- To show the effectiveness of Altman Z Score in analysing the company
- To analyse Z score of five different industries.

- To understand financial soundness of companies in five different industries
- To understand the downside risk of the companies

Research Methodology

The research methodology used in the research is quantitative and secondary. All information regarding the same is publically available in the annual reports. Based on that information five financial ratios are calculated and multiplied with their weightages to find Z score. The research design is a mix of exploratory and descriptive.

The research consists of 5 industry i.e. Cement industry, Automobile - 2 wheelers scooters and three wheelers industry, Automobile – four wheelers industry, Airlines Industry, FMCG-Personal Care industry. Z score of all the companies in this industry are calculated.

For calculating Z score first you need to calculate five financial ratios i.e.

- Working capital/Total Assets
- Retained Earnings/Total Assets
- Earnings before interest and taxes/Total assets
- Market value of equity/Total Assets
- Total Sales/Total Assets

Working capital/Total Assets

Working capital is the difference between the current assets and current liabilities. Working capital determines short term financial health of the company. Positive working capital shows that company is able to meet its short term obligations and vice versa in case of negative working capital. Working capital/Total Assets shows how much are the working capital in terms of total assets of the organization.

Retained Earnings/Total Assets

Retained Earnings are the left over profit of the company after paying the dividend. Retained Earnings/Total Assets ratio if positive shows that company is utilizing their borrowed funds for their expenses. If this is the case then, there is high possibility of company going bankrupt and vice versa in case of negative ratio.

Earnings before interest and taxes/Total assets

Earnings before interest and tax; tells that how much the company is able to generate profit through its operations. This ratio shows how much operating profit the company is able to make using its total assets.

Market value of equity/Total Liabilities

Market value of equity also known as market capitalization is calculated by multiplying number of outstanding shares to current market price of the stock. Higher ratio shows that investors have confidence in the company's financial strength.

Total Sales/Total Assets

Total Sales/Total Assets ratio shows how well the management has utilized their available assets to generate sales. Higher the ratio means management

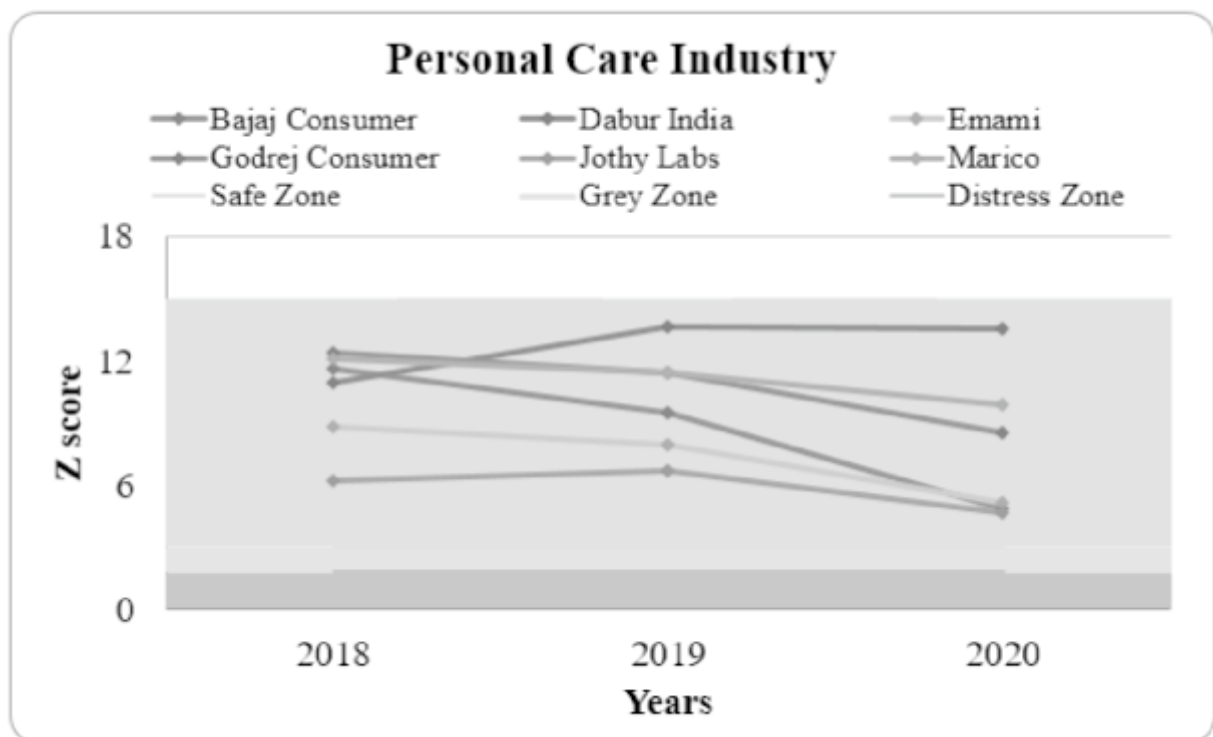
requires only small amount of investment to generate sales which will lead to increase in profitability of the company and vice versa in case of lower ratio.

Data Analysis

Data was collected of 5 industries, i.e. FMCG - Personal care, Auto – 2 wheelers & three wheelers, Auto – four wheelers, Cement industry, Airlines Industry. After collection of data, Z score of each company was calculated.

Company	2018	2019	2020
Bajaj Consumer	11.62	9.5	4.89
Dabur India	10.93	13.66	13.5
Emami	8.8	7.89	5.17
Godrej Consumer	12.37	11.43	8.55
Jothy Labs	6.16	6.64	4.7
Marico	12.09	11.4	9.87

FMCG – PERSONAL CARE INDUSTRY

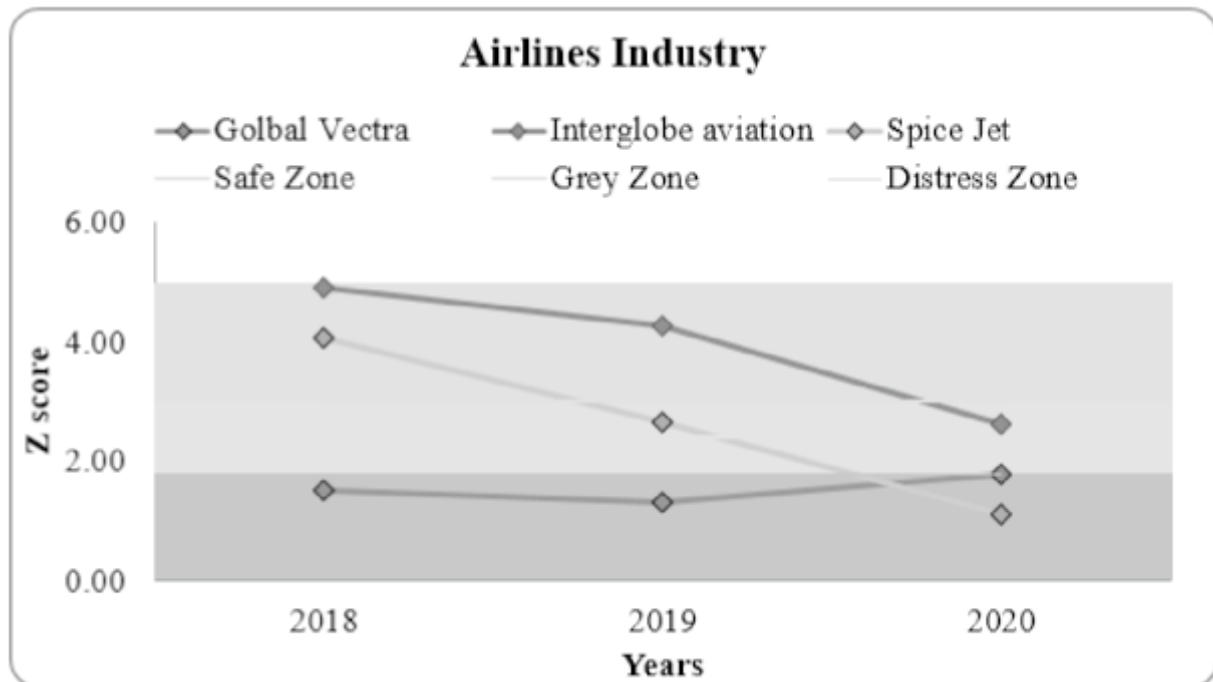


Comparing two companies i.e., Dabur India Ltd. and Emami Ltd., from the above chart it is clear that Dabur Ltd. is far from bankruptcy as per the data of three years as compared to Emami Ltd. Dabur Ltd.'s balance sheet is almost twice the size of Emami Ltd. Dabur India Ltd. has high amount of retained earnings as compared to other components. So they have better

Z score as compared to Emami Ltd. Comparing between two companies, Dabur Ltd.'s sales is almost 4000 cr. more than Emami Ltd. and retained earnings are also 3000 cr. more than Emami Ltd. This shows not due to just big balance sheet size, but company is utilizing its assets properly to earn profits.

AIRLINES INDUSTRY

Company	2018	2019	2020
Global Vectra	1.51	1.32	1.77
Interglobe aviation	4.89	4.28	2.62
Spice Jet	4.06	2.64	1.11

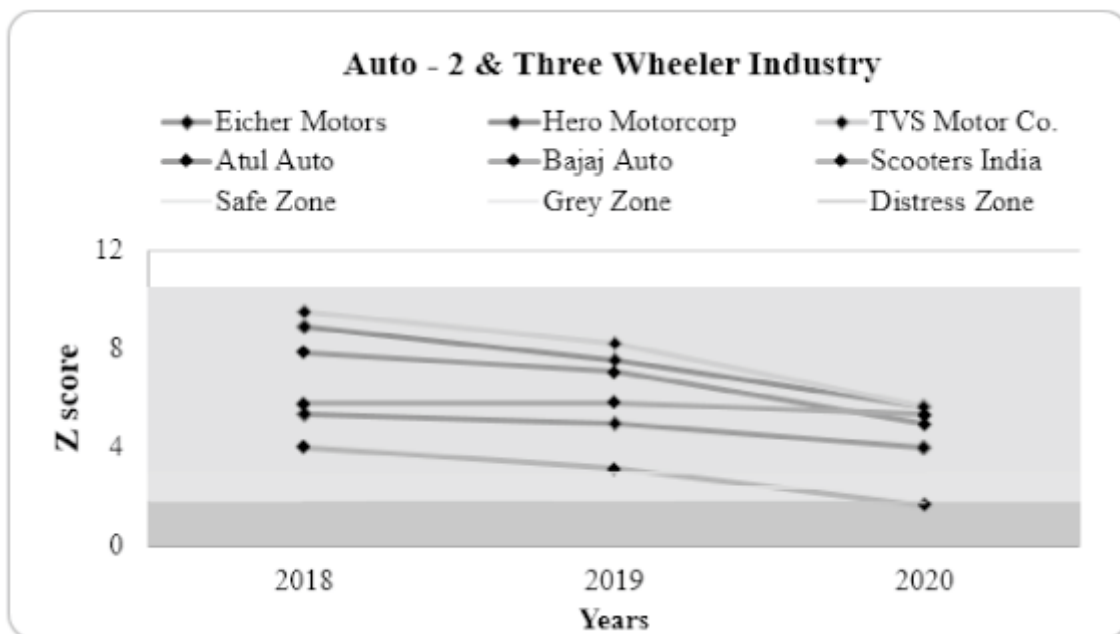


From the chart it is very clear that all three companies of Airlines Industry shows a downward trend. Interglobe aviation's balance sheet is substantially larger than other two companies in same industry. Working capital and retained earnings of Spice Jet and Global Vectra are negative, which is one of the reason

why they show downward trajectory. Main weightage is given to third component in calculation of Z score i.e., Earnings before interest and tax and Interglobe aviation has highest EBIT as compared to other companies so they have better Z score as compared to other two companies.

AUTO – 2 WHEELER AND THREE WHEELER INDUSTRY

Company	2018	2019	2020
Eicher Motors	5.35	4.95	3.96
Hero Motorcorp	8.86	7.55	5.65
TVS Motor Co.	9.51	8.21	5.67
Atul Auto	7.86	7.05	4.95
Bajaj Auto	5.79	5.81	5.34
Scooters India	4.02	3.15	1.69

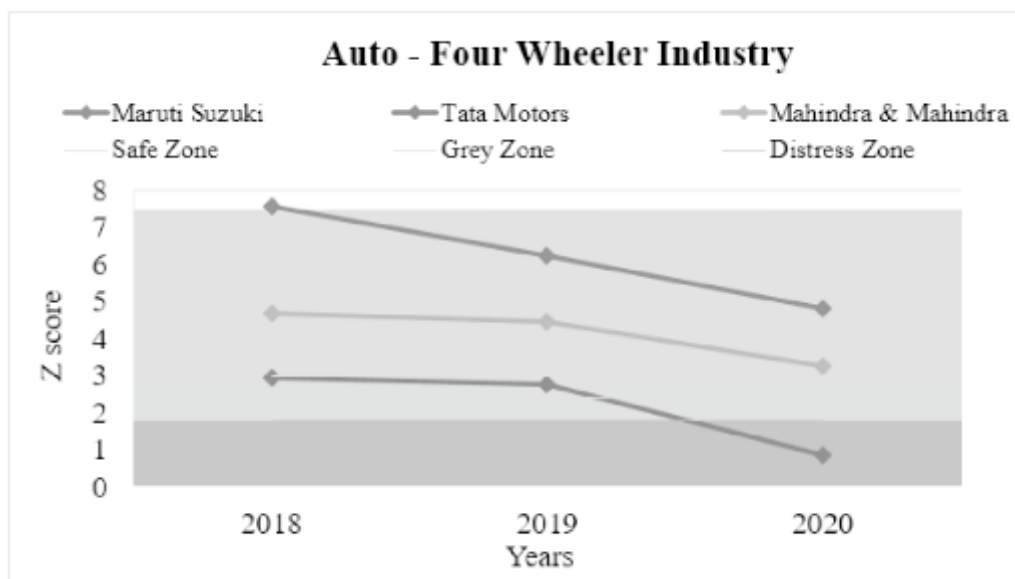


From the above chart, we can say that TVS Motor has best Z score as compared to others. This is because of the components. Balance sheet size of TVS Motors is not largest among all but they have good sales figures, operating profits and retained earnings. Though all the numbers are not the best among all companies but

consistent as compared to others; whereas for Scooters India, balance sheet size is the smallest. They have negative operating profits and retained earnings. Operating profits has the largest weightage and having negative operating profits has led to lower Z score.

AUTO-FOUR WHEELER

Company	2018	2019	2020
Maruti Suzuki	7.57	6.25	4.82
Tata Motors	2.96	2.77	0.83
Mahindra & Mahindra	4.68	4.46	3.27

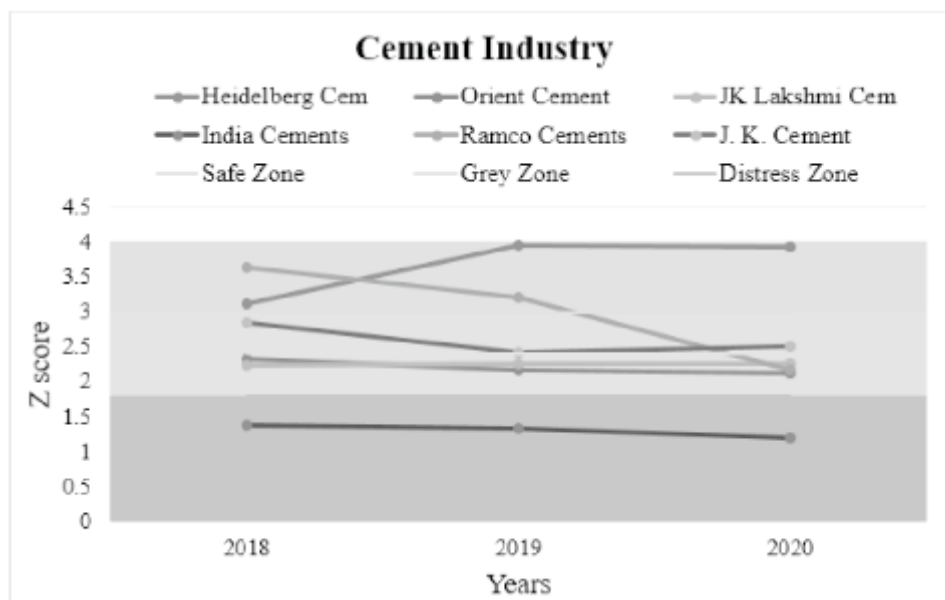


From the above table, it is clear that Z score of Maruti Suzuki is highest among the three companies. Balance Sheet size of all the three companies is almost same. The major difference is due to operating profits i.e. third component which has highest weightage. Maruti Suzuki has the highest operating profit followed by Mahindra & Mahindra, and Tata motors have the negative operating profit. The other component which is making the significant difference is retained

earnings. Maruti Suzuki has highest retained earnings followed by Mahindra & Mahindra, and Tata Motors has negative retained earnings. Though Maruti Suzuki has negative working capital but other components are better which is balancing the negative working capital. Whereas, Tata motors have negative working capital, retained earnings and operating profits which leads lower Z score.

CEMENT INDUSTRY

Companies	2018	2019	2020
Heidelberg Cement	3.13	3.95	3.93
Orient Cement	2.32	2.16	2.13
JK Lakshmi Cement	2.23	2.25	2.27
India Cements	1.38	1.33	1.19
Ramco Cements	3.64	3.21	2.16
J. K. Cement	2.84	2.42	2.51



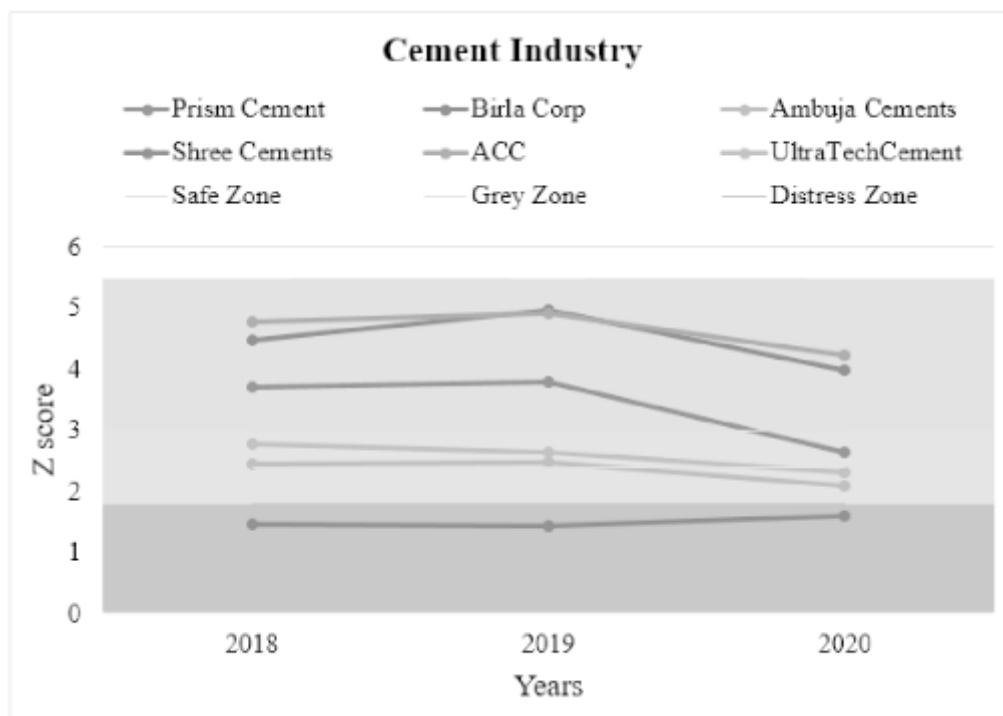
Above chart consists of six companies of Cement Industry. Balance sheet size of all the six companies varies too much. But net sales are almost in same range. Comparing Heidelberg Cement and J.K. Cement, all components of J.K. Cement are more than Heidelberg Cement still Z score of Heidelberg is

higher than J.K. Cement. That is because when all components compared to their respective companies assets, Heidelberg Cement shows better performance than J.K. Cement. This shows that Heidelberg Cement is better at utilizing their assets as compared to J.K. Cement.

Companies	2018	2019	2020
Prism Cement	3.69	3.78	2.64
Birla Corp	1.45	1.43	1.59
Ambuja Cements	2.45	2.47	2.08
Shree Cements	4.46	4.97	3.98
ACC	4.78	4.91	4.22
UltraTechCement	2.77	2.64	2.30

Ramco Cement is showing a downward trajectory, their assets are increasing over the period but their total sales dropped significantly in 2020. Their

operating profits were also decreasing over the period. That's why we see Z score of Ramco Cements falling.



In the chart above, there are more six companies of cement industry. ACC has highest Z score as compared to others. Comparing Shree Cement and Ambuja Cement, balance sheet size and total sales are almost same yet, Z score of Shree cement is more than Ambuja cement. This is because other components like EBIT, working capital and retained earnings of Shree Cement are more in terms of ratio to their assets as compared to Ambuja Cement. That's why Ambuja Cement has low score than Shree Cement inspite of having almost same balance sheet size. This shows that Shree Cement is better in utilizing its assets.

Conclusion

Altman Z score model earlier was just for manufacturing companies but now it is used for companies in different industry too and it is quite reliable too. This model is used in industry too. This paper talks about five Industries, and companies which are listed on NSE from this industry are considered for analysis.

First is FMCG – Personal Care Industry, we can safely conclude that FMCG – Personal Care Industry is consumer facing industry and is doing quite well. It was not affected in pandemic period because of its

nature of consumer facing and falls under essential category. Total 6 companies fall under this industry and all are in safe zone for past 3 years. So we can conclude industry as a whole is doing well and need not fear bankruptcy in medium to long term period.

Second industry in this paper is Airlines Industry, total three companies are listed on NSE. Airlines industry was majorly hampered due to COVID-19. Interglobe Aviation is the safest among the three. But it is heading towards distress Zone due to lockdown. Spice jet was also safe but moving towards distress Zone and lastly Global Vectra which was already distressed suffered more problems due to lockdown.

Third industry is Automobile – 2 & three wheeler Industry in which six companies are listed on NSE. All six companies were in safe zone except Scooter's India which slipped down on the edge of distress zone due to pandemic. All other companies were too hampered but they managed to be in safe zone i.e. Z score more than 3.

Fourth industry is Automobile – four wheeler Industry in which three companies are selected which are listed on NSE. Maruti Suzuki and Mahindra & Mahindra are doing well. Though they were hampered by lockdown

but still managed to be in safe Zone i.e., Z score above 3. Whereas Tata Motors, which was already in Grey Zone and due to lockdown it slipped in distress Zone substantially.

Fifth and last industry taken for analysis is cement industry. Total of twelve companies based on net sales and were divided into two groups of six companies each for better presentation and analysis. Of these twelve only two are in distress Zone and others are in better position. Heidelberg is best as per the Z score. Companies which are in distress Zone are India Cement and Birla Corp. It's not that they have any component negative but they can utilize their available resources in a better way. For Cement industry, it requires more research and can be taken forward from here.

While analyzing companies we usually look into financial statements alone, financial ratios, and valuation ratios. All this parameter will help us to find the current financial status of the company which helps in short term decision making. Along with these parameters if we use Altman Z Score, it will help in predicting near term financial distress and bankruptcy. Because it is of utmost importance to measure the downside risk also due to uncertainties, unpredicted situations such as pandemic, natural calamities, etc. Though we face challenges while calculating Z score because every sector listed companies and an unlisted company has different equation.

There exists an application to directly find the Z score. It was created by Sribatsa Das in New Jersey, United States. But this application does not consider Indian Companies. So it's an opportunity to develop an application for Indian companies too which will help all the stakeholders of that particular company as well as the investors who are looking for investment in those companies.

The paper talks about application of Altman Z score to five industries; this can be used as base for further research in different industry with more number of companies. While analyzing further, unlisted companies can also be considered to get more clearly picture of the industry as whole.

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