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A study on Financial Health of Indian Cement Industry: 'Z' – Score Approach"

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Abstract

The study verify validity of Altman's Z score model and identify trend in top five cement industry in India according to financial health. For this we are taking period of five years from 2008 to 2012 has been calculated using ratio analysis. It has been found that Altman's Z score model is appropriate predicator for current position of top five cement industry. In this context, Altman Z-score plays an important role in judging the financial soundness of the company. The present study was conducted to study, analyze and compare the financial conditions of the sample companies. The study, on an overall basis, revealed that among all the sample companies ACC cement, Ambuja cement, India cement, Birla cement and UltraTech cement were financially sound during the study period.

Key word: Altman's Z score model, predicator, financial soundness, financial health

Introduction of the Study

Research topic:

"A study on Financial Health of Indian Cement Industry:

'Z' – Score Approach"

The Indian industry was exposed to large scale domestic and international competition following her economic liberation in 1992. While few firms were able to take up the challenge, a large number of firms were affected by the competition. The level of nonperforming assets of Indian companies has increased several times during this period. The detection of companies operating and financial difficulties is the subject which

has been particularly willing to analysis with financial ratios. Though at one extreme, many learned academicians questions the viability of financial distress prediction models using financial ratios. However there is continuing interest in refining and testing financial distress prediction models. Beaver initiated the interest of academic world to the financial distress prediction model using university analysis methodologies for classifying bankruptcy and non bankruptcy firms. The importance of subject attracted the interest of several author from countries.

In September 1968, the journal of finance published a paper author by EDWARD I. ALTMAN that introduced the world to the Altman Z-score, a technique designed to predict corporate bankruptcy over the past 40 year, scores of academics and practitioners have put the Z-score to test under a wide range of industry and economic environment. During that same time, many new methodologies were put forth that challenged the Z-score as the premier indicator of corporate distress. However, few, if any, came close to the accuracy of the Z score as a predictor of corporate default with in 2 year time horizon. Indeed, the Altman Z score has stood the test of time while undergoing the rigor of academic scrutiny and has secured its place in corporate finance history. First developed in 1968, Altman's primary improvement over prior methods was to apply discriminate analysis which simultaneously took in to account multiple variables to ascertain financial strength. As an open system, users enjoy the benefits without the additional cost incurred with the proprietary black box systems. No hidden magic – only solid financial analysis. The Z score has continued to evolve over time with new versions developed specifically for private companies. Its gained wide acceptance from auditors, management accountant, courts and data base systems used for loan evaluation. The formula's approach has been used in a variety of contexts and countries. Forty years of scrutiny speaks to its validity. The method examines liquidity, profitability, reinvested earnings and leverage which are integrated in to a single composites score. It can be used with past, current or projected data as it requires no external inputs such as GDP or market price.

The Z-score is a linear combination of four or five common business ratios, weighted by coefficients. The coefficients were estimated by identifying a set of firms which had declared bankruptcy and then collecting a matched sample of firms which had survived, with matching by industry and approximate size (assets).

Altman applied the statistical method of discriminate analysis to a dataset of publicly held manufacturers. The estimation was originally based on data from publicly held manufacturers, but has since been re-estimated based on other datasets for private manufacturing, non-manufacturing and service companies.

The original data sample consisted of 66 firms, half of which had filed for bankruptcy under Chapter 7. All businesses in the database were manufacturers and small firms with assets of <$1 million were eliminated.

The original Z-score formula was as follows:

$$\mathbf{Z = 0.012\ X_1 + 0.014\ X2 + 0.033\ X_3 + 0.006\ X_4 + 0.999\ X_5.}$$

TABLE-A

Financial Ratio	**Co-efficient of the ratio**
Networking capital to total assets (X1)	0.012
Retained earnings to total assets (X2)	0.014
EBIT to total assets (X3)	0.033
Market value of equity to total liabilities (X4)	0.006
Net sales to total assets (X5)	0.0999

X1 indicate the liquid assets in relation to the size of the company.

X2 indicates profitability in relation to the size of the company

X3 indicates the operating efficiency apart from tax and leveraging factors

X4 indicates the long term solvency of the company

X5 indicates the sales generating capacity of the company (varies greatly from industry to industry).

TABLE-B

Score	Interpretation
Above 3	The company is financially safe
2.77-2.99	The company is on alert to exercise the caution
1.8-2..00	There are chances that the company could go bankrupt in next 2 years
Below 1.8	The company's financial position is embarrassing

Z-score estimated for private firms

$Z' = 0.717\ \mathbf{x_1} + 0.847\ \mathbf{x_2} + 3.107\ \mathbf{x_3} + 0.420\ \mathbf{x_4} + 0.998\ \mathbf{x_5}$

Where:

X1 = (Current Assets − Current Liabilities) / Total Assets

X2 = Retained Earnings / Total Assets

X3 = Earnings Before Interest and Taxes / Total Assets

X4 = Book Value of Equity / Total Liabilities

X5 = Sales/ Total Assets

Z-scores are used to predict corporate defaults and an easy-to-calculate control measure for the financial distress status of companies in academic studies. The Z-score uses multiple corporate income and balance sheet values to measure the financial health of a company

Altman's Z-Score Models

Coefficients Variables	Original Model (1968)	Revised Model (1983)	Re-revised Model (1993)
X1	1.21	0.717	6.56
X2	1.41	0.847	3.26
X3	3.30	3.107	6.62
X4	0.60	0.42	1.05
X5	0.999	0.998	N/A
Cut off scores	<1.81	<1.23	>1.10
Bankrupt Firms	>2.67	>2.90	>2.60
Non Bankrupt Firms Grey Area	1.81 – 2.67	1.23 – 2.90	1.10.- 2.60

Literature review

Though there are innumerable studies available on the subject, the most appropriate studies have been revived. Altman used multiple discriminate analyses (MDS) in his effort to find out bankruptcy prediction model. He selected 33 publicly traded manufacturing bankrupt companies between 1946 and 1965 and matched them to 33 firms on a random basis. The result of the MDS exercise yielded equations called Z- score that correctly classified 94% of the bankrupt companies and 97% of the non- bankrupt companies a year prior to bankruptcy. This percentage dropped when trying to predict bankruptcy two or more years before it occurred. The ratios used in Altman model are working capital over total assets, retained earnings over total assets, earnings before interest, taxes over total assets market, value of equity over book value of total liabilities and sales over total assets.

Altman in this topic discussed two of the primary motivating influences on the recent developments of credit scoring models, the important implications of base, its proposed capital requirement on credit requirement on credit assets and enormous amount and rate of defaults and bankruptcies in USA in 2001-02. Two of the more prominent credit scoring techniques of Z- score and KMV's EDF models are reviewed. Both models are assed with respect to default probability in general.

Altman Z- score emphasized in his article that accrual accounting ratios were shown to predict bankruptcy accurately for manufacturing industries. Such financial ratios usually lack theoretical justification. Since bankruptcy is a cash oriented phenomena, the use of variable based on cash flows is theoretically appealing. Statistics shows that more than 300 companies go out of business every week. The high rate of bankruptcy is attributed to the combined effect of fierce competition in the market place and heavier debt burdens carried by the companies. While few firms were affected by the challenges, a large number of firms were affected by the competition. Gupta attempted a Beavers method with an objective of building a forewarning system of corporate sickness. A sample non-parametric test for measuring the relative diffentiating power of various financial ratios was used. The study, among 728 textile and non textile group of industries, revealed that earnings before depreciation interest and taxes to sales and operating

Cash flows to sales at higher degree of sickness. The analysis is based on logistic regression, were the bankrupt event is explained by accounting and market based variables. In accordance with literature, the liquidity and profitability ratios turned out to be the most important variable in forecasting default followed by

the company size and its activity. Melody Y.King et al in their study at temped to provide an imperially support rational for classifying the firms into two groups, those declaring bankruptcy within two years and those remaining solvent. The apparent rational for engaging in reverse splits differs between two groups that is weak firms attempting to increase their stock price while solid firms seeking to reposition their stocks in the market.

Altman (1968) collected data from 33 failed firms and 33 matching firms, during the period 1946-1965, to find discriminating variables for bankruptcy prediction. In his seminal paper, Altman evaluated 22 potentially significant variables of the 66 firms by using multiple discriminant analysis to build the discriminant function with five variables. The discriminant function is as follows:

$$Z = 0.012\,X_1 + 0.014\,X_2 + 0.033\,X_3 + 0.006\,X_4 + 0.999\,X_5,$$

, where $X_1 \equiv$ working capital/total assets, $X_2 \equiv$ retained earnings/total assets, $X_3 \equiv$ EBIT/total assets, $X_4 \equiv$ market value of equity/book value of total debt, and $X_5 \equiv$ sales/total assets.

Many of the research works have been conducted, over the period to evaluate the financial position of the company with the help of the various ratios or by applying the Multiple Discriminate Analysis to predict the corporate failure. (Gupta, 1999) Attempted a refinement of Beaver‟s method with objective of predicting the business failure.

1. **Md. Nazrul Islam and Shamem Ara Mili (2012)** conducted a research on "Financial Diagnosis of Selected Listed Pharmaceutical Companies in Bangladesh" published in European Journal of Business and Management Vol 4, No.4, 2012. In spite of satisfactory level of bankruptcy of the industry as found by The Z-Score Model, it was observed from the study that the liquidity, profitability and solvency position of most ition are unsound financial management, inadequate working capital, slow conversion of receivables and inventory into cash, lower position of sales, higher amount of debt, no professional distribution house, restrictions on patent right, fixed mark-up system, contrary policy of the government, vulnerability of environmental risk and increased cost of production.

2. A study on business performance with the combination of Z-score and FOAGRNN hybrid model. African Journal of Business Management Vol.6 (26), pp. 7788-7798, 4 July, 2012

   Springate, Gordon L.V., (1978) the detection of business performance is to find out the soundness of business performance of an enterprise before the enterprise runs into any crisis or goes bankrupt in order to guard against any disaster before it happens. In this paper, the financial statements and various financial ratios of TSEC/GTSM are calculated. They analyzed that the possible reasons for a company to be rated as failure may be excess debt and excess working capital, that may weaken the financial health of that particular Company.
3. **Majumder and Rahman (2011)** used financial ratios and Prof. Altman's MDA Model (The Z-Score Model) for financial analysis of selected pharmaceutical companies in Bangladesh. They observed from the study that the profitability, liquidity and solvency position of the selected pharmaceuticals are not in sound position and it was also observed that most of the selected pharmaceuticals have a lower level position of bankruptcy.

4. Financial Health of Hdfc: A Case Study, Dr.D.Maheswara Reddy; Mr K. V. N. Prasad, Volume 1, Issue 3 (December, 2011). Lehman brothers and Merry lynch (US) had exposed and experienced the bankruptcy. One of the reasons for bankruptcy is accumulating NPAs. The main theme of this paper is to check whether HDFC BANK(one of the best private bans) is performing well year after year or lagging behind in terms overall performance. The performance can be evaluated and judged by way of analyzing the financial statements of Bank. Despite various ratios deployed in the determination of financial performance of the companies, no single ratio will help the management in assessing the same. Hence, the model has been deployed, which popularly has known as Z score model, to assess the financial health of the sample bank.

5. (**DR. V. K. SHOBHANA**, **DR. N. DEEPA)** Financial distresses are a tight cash situation in which a business cannot pay the owed amounts on the due date. When a firm is under financial distress, the situation sharply reduces its market value and larger customers may cancel their orders. A firm in financial distress may face bankruptcy or liquidation leading to delay in meeting its liabilities. Altman's Z-score model has been employed in this paper to predict the risk of financial distress of the

Bombay Dyeing and Manufacturing Company Limited, from the year **2002-2011**. The results indicated that the liquidity, working capital turnover efficiency and solvency position of the company has not been satisfactory. The Z-score analysis revealed that the company is suffering from financial distress and there are indications of turnaround activities undertaken by the company to improve the performance. VOLUME NO. 3 (2012), ISSUE NO. 1 (JANUARY).

6. Predicting Corporate Default – An Assessment of the Z-score Model on the U.S. Market 2007-2010 (Johansson & Jonna Kumbaro). The testing of the Z-score model has been an interesting and challenging experience where the outcome has shown dissimilar results. However, since there is no default prediction model showing 100%, a 85% accuracy for the Z-score and a 75% accuracy for the Z''-score in identifying bankrupt firms is good news. Furthermore, when applying the optimal cut off value suggested by Altman (1968) more than 40 years ago and getting an accuracy of 80% and 75% for one and two reporting periods prior to bankruptcy indicates that a financial ratio model still has a fairly reliable ability to predict default even though it is not as accurate as in the initial sample. It is an affirmation that business logics to some extent still apply irrespectively of changes in the economic environment and the corporate world.

7. **Campbell et al. (2008)** propose a reduced form econometric model\using both accounting and market data to predict corporate bankruptcies and failures. They argue that their model is more accurate than other alternatives. They also show that the most powerful distance to default measure introduced by Bharath and Shumway (2008) does not add any value to their model in failure risk assessment.

8. **(Hillier, Grinblatt & Titman, 2008)**. Positive Net Present Value Investments: An investor may be able to identify a good investment opportunity by analyzing the net present value of the investment. Projects that are predicted to create value are those whose present value exceed their costs and therefore indicate that future cash flows can be produced more cheaply internally than by investing in financial assets. These are called positive net present value investments and indicate that an arbitrage profit associated with the investment project can be made. The project evaluation will result in one of

two alternatives. If the net present value is negative the project will be rejected and if the net present value is positive it will be accepted.

9. (Nikolaos Gerantonis, Konstantinos Vergos, Apostolos G. Christopoulos) Research Journal of International Studies - Issue 12. This paper analyses whether Altman Z-score models, can predict correctly company failures. The empirical analysis examines all listed in the Athens Exchange companies, during the period 2002-2008 and discontinuations of operation for these companies during the same period. It is investigated whether Z-score models can predict bankruptcies for a period up to three years earlier. Our study shows that Altman model performs well in predicting failures. This is in line with other findings. The empirical results are interesting since they can be used by company management for financing decisions, by regulatory authorities and by portfolio managers in stock selection.

10. **M.Khannadhasan (2007)** ascertained the financial health of Wendt India Ltd Company by using 'Z' score model. He concluded that company's overall financial health was good. V.Dheenadhyalan (2008) adopted Z score to predict the corporate failure of steel authority of Indian Limted. The Z score of the SAIL showed a rising trend throughout the study period and it was concluded that the financial health of the SAIL was good. Dr.K Venkat Janardhan Rao and M.Durga Prasad (2009)15 examined the financial performance of Eicher Motors Ltd is better than M M. According to K.R.Sharma16, different models like R.A.Yadav and S.S.Srivastava model, Prof,C.D.Bhattacharya model and Prof..K.B.Mehta's model have been used to measure financial health. The present study is based on Prof.K.B Mehta's model because the model considers Indian conditions.

11. (**Pereiro, 2006)** This study utilizes the Z'-score multi-discriminant financial analysis model which provides the framework for gauging the financial structure of the firms. This is in addition to the use of the ANOVA and correlation tests to support the evidences from the Z-score model. Although these traditional techniques or models do not provide much guidance on how they should be applied to emerging market, the models have already been empirically tested in emerging markets and used with good results.

12. **(Vilton, 2005)** Used Z model to measure the financial distress of IDBI and concluded that IDBI is likely to become insolvent in the years to come. From the above reviews, the researcher identified the research gap which could be dealt in this study. International Journal of Business and Management Tomorrow Vol. 2 No. 5

13. **. Krishna Chaitanya (2005)** find the financial health of IDBI with the help of Altman's Z score and concluded that IDBI is not in the health zone. Through the calculation of Z Score V.Dheenadhyalan (2008) predicted the corporate future of steel authority of India Limited and concluded that the financial health of SAIL is goomnd as the score is in raising trend.

14. **Ben Mc Clure (2004**) his paper describes in detail the studies carried out by Altman to predict business bankruptcy. Altman made regular changes to achieve the perfect equation which could predict bankruptcy. The following research paper summarizes the research of Altman that have being made to develop the Altman Z score model. It can be safely said that Altman's Z score Model can be applied to modern economy to predict distress and bankruptcy one, two & three years in advance. ASIAN JOURNAL OF MANAGEMENT RESEARCH 212 Volume 3 Issue 1, 2012

15. **Johah Aiyabei (2002)** applied Z score model examine the financial performance of small business firms based in Kenya and discussed the theoretical aspect of a financially distressed firm based on a cyclical concept.

16. **Mansur A. Mulla (2002)** conducted a study to evaluate financial health of textile mills by using Z score model. Selvam,M . And others (2004) made a study to predict the financial health and viability of India cements Ltd. They concluded that the cement company under the study was just on the range of financial collapse. Further, they write that financial health of cement companies has been subject to empirical investigation. Krishna Chaitanya (2005) measured the financial distress of IDBI with the help of Altman's Z score model and predicted that IDBI is not in the health zone and is likely to be

insolvent in the near future. Mansur.A Mulla,in his paper Use of Z score analysis for Evaluation of financial health of Textile Mills- Jan-March(2002),",Vol.XIX, No.4, pp37-41.

17. **Collins, R.A., & Green, R.D. (1982)**. Statistical methods for bankruptcy prediction. Journal OF Economics and business, pp 349-354, Volume 34 Issue 1, 2011. Application of Z score analysis in evaluating the financial health of pharmaceutical companies. The absolute figures in the financial statements are not serving this purpose. Despite, the ratio analysis considered as a powerful tool for analysis, but combining different ratios into single measure of the probability of sickness will be more powerful than a single ratio. In research paper of an attempt is made to predict the financial health of two selected sample pharmacy companies (Aurobindo Datong Bio-Pharmacy Ltd and RANBAXY Laboratories Ltd) for five years 2005-06 to 2009-10 using modified Altman's model. The research findings of the study are that the overall financial health of both (Aurobindo Pharmacy Ltd and Ranbaxy Laboratories Ltd) companies was good.

18. William H. Beaver (1967) selected five ratios out of thirty financial ratios to study the financial health of 79 successful units and 79 unsuccessful units. The ratios were expected; failed firms had more debt and lower return on assets. They had less cash but more receivables as well as low current ratios. They also had fewer inventories. It was observed that cash flow to total debt had maximum prediction power among different ratios in the study.

Research methodology

Problem statement of the study

Analysis on Financial Health of Cement Industry by using Altman's z score model.

The efficiency of the business is measured by the amount of profit generated during the particular financial year. The profit of a business may be measured by the studying the profitability of investment in it. Hence, an attempt has been made to study the profitability of cement companies in India. Corporate liability is a vital factor in business. If sufficient liability is not maintained, the enterprise is technically involved and at least faces the financial embarrassment of renegotiating its obligations to creditors. The present study also aims to analyze the liquidity position of the selected cement companies.

Need of the study

All above reviews show the significance of measurement of financial distress. The present study made an attempt to measure the financial distress along with liquidity, solvency and leverage position of selected cement manufacturing units of India. Cement is one of the core industries which plays a vital role in the growth and expansion of a nation. Its contribution is more in country's economic growth and GDP. So the present study is concentrated on financial health of selected cement manufacturing units in India.

Objective of the study

The study attempts to assess the financial Health of the sample companies in terms of retained earnings to total assets position, networking capital position, and Equity-debt position, Return on total assets position, and Net sales turnover position of sample companies.

To analyze the financial performance through liquidity, working capital, investment efficiency and solvency ratios and to measure the financial distress of the select cement manufacturing units with Altman's Z-Score model.

Sources of the Data

"A Study on Financial Health of Cement Industry in India: a 'Z' Score Approach" has made by using data from financial statements of top five cement companies .The period of the study has not yet been decided and the data has been collected from internet through various web sites and the annual reports of the respective companies. Different ratios are calculated, the simple statistical techniques such as mean and standard deviation test are also applied to analyze the consistency, stability and overall trends in the different ratio used in Altman's 'z' score approach.

Research Design

A research project conducted scientifically has a specific framework of research from the problems identification to the presentation of the research report. This framework of conduction research is known as research design.

Research designs can be grouped into three categories- exploratory research, descriptive research and casual research

We have used descriptive research design in this research work because the variable is well known and well define and existing theory of analysis of financial statement for module liquidity and Activity is going to be checked. Also well aware about the problem and subject of the research and also we know the various techniques of solving particular problem.

Types of research **:** Analytical Research & Descriptive research

Method of data collection **:** Secondary Method

Source of data collection **:** Annual report of 5 cement industries

Research data **:** 5 years (March 2008 to March 2012) annual

Data Collection: The annual reports of the company have been collected from the official website of the respected company and another various related websites.

Research Tools:

In this project different type of charts/tables and Ratios are used as the analytical tool. Charts are visually tempting and make stable for users to see.

Scope of the study:

This analysis will be applied to the cement industry as a whole. Basically quantitative data are collected of five years from 2004-2005 to 2008-2009 to do the research work of five companies namely: Gujarat Ambuja Cement Ltd, Grasim Industries, India Cement Ltd, UltraTech Cement Ltd, and ACC Cement Ltd.

Techniques Used For the Analysis

For the purpose of analysis, we have used Altman's Z-score (Revised-1983 for private manufacturing unit) to predict, analyze and compare the financial health of the companies. The specific variable used is explained in Table-A and the interpretation of Z-score value is presented in Table B. and to study the financial health of the five different cement companies, different ratios are calculated, the simple statically techniques such as mean and standard deviation were also applied to analyze the consistency, stability and overall trends in the different ratios used in Altman's Z-score approach.

In 1983, Altman developed a revised Z-score model for privately held firms. "Credit analysis, private placement dealers, accounting auditors, and firms themselves are concerned that the original model is only applicable to publicly traded entities (since X4requires stock2 price data)" (Altman, 1993, p.202). The revised Z-scores substitute the book value of equity for the market value in X4. The new Z-score model ratios are listed below:

TABLE-A

Financial Ratio	**Co-efficient of the ratio**
Networking capital / total assets (X1)	0.717
Retained earnings / total assets (X2)	0.847
EBIT / total assets (X3)	3.107
Net Worth (capital funds) / total liabilities (X4)	0.420
Net sales / total assets (X5)	0.998

$Z' = 0.717\ \mathbf{x_1} + 0.847\ \mathbf{x_2} + 3.107\ \mathbf{x_3} + 0.420\ \mathbf{x_4} + 0.998\ \mathbf{x_5}$

X1 indicate the liquid assets in relation to the size of the company.

X2 indicates profitability in relation to the size of the company

X3 indicates the operating efficiency apart from tax and leveraging factors

X4 indicates the long term solvency of the company

X5 indicates the sales generating capacity of the company

TABLE-B

Score	Interpretation
Bellow 1.23	Indicates bad financial performance leads to Bankruptcy
1.23≤ **z** ≤2.90	Indicates the poor financial performance (Grey Area)
Above 2.90	Indicates Good Financial Performance

Altman's new sample produces similar results as the original Z-score model, indicating 90.9% accuracy in bankruptcy forecasting at least one year prior to actual failure. Firms with scores over 2.90 have a 97% chance of continuing operations with financial health (Altman, 1983).

1.NET WORKING CAPITAL RATIO

Net Working Capital/Total Assets

The working capital ratio is the same as the current ratio. It is the relative proportion of an entity's current assets to its current liabilities, and is intended to show the ability of an entity to pay for its current liabilities with its current assets. A working capital ratio of less than 1.0 is a strong indicator that there will be liquidity problems, while a ratio in the vicinity of 2.0 is considered to represent good short-term liquidity.

TABLE 1 (x1)

Year	Ambuja Cement	Birla Cement	India Cement	UltraTech Cement	ACC Cement
2007-08	-0.02	-0.14	-0.09	-0.18	-0.04
2008-09	-0.09	-0.15	-0.11	-0.15	-0.08
2009-10	-0.09	-0.08	-70.08	-0.14	-0.10

2010-11	-0.12	-0.08	-0.08	-0.14	-0.11
2011-12	0.15	-0.06	-0.16	-0.16	-0.000

The Net 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. Liquidity and size characteristics are explicitly considered. Ordinarily, a firm experiencing consistent operating losses will have shrinking current assets in relation to total assets.

The table 1 shows the data of Net working capital of selected cement companies. It shows that there is a negative working capital ratio in all the companies in all year except the year 2011-12 of Ambuja cement it indicate that the liquidity position of that particular year is too good compare to everyone. The negative ratio shows that the firms are not able to meet there liquidity needs. While those Net working capital are less negative, sustained the greater ability to meet their current obligations.

2. RETAINED EARNINGS TO TOTAL ASSETS RATIO

Retained earnings to total assets (X2)

TABLE 2 (x2)

Year	**Ambuja Cement**	**Birla Cement**	**India Cement**	**UltraTech Cement**	**ACC Cement**
2007-08	0.18	0.003	0.11	**0.21**	0.16
2008-09	0.13	0.022	0.07	**0.16**	0.19
2009-10	0.12	0.031	0.05	**0.16**	0.10
2010-11	0.09	0.036	0.00	**0.08**	0.11
2011-12	0.08	0.089	0.04	**0.13**	0.07

The higher your retained earnings to assets ratio the less reliant your company is on other common types of debt and equity financing. Retained earnings are 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 much debt. The retained earnings to total assets ratio of the sample companies is depicted in the TABLE-2. As observed from the table, all the companies taken as a sample sustained good retained earnings to total assets ratio from 2007-2008 to 2011-12 where UltraTech cement sustained highest retained earnings to total assets ratio. .

3.EBIT to Total Assets Ratio

EBIT/TOTAL Assets (X3)

This ratio reveals how much revenue your small business produces for every Rupee invested in assets. In general, a higher ratio suggests greater efficiency than a lower one. A ratio of a company's net sales to total assets. It is a measure of how efficiently management is using the assets at its disposal to promote sales. A high ratio indicates that the company is using its assets efficiently to increase sales, while a low ratio indicates the opposite. It is also known as total asset turnover.

TABLE 3 (x3)

Year	Ambuja Cement	Birla cement	India Cement	UltraTech Cement	ACC Cement
2007-08	0.33	**0.46**	0.19	0.36	0.32
2008-09	0.27	**0.30**	0.14	0.26	0.36
2009-10	0.23	**0.32**	0.11	0.28	0.20
2010-11	0.22	**0.16**	0.04	0.14	0.20
2011-12	0.22	**0.13**	0.11	0.21	0.21

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. Furthermore, insolvency in a bankrupt sense occurs when the total liabilities exceed a fair valuation of the firm's assets with value determined by the power of the assets

The return on total assets of the sample companies is depicted in the **table 3**.Among all the sample companies; **Birla** sustained the highest return on total assets ratio, and India Cement sustained the lowest return on total asset ratio.

4. MARKET VALUE OF EQUITY TO TOTAL LIABILITIES

Net Worth (capital funds) / total liabilities (X4)

Earnings before interest and tax (EBIT) to total assets ratio indicates a proportion between the measure that shows company's profitability and company's assets. In short, it represents general profitability of the company's assets. The ratio is considered an indicator of how effectively a company is using its assets to generate earnings before contractual obligations must be paid.

TABLE 4 (x4)

Year	Ambuja Cement	Birla cement	India Cement	UltraTech Cement	ACC Cement
2007-08	**0.95**	0.82	0.65	0.61	0.91
2008-09	**0.98**	0.85	0.65	0.63	0.91
2009-10	**0.99**	0.73	0.66	0.74	0.93
2010-11	**0.99**	0.69	0.62	0.72	0.93
2011-12	**1.00**	0.67	0.64	0.77	0.99

Equity is measured by the combined market value of all shares of stock, preferred and Common, while liabilities include both current and long term. 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

The market value of equity to total assets ratio of the sample companies is depicted in the **Table 4**. Among all the companies, **Ambuja cement** sustained the highest equity debt ratio for a period from 2007-08 to 2011-12. On an average basis and India Cement sustained Lower ratio.

5 .NET SALES TO TOTAL ASSETS

Net sales / total assets (X5)

TABLE 5 (x5)

Year	Ambuja Cement	Birla cement	India Cement	UltraTech Cement	ACC Cement
2007-08	1.04	1.40	0.59	1.24	1.34
2008-09	1.07	1.19	0.60	1.11	1.22
2009-10	1.00	0.89	0.59	1.13	1.09
2010-11	1.04	0.71	0.52	0.89	1.21
2011-12	1.10	0.68	0.66	1.10	1.52

The capital-turnover ratio is a standard financial ratio illustrating the sales generating ability of the firm's assets. It is one measure of management's capacity in dealing with competitive conditions. This final ratio is quite important because it is the least significant ratio on an individual basis.

The total assets turnover ratio of the sample companies is depicted in the above table. Among all the companies, ACC cement sustained the highest equity debt ratio for a period from 2005-06 to 2009-10. On an average basis, ACC cement registered highest market value of equity to total assets ratio of 150.64% followed by India cement 94.03%, Ambuja cement 79.64%, Grasim 35.07%, UltraTech 23.74%.

Z- SCORE VALUES OF SAMPLE COMPANIES

TABLE 6

Average of all the variables

Variable	Ambuja cement	Birla Cement	India Cement	Ultratech Cement	Acc Cement
x1	-0.04	-0.10	-0.10	-0.15	-0.07
x2	0.12	0.03	0.05	0.15	0.12
x3	0.25	0.27	0.11	0.25	0.25
x4	0.98	0.75	0.64	0.69	0.93
x5	1.05	0.97	0.59	1.09	1.27

TABLE-B

Score	Interpretation
Bellow <1.23	Indicates bad financial performance leads to Bankruptcy
1.23≤ **z** ≤2.90	Indicates the poor financial performance (Grey Area)
Above 2.90	Indicates Good Financial Performance

Z score of Ambuja Cement

$Z' = 0.717\ \mathbf{x_1} + 0.847\ \mathbf{x_2} + 3.107\ \mathbf{x_3} + 0.420\ \mathbf{x_4} + 0.998\ \mathbf{x_5}$

=0.717(-0.04) + 0.847(0.12) + 3.107(0.25) +0.420(0.98) +0.998(1.05)

= 2.30

The Z score of Ambuja cement is 2.30 which come under second category that is less than2.90 which indicates poor financial performance (Grey Area).

Z score of Birla **Cement**

$Z' = 0.717\ \mathbf{x_1} + 0.847\ \mathbf{x_2} + 3.107\ \mathbf{x_3} + 0.420\ \mathbf{x_4} + 0.998\ \mathbf{x_5}$

=0.717(-0.10) +0.847(0.036) +3.107(0.27) +0.420(0.75) +0.998(0.97)

= 2.19

The Z score of Birla cement is 2.19 which come under second category that is less than2.90 which indicates poor financial performance (Grey Area).

Z score of India Cement

$Z' = 0.717\ \mathbf{x_1} + 0.847\ \mathbf{x_2} + 3.107\ \mathbf{x_3} + 0.420\ \mathbf{x_4} + 0.998\ \mathbf{x_5}$

= **0.717**(-0.1) + 0.847(0.05) + 3.107(0.11) + 0.420(0.64) + 0.998(0.59)

= 1.17

The Z score of India cement is 1.17 which comes under First category that is less than 1.23 which indicates bad financial performance leads to Bankruptcy

Z score of Ultratech **Cement**

$Z' = 0.717\ \mathbf{x_1} + 0.847\ \mathbf{x_2} + 3.107\ \mathbf{x_3} + 0.420\ \mathbf{x_4} + 0.998\ \mathbf{x_5}$

= 0.717(-0.15) + 0.847(0.15) + 3.107(0.25) + 0.420(0.69) + 0.998(1.09)

= 2.11

The Z score of UltraTech cement is 2.11 which come under second category that is less than2.90 which indicates poor financial performance (Grey Area).

Z score of ACC Cement

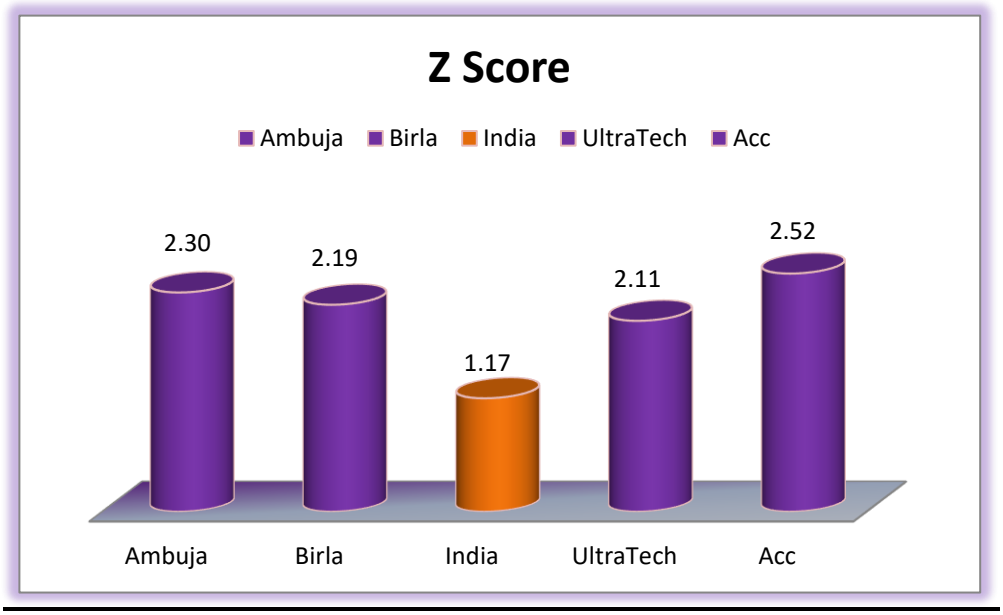
$Z' = 0.717\ x_1 + 0.847\ x_2 + 3.107\ x_3 + 0.420\ x_4 + 0.998\ x_5$

$=0.717(0.07) + 0.847(0.126) + 3.107(0.258) + 0.420(0.934) + 0.998(1.276)$

$= 2.52$

The Z score of Ambuja cement is 2.52 which come under second category that is less than2.90 which indicates poor financial performance (Grey Area).

Z- SCORE ANALYSIS



The Z score value of Ambuja Cement is less than ACC Cement and good than the Birla, Indian and Ultratech but they are still in the grey zone. So, among all selected Cement Industry Ambuja Cement is safe than other three Cement Company only ACC Cement is higher than the Ambuja Cement on financial figure.

The position of the ACC cement and Ambuja cement is between 2 and 2.99 which show that the Company is on alert to exercise the caution. Also the score of the India Cement is less than 1.23 which shows that there are chances that the company could go bankrupt in next 2 years.

The position of Ambuja ,Birla, ACC, UltraTech is more than 2 which shows the company is on alert to exercise the caution, while the position of India Cement is below 2 which shows the company's financial position is embarrassing.

Limitations of the Study

The main problem with this formulation of solvency risk is that the formula is not suited for many industries. We found that Altman Z-Score was not industry specific enough to our liking. For instance, low or negative working capital doesn't score well on Altman Z but some industries can operate with zero or negative working capital. For example, a restaurant gets paid in cash, but their suppliers will generally give them net 30 days on their payables and the inventory (food) turns over very quickly.

Three major drawbacks are:

- The past performance involved in a firm's accounting statements may not be informative in predicting the future.
- Accounting fraud.
- The present study is completely relied on secondary source of data only.
- The study is confined to last 5 years only.

Findings

- On an aggregate basis it is clear from the Z- score table- A, from last five years ACC, Ambuja, Birla and UltraTech Company's financial health is sound. While India Cement is below 1.23, so there are chances that the companies could go bankrupt in next 2 years.

- Because of less Net working capital possessed by companies, so in future companies might not meet their current liabilities. So there is higher probability that the companies could go for liquidation. From the analyses we find that only Ambuja Cement has positive net working capital in the year 2012.
- The RE ratio of sample companies was very satisfactory especially UltraTech, ACC and Ambuja cement. While the retained earnings ratio of Birla and India cement is not satisfactory, so it is suggested that India and Birla Cement should improve its retained earnings to sustain in the competitive environment.
- The result of the sales volume clearly showed that the sample companies did not succeed in achieving the standard ratio through sales. Because the standard asset turnover ratio of cement industry is 1.5 and only ACC Cement is achieving this level. Companies must have to utilize their asset properly.
- EBIT to total assets ratio is a measure of the true productivity of the firm's assets, independent of any tax or leverage factors. The analysis indicates that Birla cement recorded the highest operating efficiency compared to other companies.
- Equity is measured by the combined market value of all shares of stock, preferred and common, while liabilities include both current and long term. Ambuja Cement and ACC cement registered highest market value of equity to total assets ratio followed by Birla cement, UltraTech cement and India cement

Conclusion

Financial health of a company is a matter of concern for every stakeholder of the business. It is, infect, the financial position of the company that drive the decision making process of any stakeholder. In this context, Altman Z-score plays an important role in judging the financial soundness of the company. The present study was conducted to study, analyze and compare the financial conditions of the sample companies. The study, on an overall basis, revealed that among all the sample companies ACC cement, Ambuja cement, Birla cement and UltraTech cement were financially sound during the study period barring India cement which has slightly lowered Z-score on the basis of average scores during the study period.

The Z-Score formula for predicting bankruptcy of Edward Altman is a multivariate formula for a measurement of the financial health of a company and a powerful tool to diagnose the probability that a

company will go bankrupt within a 2 year period. Studies measuring the effectiveness of the Z-Score have shown the model is often accurate in predicting bankruptcy (72%-80% reliability).

In this comprehensive project report we have concluded that out of five cement companies Ambuja cement, Birla Cement, UltraTech Cement and ACC Cement have good position than India Cement. So, India cement has suffered more problems in its coming future because it has lower Z score value.

From this research, conclusions can be drawn that out of six selected bank four bank that is HDFC,ICICI,AXIS and KOTAK MAHINDRA BANK have good position than other two bank and rest two that is DCB and YES are low z-score. So they have to face more problem in future than the other four banks as they both are near to the distress zone.

Suggestions

All Cement company can improve their financial performance or z-score by maintaining and increasing Working Capital, Retained Earnings, and EBIT.

- The other way to improve the z-score is that they have to reduce their total debt.
- For maintaining the liquidity all companies must have to increase the level of current asset.
- The working capital management of the company indicates a little laxity of the management. If things allowed remain so, the company may not meet its short term obligations and it is a dangerous signal. Hence the company requires adopting a proper technique for the management of its working capital.
- The company requires improvement of its operational efficiency keeping in view its long term perspective.