JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

"A COMPARATIVE STUDY OF FINANCIAL PERFORMANCE OF SELECTED CEMENT COMPANIES IN INDIA THROUGH 'Z' SCORE MODEL"

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Abstract

Most of the users like shareholders, government, bankers, creditors, financial institutions etc. awareness on the fulfillment and solvency position of the business enterprise with whom they're dealing. Absolute figures presented in financial statements and accounts do no longer serve this object. As there are numerous accounting tools like ratio analysis, decision theory etc. used for analysis however again they suggests absolute result thru which the present position can be judged now not the future. Edward I. Altman, Professor of Finance at New York University was the first person who developed a model known as "Z-score Model" to know the financial performance of the business concerns. He considered five ratios and assigned a weight for every ratio and produced one number which indicates the financial performance of the business concerns. In the present research paper an attempt is made to predict the financial performance of Cement Industry with special reference to JK Cement, JK Laxmi Cement and Ambuja Cement from 2009-2010 to 2018-2019 for 10 years the usage of Altman's Z-score model. It is found out that JK cement and JK Lakshmi Cement are in too performance Distress Zones where it is fall bankrupt. The failure in this situation

is uncertain to expect. Ambuja Cement is Safe Zones where it is successful in its financial performance and not to fall bankrupt.

KEY WORDS: Financial performance, JK Cement, JK Laxmi Cement, Ambuja Cement, Z-score Model, Net Working Capital to Total Assets Ratio, Retained earnings to total assets ratio, Earnings before Interest and Tax (EBIT) To Total Assets Ratio, Market value of equity to Book value of total liabilities ratio, Sales to total assets ratio, Safe Zones, Grey Zones, Distress Zones.

1 INTRODUCTION:

One of the imperative tasks of a business is to prepare the financial statements. Financial Statements of a business organization serve several purposes for various categories of parties. These parties are usually referred to as the stake holders. These stake holders can be categorized into two viz., Internal Stake holders and External Stake holders. Internal Stake holders includes executives, managers, employees and workers, whereas External Stake holders includes investors, creditors, government agencies, non-governmental organizations, banks, financial institutions and society as a whole. These stake holders are often concerned with knowing the financial health of the business. The internal stake holders are interested in financial health because they are concerned with the salaries and perks. External stake holders are interested in financial health because they are concerned with the return and repayment of their credit and service that can be received from the business.

So, according to their purposes, the stake holders like to make the analysis of financial statements of the business organization. On the basis of their analysis, they derive certain conclusions about the financial health of the organization. The stake holders can use various tools for making the analysis of financial health of the business, but out of the various tools Ratio analysis is widely used because of its ease and accuracy in predicting the financial health. One of such tools is Z-Score.

2 Z SCORE MODEL- AN INTRODUCTION:

As of now it is quite clear that there are several tools available for making the analysis of financial statements of the business and ratio analysis is the widely used tool. But ratio analysis is also suffering from certain weaknesses. In order to remove these weaknesses, Willian H. Beaver developed a tool in 1967. He selected 5 ratios (Cash-flow to total debt, net income to total asset, total debt to total asset, net working capital to total asset, current assets to current liabilities) out of 30 ratios to study the financial health. He took the sample of seventy nine successful and seventy nine unsuccessful business gadgets. He applied these ratios to the sample units in order to judge their financial health.

Beaver's analysis was univariate analysis. Hence, it focused on the single dimension of the financial health of the organization. In order to remove this weakness, "Altman's Z-Score Model" was developed by Prof. Edward I. Altman, Professor of Finance, New York University, developed "Multiple Discriminant

Analysis". In order to prove this model, Altman took a sample of 66 business units out of which 33 were bankrupt and other 33 were non-bankrupt. He proved that the Z-Scores of the bankrupt units were lower than those of non-bankrupts. On the basis of this analysis he set the standards for identifying distressed, grey and safe zones for business's financial health.

Z-score model is a success in predicting the economic fitness of the corporation. Now it is internationally recognized model. It was published first in September, 1968 in Journal of Finance, titled as "Financial Ratio, Discriminant Analysis and the Prediction of Corporate Bankruptcy". Rather than searching for single best ratio professor Edward Altman has introduced new model in 1968 called Altman Z-score model. The Z-score method is used for predicting liquidity function and monetary economist. The Z-rating is multivariate formulation that measures the economic overall performance of the employer and are expecting the financial ruin within two years. The model covers both the problems, financial problems and working problems. The model uses 5 ratios symbolically X1, X2, X3 X4 and X5. The ratios are follows:

(1) **X1**= Working Capital / Total Assets,

(2) **X2=** Retained Earning / Total Assets,

(3) **X3=** EBIT / Total Assets,

(4) **X4=** Market Price of Equity / Total Liability,

(5) **X5=** Net Sales / Total Assets.

Z score is a tool which is widely used to check the financial health of the business. This model is used by the analysts all over the world.

The Z-rating have gained acceptance via auditor's management accountants, courts and information base machine for assessment. It's been utilized in kind of context and countries but turned into designed originally for publicly held production agencies.

Name	Model
Z-score	1.2.X1 + 1.4.X2 + 3.3.X3 + 0.6.X4 + 0.999.X5

(Source: https://www.creditguru.com/index.php/bankruptcy-and-insolvency/altman-z-score-insolvency-predictor)

The latter two equations are often mentioned to as Altman model for Manufacturing Companies zones of discrimination are as follows:

Zones	Z Score	Remarks
Safe Zones	**Above 2.99**	It is good financial performance.
Grey Zones	**1.81 - 2.99**	Financial viability is considered to be performance. The failure in this situation is uncertain to expect.

Distress Zones	**Below 1.81**	Its failure is certain and would occur probably within a period of two years

3 METHODOLOGY:

3.1 OBJECTIVES OF THE STUDY:

- To review the financial result with Altman Z Score model.
- To review the comparative financial performance of selected cement companies.
- To make analysis and suggestions for the improvement of selected sample.

3.2 SELECTION OF SAMPLE:

For the present study, the researcher has selected 3 cement Companies, randomly, using lottery method. The selected companies under sample are JK Cement, JK Lakshmi Cement and Ambuja Cement.

3.3 PERIOD OF THE STUDY:

To check the financial position and consistency in the performance, Z-Score is performed on the data of last 10 financial year's viz. 2009-10 to 2018-19.

3.4 DATA COLLECTION:

The study is based on secondary sources of data and the researcher has collected the data from the published annual reports of the selected sample companies.

4 DATA ANALYSIS:

Table 5 Z score ratios of J. K. Cement Ltd.

Ratio/Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
X_1	0.1102	0.1585	0.0969	0.0336	-0.7467	-0.7417	0.0198	0.0373	0.0636	0.0694
X_2	0.0596	0.014	0.0381	0.0462	0.0142	0.023	0.0125	0.0387	0.0458	0.0346
X_3	0.1282	0.0584	0.1187	0.122	0.0625	0.0787	0.0735	0.1014	0.1134	0.0991
X_4	0.837	0.6988	0.7453	0.7699	0.2354	0.2079	0.4363	0.4903	0.5597	0.7126
X_5	0.6154	0.6139	0.8111	0.6504	0.5451	0.624	0.7363	0.7415	0.787	0.7075

Table 6 Z score of J. K. Cement Ltd.

Score/ Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Avg.
X1*1.2	0.1322	0.1902	0.1162	0.0403	-0.896	-0.89	0.0237	0.0447	0.0763	0.0832	
X2*1.4	0.0834	0.0196	0.0533	0.0646	0.0198	0.0322	0.0175	0.0541	0.0641	0.0484	
X3*3.3	0.423	0.1927	0.3917	0.4026	0.2062	0.2597	0.2425	0.3346	0.3742	0.327	
X4*0.6	0.5022	0.4192	0.4471	0.4619	0.1412	0.1247	0.2617	0.2941	0.3358	0.4275	
X5*0.999	0.6147	0.6132	0.8102	0.6497	0.5445	0.6233	0.7355	0.7407	0.7862	0.7067	
Z Score	**1.7555**	**1.4349**	**1.8185**	**1.6191**	**0.0157**	**0.1499**	**1.2809**	**1.4682**	**1.6366**	**1.5928**	**1.27721**
Zones	DZ	DZ	GZ	DZ	DZ	DZ	DZ	DZ	DZ	DZ	**DZ**

Analysis:

Table No. 5 exhibits analysis of ratios of J. K. Cement Ltd. using Altman Model. The working capital to total assets ratio was ranges between -0.7417 to 0.1585. In years 2009-10 to 2018-19, working capital to total assets ratio shows moderate level investment. Negative working capital ratio it means it is a serious problem for firm and low level of investments in current assets which was shows the weak liquidity position of the company. Retained earnings to total assets shows the low retained earnings to total assets are financing capital expenditure through borrowing rather than through retained earnings. The ratio of EBIT to total assets varies between 0.122 to 0.1282 during the study period. The policy of long-term finances and leverages less or more basis of influence to creation of value for stakeholder of company. The soundness of such policy is judge by value of equity to total liability ratio. Up to the 2012-13, value of equity higher compared to total liability, but after that higher for rest of the year under study period. Sales to total assets was decreased only 2 years i.e. 2014-15 and 2017-18 and in remain years, it was not nearby 1. It shows the company has not taken appropriate steps to utilize of its assets in generating more and more sales revenue.

Table 7 Z – score ratios of JK Lakshmi Cement Ltd.

Ratio/Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
X_1	0.1292	0.0739	0.0869	-0.0003	-0.0059	-0.0847	-0.0997	-0.0716	-0.0714	-0.0834
X_2	0.0858	0.0202	0.0291	0.045	0.0183	0.0164	-0.0085	0.0171	0.0163	0.0154
X_3	0.1597	0.0533	0.0823	0.10125	0.0538	0.0492	0.0354	0.0569	0.0664	0.0651
X_4	0.7448	0.7016	0.7297	0.6687	0.5758	0.4827	0.465	0.4315	0.4787	0.5191
X_5	0.6233	0.5197	0.6167	0.6536	0.5766	0.5644	0.7154	0.7112	0.7828	0.8713

Table 8 Z score of JK Lakshmi Cement Ltd.

Score/ Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Avg.
X1*1.2	0.155	0.0886	0.1042	-0.0003	-0.007	-0.1016	-0.1196	-0.0859	-0.0856	-0.1	
X2*1.4	0.1201	0.0282	0.0407	0.063	0.0256	0.0229	-0.0119	0.0239	0.0228	0.0215	
X3*3.3	0.527	0.1758	0.2715	0.3341	0.1775	0.1623	0.1168	0.1877	0.2191	0.2148	
X4*0.6	0.4468	0.4209	0.4378	0.4012	0.3454	0.2896	0.279	0.2589	0.2872	0.3114	
X5*0.999	0.6226	0.5191	0.616	0.6529	0.576	0.5638	0.7146	0.7104	0.782	0.8704	
Z Score	**1.8715**	**1.2326**	**1.4702**	**1.4509**	**1.1175**	**0.937**	**0.9789**	**1.095**	**1.2255**	**1.3181**	**1.26972**
Zones	GZ	DZ	DZ	DZ	DZ	DZ	DZ	DZ	DZ	DZ	**DZ**

Analysis:

Table No.7 show the ratios analysis related to Altman model of JK Lakshmi Cement Ltd. The working capital to total assets ratio was ranges between -0.0003 to 0.1292. In years 2009-10 to 2018-19. the ratio was negative so it indicating working capital to total assets ratio shows moderate level investment. The ratio of retained earnings to total assets shows the how much portion of total assets has been financed by retained earnings. In the year 2009-10, this ratio was higher related to EBIT. This shows the higher financial condition of the company at times of poor profitability period. EBIT to total assets was good in the year 2009-10 and 2012-13 i.e. 0.1597 and 0.10125 respectively. The company having 1:1 equity to total liability is good condition. The ratio of value of equity to total liability varies between 0.465 to 0.7448 during the study period. Sales are a very important component for all the parties. Sales to total assets ratio vestige the power of the assets in generating the sales. This ratio ranges from 0.5197 to 0.8713 during the period of study.

Table 9 Z – score ratios of Ambuja Cement

Ratio/Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
X_1	0.0646	0.1098	0.193	0.2077	0.2055	0.2346	0.0334	0.0558	0.0803	0.0889
X_2	0.0698	0.0638	0.059	0.0499	0.0413	0.02	0.0121	0.0249	0.0411	0.0443
X_3	0.1493	0.1701	0.1606	0.1218	0.1329	0.0892	0.0579	0.07	0.0629	0.0751
X_4	2.4514	2.3823	2.5099	2.7264	2.6605	2.6735	4.8441	4.3008	5.0339	4.64
X_5	0.645	0.825	0.7857	0.7008	0.7129	0.6615	0.4448	0.4472	0.4358	0.4206

Table 10 Z score of Ambuja Cement

Score/ Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Avg.
X1*1.2	0.0775	0.1317	0.2316	0.2492	0.2466	0.2815	0.04	0.0669	0.0963	0.1066	
X2*1.4	0.0977	0.0893	0.0826	0.0698	0.0578	0.028	0.0169	0.0348	0.0575	0.062	
X3*3.3	0.4926	0.5613	0.5299	0.4019	0.4385	0.2943	0.191	0.231	0.2075	0.2478	
X4*0.6	1.4708	1.4293	1.5059	1.6358	1.5963	1.6041	2.9064	2.5804	3.0203	2.784	
X5*0.999	0.6443	0.8241	0.7849	0.7	0.7121	0.6608	0.4443	0.4467	0.4353	0.4201	
Z Score	**2.7829**	**3.0357**	**3.1349**	**3.0567**	**3.0513**	**2.8687**	**3.5986**	**3.3598**	**3.8169**	**3.6205**	**3.2326**
Zones	GZ	SZ	SZ	SZ	SZ	GZ	SZ	SZ	SZ	SZ	**SZ**

Analysis:

Table No.9 exhibits the ratios analysis of Ambuja Cement which is used to Altman model. The adequate working capital shows liquidity position of company which ids judge through working capital to total assets. The working capital to total assets of Ambuja Cement was varies in between 0.193 to 0.2077 under study period. In Ambuja Cement retained earnings to total assets was higher between 2009-10 to 2010-11 which good to used such source of finance with downward trend in profitability. The EBIT to total assets indicates performance of operating activity of company and assets productivity. It varies during the period of the study, it is highest in the year 2009-10 i.e. 0.1493.Value of equity to total liability line highly fluctuate during study period. Sales to total assets shows the sale was decline from 2014-15 because poor financial management of the company to utilize of its assets in generating sales revenue**.**

Table 10 comparative Z score of Cement companies

Year /Companies	JK Cement	JKL Cement	Ambuja Cement
2009-10	1.7555 **DZ**	1.8715 **GZ**	2.7829 **GZ**
2010-11	1.4349 **DZ**	1.2326 **DZ**	**3.0357 SZ**
2011-12	1.8185 **GZ**	**1.4702 DZ**	**3.1349 SZ**
2012-13	1.6191 **DZ**	**1.4509 DZ**	**3.0567 SZ**
2013-14	0.0157 **DZ**	**1.1175 DZ**	**3.0513 SZ**
2014-15	0.1499 **DZ**	**0.937 DZ**	**2.8687 GZ**
2015-16	1.2809 **DZ**	0.9789 **DZ**	**3.5986 SZ**

2016-17	1.4682 **DZ**	1.095 **DZ**	3.3598 **SZ**
2017-18	1.6366 **DZ**	1.2255 **DZ**	3.8169 **SZ**
2018-19	1.5928 **DZ**	1.3181 **DZ**	3.6205 **SZ**
Avg.	**1.2772 DZ**	**1.2697 DZ**	**3.2326 SZ**

(Note: SZ = **S**afe **Z**ones, **GZ** = **G**rey **Z**ones and **DZ** = **D**istress **Z**ones.)

TESTING OF HYPOTHESIS:

Null Hypothesis (H_0):

There is no significant difference in the Z-Score performance indicator in selected Cement Companies during the period of study.

ANOVA Table

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	2.73	9	0.30	1.93	0.11	2.456
Columns	25.58	2	12.79	81.29	9.71	3.55
Error	2.83	18	0.15			
Total	31.15	29				

5 CONCLUSION:

Thus, on the basis of the analysis, the researcher has concluded about the selected cement companies which shows the overall growth. For the analysis the researcher uses Z-score Model. An individual company has analyzed to know solvency position. The safe zone, gray zone and distress zone are three zone use to prediction of bankruptcy of Cement companies. Ambuja Cement shows the overall sound situation as compared to other two companies, as it is in the safe zone and gray zone.

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