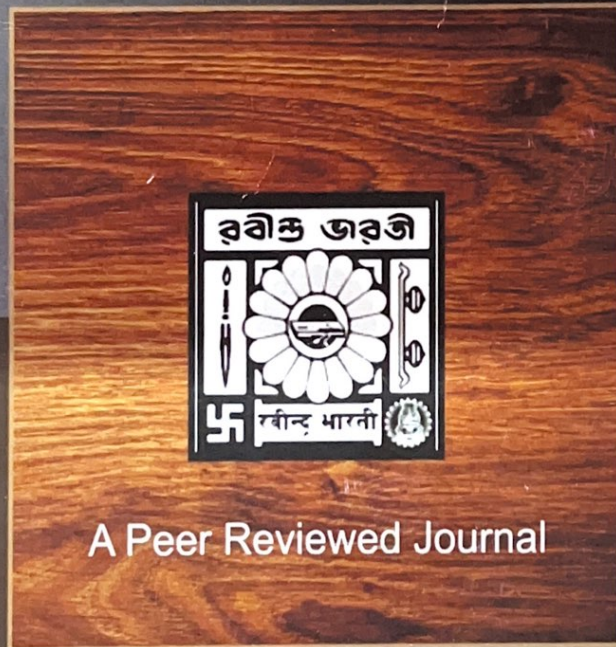


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A STUDY OF PERFORMANCE ANALYSIS OF SELECTED CEMENT COMPANIES USING Z-SCORE MODEL

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ABSTRACT

The financial position of the company depends on the adequate availability of the firms and proper utilization of the funds help the company to progress. Financial Analysis and Financial Statements are the two main tools which can help to plan the future availability and utilization of the firm. The present research report is based on the financial performance analysis of selected Cement companies with the help of Z-Score Model. The Z-Score Model was developed by Edward Altman in 1968. The researcher has used the model to analyze the financial soundness of the selected Cement Companies. Mainly Z-Score helps to analyze in which Zone the Company lies and allows to analyze the solvency status of the company. The present research is based considering the Secondary Data of the companies. The data had been collected from financial statements of the companies and from different websites like moneycontrol.com and rediffmoney.com. In present study the companies from Cement Industry have been considered by the researcher. The companies were selected by Lottery Method by the researcher and the companies considered in present research are Ultratech Cement and J.K. Cement. The researcher has used T-Test to analyze the values of Z- Score of the selected companies. The result shows the significant difference in the Z-Score values of the selected Companies.

KEYWORDS – Financial Performance, Z-Score Model, Financial Analysis

INTRODUCTION

The success of any company depends on effective financial practices which starts from proper procurement of funds and ends by proper utilization of funds, this is possible when the financial activities of the firms are analyzed. Thus, financial planning, financial analysis and financial statements helps the firms to know the strength and weakness of the companies. So, after financial planning, financial analysis is the crucial step for a company to be successful. The main tool for financial analysis is the financial statements of the companies. Financial Analysis is a process, combination and summarization of financial and operational data represented in the financial statements with a view to get an insight into the operational activities of a business concern. As per Helfert Erich A. "The main purpose of financial analysis is to provide reasonable clues and answers to specific questions posed by problems of interest to analyst. It cannot be over emphasized that financial analysis is not an automatic or standardized process, rather it is flexible approach tailored to suit the needs of the specific situations." Financial Statement is an original collection of data arranged according to logical and consistent accounting principles. Financial statements are prepared from the accounting records maintained by the firms. Financial statements are the end products of the financial accounting process.

INTRODUCTION TO Z-SCORE MODEL

Z-Score Model has been established by Edward Altman in the 1960s, he was an assistant professor of finance at New York university during that period. The model was prepared by Altman based on the research work done by considering the data of banks and have provided the bankruptcy model. In his study he considered 22 ratios and finally stated or formed the model considering 5 ratios which help to measure bankruptcy of the firms. This model helps to evaluate the general trend in the financial health of an enterprise over a period. Many accounting ratios are used to know financial health of the enterprise. Edward Altman established Z-Score model, he combined many accounting ratios (liquidity, leverage, activity and profitability) to form an index of profitability. A lower

score of Z-Score Models depicts higher odds of bankruptcy. The model helps to analyze the financial solvency status of the firms and helps to take correct decisions regarding not entering the solvency Zone or Distress Zone, with the help of parameters given by Edward Altman. Edward has developed different Models for Different Business and Firms. The original model was developed further to know the financial soundness and financial solvency status of the private firms.

Model	Parameters	Description
Z- Score Estimated for Private Firms $Z = 0.717 X_1 + 0.847 X_2 + 3.107 X_3 + 0.420 X_4 + 0.998 X_5$	Z > 2.9 Safe Zone	$X_1 = \text{Working Capital} / \text{Total Assets}$
	1.23 < Z < 2.9 Grey Zone	$X_2 = \text{Retained Earnings} / \text{Total Assets}$
	Z < 1.23 Distress Zone	$X_3 = \text{Earnings Before Interest and Tax} / \text{Total Assets}$ $X_4 = \text{Book Value of Equity} / \text{Total Liabilities}$ $X_5 = \text{Sales} / \text{Total Assets}$

IMPORTANCE OF Z-SCORE MODEL

- The model helps to check the financial solvency of the firms.
- It is important as weightage is given to each factor considered in the Model.
- Different weightage helps to analyze the importance of the factors that will create more impact in improving the ratio which highly affects the financial soundness of the company.
- It helps to compare the financial performance with traditionally calculated ratios by the firm.
- With proper parameters it helps the company to interpret the current and the past Zone in which the company lies.
- Traditionally calculated ratios do not show the financial solvency status of the company while Z-Score Model helps the company to know the financial solvency status of the company.

REVIEW OF LITERATURE

Altman, E. (1968) has studied the theory of Traditional Ratio Analysis and Multiple Discriminant Analysis with the help of this method the researcher has developed Z-Score Model combining the ratios. The researcher has taken into consideration 66 corporations with 33 firms in each group. The researcher has analyzed the several factors which affect the firms. To measure the financial soundness the researcher has derived Z-Score Model. The researcher has reached the conclusion that discriminant ratio model proved to be accurate in predicting bankruptcy perfect in 94% of the sample of 1st 33 units and 95% of all firms in the bankrupt and non-bankrupt groups assigned to their actual group classification. The researcher also suggested the practical and theoretical implications of model. The researcher also told that the subject need to further researched and investigate the problems and even the model.

Pakdaman, H. (2018), the researcher in the paper titled "Investigating the ability of Altman and Springate and Zmijewski and Grover Bankruptcy Prediction Models in Tehran Stock Exchange" has researched with a motive to know which prediction model among Altman, Springate, Zmijewski or Grover will be best to predict the financial conditions of the companies listed in Tehran Stock Exchange. The researcher even wanted to know the financial status of the company and issue of the continuity of their activities. The research was also undertaken so that it

can help the stakeholders to take better decisions. The researcher has taken into consideration the data of 35 companies from textile and ceramic industry group which have been listed on the Tehran Stock Exchange. The researcher has taken into consideration the data of 5 years to study and find the results which test will be best to prove the financial crises of the company. The researcher has considered the time period between 2011-2016 for the study. The researcher has collected the data from the financial statements of the company. The researcher has framed 8 hypotheses to further know which model can help to predict the financial crises of the companies. The researcher has used Correlation test to examine the significance of each bankruptcy Model and further have used multiple Linear Regression to find out the best fit Model. The researcher found that Grover Model was the best Model for forecasting financial crises in Tehran Stock Exchange. The researcher also suggested that Stock Exchange should be organized in order to provide the data as per Grover Bankruptcy Pattern and even auditors can use this model in predicting and commenting for the future continuity of the companies listed on Tehran Stock Exchange.

Panigrahi, A. (2019) the researcher in the paper titled "Validity of Altman Z Score Model is predicting financial distress of Pharmaceutical Companies" aims to examine the financial distress status and financial health of some selected pharmaceutical companies using Altman Z- Score Model. The researcher has taken into consideration the data of 4 pharmaceutical companies for the study i.e. Aurobindo Pharma, Lupin Pharma, Dr. Reddy's Laboratories and Sun Pharma. The researcher has taken the data of 5 years for the study i.e. 2012-13 to 2016-17. The researcher has collected the data from annual reports and from the website moneycontrol.com. The researcher has used Z-Score Model to analyze the data. The researcher has done calculations as per Altman's Z-Score test for solvency Analysis. The researcher has even calculated average of the industry calculating upon 5 ratios that are considered in Z-Score Model. The researcher has calculated the average Z-Score of the pharmaceutical industry which shows that pharmaceutical industry is financially sound. The researcher also concluded saying that the highest average was of Dr. Reddy's followed by Lupin Pharma, Sun Pharma and lastly Aurobindo Pharma. The researcher also concluded that study shows Aurobindo Pharma was found in Distress Zone in 2013-14 than probably they were able to reach the safe zone by 2016-17. The researcher has also said that this research would be helpful to investors in making certain decisions on which they can decide the current and future position of the company. The researcher in the concluding remarks added that if the risk of default and bankruptcy increases when a firm adopts more aggressive working capital policies which shows that company may be facing bankruptcy and serious financial crisis.

Yadav, C. and Pallapothu, V. (2015) the researcher in the paper titled "Predicting Bankruptcy: An Empirical Study Using Multiple Discriminant Analysis Models" have researched on predicting the best MDA model which accurately predicts the bankruptcy. The researcher has analyzed the data using 2 MDA models – Altman Z-Score Model and Springate Model. The researcher also aims to find and help the users to make the right choice among the model to find the solvency status of the companies. The research was also undertaken with an objective to the analyze the dimension and to get an idea in which area improvement is needed. The researcher also wanted to find out whether healthy companies are performing significantly as compared to non-healthy companies using statistical tools. The researcher has considered a sample of 45 companies for the study. The researcher has collected the data from the financial statements of the companies. The researcher has considered the data of 5 years for the study. The researcher has used T-test to analyze the data. The researcher has performed T-Test on the values of Z-Score and Springate Score of healthy and Distress companies. The researcher concluded that Altman Z-Score is more conservative in nature.

Objectives of Present Research Paper

- 1) To know the financial strength of the selected companies using Z-Score
- 2) To compare the performance of Selected Sample units by comparing Z-Score

Hypothesis of the study

The following Hypothesis were formulated for the study.

H_0 – There is no significant difference in the variances.
 H_0 – There is no significant difference in Z-Score of Ultratech Cement and J.K.Cement

RESEARCH METHODOLOGY

To carry out the research work properly and systematically, it is necessary to prepare a research methodology first. In present research paper, following research methodology is used.

Title of the Study

The title of the study is as under
 “A study of performance analysis of selected cement companies using Z-Score model.”

Sample Size

The study is undertaken by considering the data of different companies associated with Cement Industry. The researcher has taken into consideration different companies associated with Cement Industry. The study includes Ultratech Cement and J.K. Cement

Method of Data Collection

The researcher has used secondary data for the analysis. The details of different ratios are taken from www.moneycontrol.com. The details have been collected from the Annual Reports of the company. The researcher has considered the data of last 5 years for the study from 2016 to 2020.

Tools and Techniques

The researcher has used statistical tools for analysis and interpretation of calculated Z-Score of 2 Cement companies. The researcher has used T-Test to analyze the difference and to test the hypothesis.

Limitations of Present Research Paper

The main limitations of the present research project are.

- 1) The method of data collection is secondary, so the analysis has been done from the data that has been available in the financial statements of the company.
- 2) The data has been collected for 5 years only so the result is not applicable for coming years.
- 3) The outcomes are only available for the above companies and not the other companies.

Analysis and Interpretation
Z-SCORE ANALYSIS

TABLE – 1

A table showing calculation of Z-Score of Ultratech Cement

Z Score = 0.717X ₁ +0.847X ₂ +3.107X ₃ + 0.420X ₄ + 0.998X ₅						
Year	0.717X ₁	0.847X ₂	3.107X ₃	0.420X ₄	0.998X ₅	Z Score
2020	0.0045	0.4481	0.2997	0.0036	0.5566	1.3125
2019	-0.0199	0.3379	0.2307	0.0032	0.5657	1.1176
2018	-0.0060	0.3995	0.2564	0.0040	0.5553	1.2093
2017	0.0806	0.5103	0.3438	0.0075	0.6831	1.6253
2016	-0.0382	0.4779	0.2923	0.0067	0.7138	1.4525

TABLE – 2

A table showing calculation of Z-Score of J.K.Cement

Z Score = 0.717X ₁ +0.847X ₂ +3.107X ₃ + 0.420X ₄ + 0.998X ₅						
Year	0.717X ₁	0.847X ₂	3.107X ₃	0.420X ₄	0.998X ₅	Z Score

2020	0.0453	0.3290	0.3457	0.0068	0.6858	1.4127
2019	0.0474	0.3432	0.3108	0.0080	0.7067	1.4161
2018	0.0482	0.2941	0.3553	0.0076	0.7858	1.4910
2017	0.0268	0.2614	0.3136	0.0074	0.7401	1.3493
2016	0.0429	0.2452	0.2254	0.0073	0.7201	1.2410

Table – 3

A Table Showing Overall Interpretation of Z- Score

Year	2020	2019	2018	2017	2016
Ultratech Cement	1.3125 (Grey Zone)	1.1176 (Distress Zone)	1.2093 (Distress Zone)	1.6253 (Grey Zone)	1.4525 (Grey Zone)
J.K. Cement	1.4127 (Grey Zone)	1.4161 (Grey Zone)	1.4910 (Grey Zone)	1.3493 (Grey Zone)	1.2410 (Grey Zone)

DESCRIPTIVE ANALYSIS

Table – 4

A Table showing Descriptive Statistics.

COMPANY		N	Mean	Std. Deviation	Std. Error Mean
Z-SCORE	Ultratech	5	1.3434	0.20081	0.08980
	Cement				
	J.K.Cement	5	1.3820	0.09346	0.04180

The above table 4 shows the mean, standard deviation, standard Errors Z-Score values of the selected Cement Companies. The Table shows different means of the companies based on the Z-Score calculated by the researcher, among the 2 selected companies J.K. Cement shows the highest mean as compared to Ultratech Cement.

STATISTICAL ANALYSIS

Table – 5

A Table showing results of T-Test.

		Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F	3.029	
	Sig.	0.120	
T-test for Equality of Means	T	-0.389	-0.389
	Degree of freedom	8	5.655
	Sig(2-tailed)	.707	.711
	Mean Difference	-0.03858	-0.03858
	Std.Error Difference	0.09905	0.09905
Interval	Lower	-0.267	-0.2845
	Upper	0.1898	0.2704

H₀ – There is no significant difference in the variances.

To check the equality of variances the researcher has used Levene's Test for Equality of Variances. As the F-Value is more than significant value, it shows that hypothesis is Accepted. As the hypothesis is accepted researcher has used the result of equal variances assumed for checking the result of another hypothesis.

H₀ – There is no significant difference in Z-Score of Ultratech Cement and J.K Cement.

As per the Levene's test for equality, the result shows no significant difference in the variances. Further results of T-test show significant value is more than T-Test, so the hypothesis is accepted. So, the result of T-test shows that there is no significant difference among the Z-Score of Ultratech Cement and J.K. Cement.

MAJOR FINDINGS

- From the present study the researcher found that among the 2 selected companies both companies lie in grey zone.
- It was found by the researcher that both companies are financially sound.

CONCLUSION

From the present research work we can conclude that there lies no difference in the Z-Score of the companies. Mainly it was found that as Ultratech Cement went into Distress Zone in 2018 and 2019 so due to what it might have happened and again the company was successful in entering the grey zone. So, both the companies should try to be in the safe Zone so that no chance of Bankruptcy can arrive.

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