

Analysis of Financial Progress of Cement Industry in Pakistan Using Altman's Z-score

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Abstract

Cement is vital component in construction activities. Cement industry plays vital role in the country's infrastructure development, Pakistan cement industry is existed before split of sub-continent, in 1972, Pakistan cement industry was nationalized. The secondary data was collected and used the financial statements from 2010 to 2015 provided by the state bank of Pakistan, Altman's z-score modeling was contemplated as one of the best model for forecasting corporate financial health of the cement business. In this research findings demonstrate one angle clear and loud that inventory, debtors and creditors management policy of industry play substantial part in profitability. With the passage of time and arrival of china Pakistan economic corridor (CPEC) this sector is now flourishing, from the year 2014 to 2015, 48% cement companies lies in safe zone, 28% in grey zone and also 25% in distress zone. Investment in this sector may provide high return for the investors.

Keywords: Cement manufacturer, Financial performance, Ratios, Z-Score

1 Introduction

The China Pakistan Economic Corridor (CPEC) announcement, a project of 46 billion dollars, that will include infrastructure development projects all over Pakistan, according to (Shah, 2016) now 3.00 million tons of cement demand created through China Pakistan economic corridor (CPEC).

Cement is essential component in construction activities. Cement industry plays vital role in the country's infrastructure development, due to enormous geographical acreage and substantial community of country, assorted activities concerning construction managed by local government, eminent personalities and by other entities.

A study by (Arshad, et al. 2013) Pakistan cement industry is existed before split of sub-continent, the first cement plant was established in 1921 at WAH and at the time of division of sub-continent in 1947 Pakistan was awarded by four cement factories with potential of 470,000 tons per annum and were situated at WAH, Karachi, Dandot and Rohri. Afterward more cement plants were installed in the government and private sector.

In 1972, Pakistan cement industry was nationalized and following the economic reform order The State Cement Corporation Of Pakistan (SCCP) was established, as a consequences 10 units of cement were delegated to SCCP with installed potential of 2.8 million tons per annum.

Accessible raw material is the vital cause of existence of Pakistan cement industry, measureless retain of clay and limestone sustain the Pakistan cement industry for more 50-60 years. At the time of separation of sub-continent cement production was only 470,000 tons per annum, in 1954 production increased to 660,000 tons per year in opposition to demand of 1,000,000 tons per year. Pakistan industrial development corporation (PIDC) established two cement plants, first one is Zeal pak with capacity of 240,000 tons per annum and second is Mapel Leaf with capacity of 100,000 tons per annum, PIDC increases the production of cement 340,000 tons per annum, and meet the demand of 1000,000 tons per annum (Haq et, al. 2011).

In 1992 the Government privatized 8 cement plants, because of privatization of cement industry SCCP can not keep its control over prices and as a consequence under private sector new plants were established. 28 cement plants were working (4 plants working under Government and 24 under private sector) in Pakistan with potential of 19.5 million tons per annum against demand of 9.5 million per annum and now exporting to other countries including (Iraq, Sri Lanka, Russia, United Arab Emirates and also to African countries (Arshad, et al. 2013).

From year 2013-2017 The average production of cement in Pakistan is 22.23 million of tons per annum and In November of 2016 it reaches high of 34.69 million of tons and reached lofty capacity of consumption is 98.61%. Pakistan cement industry produces 5 types of cements. 1_Ordinary Portland cement (OPC), 2_Slag cement, 3_Sulphate resistant cement (SRC), 4_SuperSulphate resistant cement (SSRC) and 5_white cement.

As the demand of cement increases in Pakistan, Four cement factories publishes their aim to increase the capacity of production to meet the demand arise, For computing the financial progress of business entity a lot of

techniques are available but Altman Z-score is considered as more reliable tool .

Altman's work have proved that there is a very positive degree of reliability of forecasting financial distress in the united states and in emerging markets, This model forecast probability of bankruptcy of manufacturing concerns and give almost 77% reliability in forecasting the financial health of the business.

The Pakistan cement industry is a remarkable one because of producing excessive quantities of cement than the regional requirement, there is prevailing vigorous competition in the Pakistan cement industry, the cement industries existing in Pakistan producing almost the same quality cement, The vigorous competition between cement industries in Pakistan make the cement companies unguarded in term of financial sustainability. So, it is circumstance of substantial concern to forecast the financial distress of the industry and also to forecast possibility of bankruptcy.

In this circumstance, the study is substantially one to give accurate statistics about financial distress of cement industries of Pakistan.

2 Literature Review

There are many researchers that have studied on analysis of the credit strength of cement industry, some of the following are beneficial and useful for our research.

The study when being held in Bangladesh by (Goel, 1978) during the study portion he found that growth rate of capital was severely low and the profitability was switching to the declining trend , throughout the study period external source of finance conduct remarkable supremacy in minimizing the internal sources. It was experienced in study period that financial strength or health was deteriorated in term of ratios measured by profitability, liquidity and financial structure.

Financial analysis may be defined as the process of identification of financial strength and weakness of the company by establishing the relationship between different components of position statement and performance statement (Pandey, 1979).

(Pandey, 1979) explain that the financial scrutiny may be interpret as the procedure of recognition of financial health of organization (strength and weakness of company) by establishing the connection between elements of performance statement and the position statement.

(prasanna, 1995) The analysis of financial statement is very important to managers, lenders, security analysts and others. Financial statements analysis is very much essential to lenders, security analysts, managers and others .

(canagavally,2000) has calculated the performance as relationship of profitability, growth, size and risk of companies after rand before consolidation, the study has scrutinize the influence of merger on market price of selected companies .

(muslumov, 2005) has outlook an association with declining value added and the privatization and cement industry's profitability in turkey. A decline in return on asset (ROA) has an influence on decreasing the profitability of stockholder and value as well of the company. Thus decreasing return on asset has direct and negative effect on productivity of asset. However, result of this study is unpredictable with literary cross-sectional studies done in different countries concerning privatization.

(shah, 2006) illustrate foot boosting the increasing consumption of cement , advance technology was being adopt by Indian cement and the efficient use of manpower leads to maximum utilization of their capacity. Moreover, seven to eight percent growth rate in figure is anticipated to be prevailing in the upcoming years. However, the foreign cement companies including Pakistan pay a head to satisfy growing demand of cement.

In this research findings demonstrate one angle clear and loud that inventory, debtors and creditors management policy of industry play substantial part in profitability, performance, the managers involved should give due concentration for policy systematize in this concern as well as appliance of such working capital policies (vishani& shah, 2007)

(kolansizoglu, 2007) has examined that in the recent year cement industries are being more competitive as the time parameter point out negative result in the supply equation and though there is very diminutive perfect value, the outcome is statistically substantial.

(samluther, 2007) has stated that risk management is substantial part of all types of business concern, the study examined the way of accomplishing minimizing of risk, liquidity adequacy and maximizing the profit.

(portela, 2007) the study has found three point of view of scrutinizing the performance ; increasing the profit, getting the efficiency boost of sale customers and the most favorable use of variant negotiation channels, in order to achieving these effectiveness the researcher has recognized an association between profit and operational efficiencies as well as operational and transactional efficiencies , therefore, the comparability make it to help to recognize the weaker or stronger branch of concern. The researcher has also examine the positive relation between profit and operational efficiency and also between operational and transactional efficiency, the quality of service also impact on profit and operational efficiency.

The study examine influencing factor of firm profitability by mean of variables concerned with working

capital management practices using a specimen of Turkish manufacturing firm for the 1998-2007, the study show that leverage, account receivable period and inventory period substantively and absolute, the study also scrutinize that size of organization and the cash conversion cycle not have substantial effect on profitability of firm but only thing effecting the firm profitability negatively is leverage (Samiloglu&Demrtgunes, 2008).

(Mathuva, 2009) has demonstrate the effect of working capital management for calculating profitability based on trial of 30 firms listed in Nairobi stock exchange (NSE) between 1993-2008 , in study data are analyzed based on spearman and Pearson's correlation , the pooled ordinary least square (OLS) and the fixed effect regression model.

(Gaganis, 2009) has identified and analyzed the total factory productivity and risk factor is generally liable for profit efficiency .in the study it is also analyzed the impact on efficiency of various factors e.g. income per capita, loan to deposit ratio and return on assets.

(Mazhar, 2010) the study has examine that capital structure decision of various firms listed in stock exchange , therefore, the research expose that the rate of growth, tangibility , provision for tax, tangibility and profitability has substantial impact on leverage.

3 Methodology

In this study Altman's model has been taken to predict the financial soundness and health of the cement industry. The secondary data was collected and used the financial statements from 2010 to 2015 provided by the state bank of Pakistan, This study examine the x1, x2, x3, x4 and x5 of altman's z-score where ,

$$\text{EQUATION: } Z = 1.2x_1 + 1.4x_2 + 3.3x_3 + 0.6x_4 + 1.0x_5$$

X1= Working Capital/Total Assets

X2=Retained Earning /Total Assets

X3=Operating Income/Total Assets

X4=Market Value of Equity/Book Value of Debt

X5=Sale/Total Assets

Financial analysis using Altman's model

sector name	years	X1	X2	X3	X4	X5	Z	ZONE
Gharibwal Cement Ltd.	2010	-0.37	0	0	2.41	0.16	2.20	Grey
Gharibwal Cement Ltd.	2011	-0.41	0	0	2.20	0.27	2.06	Grey
Gharibwal Cement Ltd.	2012	-0.28	0	0	2.12	0.40	2.24	Grey
Gharibwal Cement Ltd.	2013	-0.17	0	0	2.38	0.48	2.70	Grey
Gharibwal Cement Ltd.	2014	-0.16	-0.16	0.44	2.85	0.56	3.54	Safe
Gharibwal Cement Ltd.	2015	-0.17	0.004	0.54	3.15	0.60	4.13	Safe
Dadabhoy Cement Industries Ltd.	2010	-0.09	0.00	0.00	1.16	0.00	1.07	Distress
Dadabhoy Cement Industries Ltd.	2011	-0.13	0.00	0.00	1.16	0.00	1.03	Distress
Dadabhoy Cement Industries Ltd.	2012	-0.13	0.00	0.00	1.15	0.00	1.02	Distress
Dadabhoy Cement Industries Ltd.	2013	-0.16	0.00	0.00	1.12	0.00	0.95	Distress
Dadabhoy Cement Industries Ltd.	2014	-0.18	-0.25	-0.06	1.10	0.00	0.60	Distress
Dadabhoy Cement Industries Ltd.	2015	-0.19	-0.26	-0.02	1.09	0.00	0.62	Distress
Dandot Cement Co. Ltd.	2010	-0.55	0.00	0.00	1.46	0.08	0.99	Distress
Dandot Cement Co. Ltd.	2011	-0.64	0.00	0.00	1.32	0.27	0.95	Distress
Dandot Cement Co. Ltd.	2012	-0.88	0.00	0.00	1.15	0.40	0.66	Distress
Dandot Cement Co. Ltd.	2013	-1.19	0.00	0.00	1.02	0.05	-0.12	Distress
Dandot Cement Co. Ltd.	2014	-1.21	-1.84	-0.48	1.04	0.37	-2.12	Grey
Dandot Cement Co. Ltd.	2015	-1.42	-2.15	-0.40	0.92	0.78	-2.28	Grey
Dewan Cement Ltd.	2010	-0.26	0.00	0.00	0.95	0.17	0.85	Distress
Dewan Cement Ltd.	2011	-0.30	0.00	0.00	0.95	0.25	0.90	Distress
Dewan Cement Ltd.	2012	-0.28	0.00	0.00	0.96	0.33	1.01	Distress
Dewan Cement Ltd.	2013	-0.19	0.00	0.00	0.97	0.40	1.18	Distress
Dewan Cement Ltd.	2014	-0.16	0.00	0.07	1.03	0.43	1.37	Distress
Dewan Cement Ltd.	2015	-0.10	0.00	0.10	1.14	0.46	1.60	Distress
Fauji Cement Co. Ltd.	2010	-0.09	0.00	0.00	0.94	0.14	0.99	Distress
Fauji Cement Co. Ltd.	2011	-0.02	0.00	0.00	0.91	0.15	1.04	Distress
Fauji Cement Co. Ltd.	2012	-0.05	0.00	0.00	1.10	0.38	1.42	Distress
Fauji Cement Co. Ltd.	2013	0.02	0.00	0.00	1.27	0.53	1.82	Distress
Fauji Cement Co. Ltd.	2014	0.03	0.17	0.62	1.30	0.60	2.71	Grey
Fauji Cement Co. Ltd.	2015	0.07	0.23	0.69	1.40	0.61	3.00	Safe

Fecto Cement Ltd.	2010	-0.15	0.00	0.00	0.87	0.93	1.65	Distress
Fecto Cement Ltd.	2011	-0.23	0.00	0.00	0.90	1.06	1.73	Distress
Fecto Cement Ltd.	2012	-0.18	0.00	0.00	1.03	1.31	2.16	Grey
Fecto Cement Ltd.	2013	0.03	0.00	0.00	1.39	1.37	2.78	Grey
Fecto Cement Ltd.	2014	0.28	0.48	0.75	1.57	1.22	4.30	Safe
Fecto Cement Ltd.	2015	0.41	0.62	0.76	1.92	1.12	4.83	Safe
Flying Cement Co. Ltd.	2010	-0.01	0.00	0.00	1.49	0.01	1.50	Distress
Flying Cement Co. Ltd.	2011	-0.06	0.00	0.00	1.43	0.13	1.51	Distress
Flying Cement Co. Ltd.	2012	-0.10	0.00	0.00	1.40	0.23	1.53	Distress
Flying Cement Co. Ltd.	2013	-0.13	0.00	0.00	1.33	0.14	1.35	Distress
Flying Cement Co. Ltd.	2014	-0.15	-0.04	0.10	1.34	0.34	1.58	Distress
Flying Cement Co. Ltd.	2015	-0.18	0.00	0.10	1.37	0.36	1.65	Distress
Kohat Cement Co. Ltd.	2010	-0.25	0.00	0.00	0.78	0.43	0.95	Distress
Kohat Cement Co. Ltd.	2011	-0.11	0.00	0.00	0.78	0.67	1.33	Distress
Kohat Cement Co. Ltd.	2012	-0.08	0.00	0.00	1.01	1.01	1.95	Grey
Kohat Cement Co. Ltd.	2013	0.20	0.00	0.00	1.36	1.05	2.61	Grey
Kohat Cement Co. Ltd.	2014	0.28	0.68	1.06	1.53	0.90	4.44	Safe
Kohat Cement Co. Ltd.	2015	0.30	0.75	0.92	1.63	0.73	4.33	Safe
Lafarge Pak. Cement Ltd.	2010	-0.40	0.00	0.00	1.09	0.35	1.04	Distress
Lafarge Pak. Cement Ltd.	2011	-0.06	0.00	0.00	1.10	0.41	1.44	Distress
Lafarge Pak. Cement Ltd.	2012	-0.09	0.00	0.00	1.25	0.49	1.66	Distress
Lafarge Pak. Cement Ltd.	2013	0.00	0.00	0.00	1.69	0.51	2.20	Grey
Lafarge Pak. Cement Ltd.	2014	-0.07	-0.12	0.30	1.89	0.54	2.53	Grey
Lafarge Pak. Cement Ltd.	2015	-0.07	-0.12	0.30	1.89	0.54	2.53	Grey
Lucky Cement Ltd.	2010	-0.09	0.00	0.00	1.74	0.64	2.29	Grey
Lucky Cement Ltd.	2011	-0.04	0.00	0.00	1.84	0.63	2.44	Grey
Lucky Cement Ltd.	2012	0.18	0.00	0.00	3.31	0.82	4.30	Safe
Lucky Cement Ltd.	2013	0.19	0.00	0.00	1.61	0.76	2.56	Grey
Lucky Cement Ltd.	2014	0.27	0.19	0.63	1.68	0.92	3.70	Safe
Lucky Cement Ltd.	2015	0.22	0.19	0.60	1.68	0.77	3.46	Safe
Maple Leaf Cement Factory Ltd.	2010	-0.20	0.00	0.00	0.75	0.52	1.07	Distress
Maple Leaf Cement Factory Ltd.	2011	-0.18	0.00	0.00	0.81	0.39	1.02	Distress
Maple Leaf Cement Factory Ltd.	2012	-0.17	0.00	0.00	0.83	0.47	1.13	Distress
Maple Leaf Cement Factory Ltd.	2013	-0.07	0.00	0.00	0.95	0.54	1.41	Distress
Maple Leaf Cement Factory Ltd.	2014	0.00	0.11	0.52	1.11	0.59	2.33	Grey
Maple Leaf Cement Factory Ltd.	2015	-0.03	0.25	0.59	1.38	0.66	2.86	Grey
Pioneer Cement Ltd.	2010	-0.42	0.00	0.00	1.03	0.38	0.99	Distress
Pioneer Cement Ltd.	2011	-0.39	0.00	0.00	1.11	0.54	1.25	Distress
Pioneer Cement Ltd.	2012	-0.30	0.00	0.00	1.17	0.64	1.51	Distress
Pioneer Cement Ltd.	2013	0.03	0.00	0.00	1.28	0.65	1.96	Grey
Pioneer Cement Ltd.	2014	0.13	0.00	0.72	1.40	0.68	2.93	Grey
Pioneer Cement Ltd.	2015	0.30	0.00	0.97	1.92	0.70	3.88	Safe
Thatta Cement Ltd.	2010	0.01	0.00	0.00	1.30	1.07	2.39	Grey
Thatta Cement Ltd.	2011	0.11	0.00	0.00	1.18	0.93	2.22	Grey
Thatta Cement Ltd.	2012	-0.11	0.00	0.00	1.12	1.07	2.07	Grey
Thatta Cement Ltd.	2013	0.07	0.00	0.00	0.97	0.73	1.77	Distress
Thatta Cement Ltd.	2014	0.11	0.16	0.65	1.04	0.65	2.60	Grey
Thatta Cement Ltd.	2015	0.16	0.24	0.54	1.18	0.61	2.74	Grey
Power Cement	2010	-0.25	0.00	0.00	0.74	0.42	0.92	Distress
Power Cement	2011	-0.19	0.00	0.00	0.74	0.44	1.00	Distress
Power Cement	2012	-0.31	0.00	0.00	0.77	0.57	1.02	Distress
Power Cement	2013	-0.18	0.00	0.00	0.83	0.62	1.28	Distress
Power Cement	2014	-0.17	-0.34	0.14	0.84	0.60	1.07	Distress
Power Cement	2015	-0.05	-0.22	0.54	0.82	0.64	1.73	Distress
Zeal Pak Cement Factory Ltd.	2010	-0.57	0.00	0.00	0.69	0.09	0.21	Distress
Zeal Pak Cement Factory Ltd.	2011	-0.83	0.00	0.00	0.57	0.06	-0.21	Distress
Zeal Pak Cement Factory Ltd.	2012	-0.97	0.00	0.00	0.50	0.04	-0.43	Distress
Zeal Pak Cement Factory Ltd.	2013	-0.91	0.00	0.00	0.46	0.02	-0.43	Distress
Zeal Pak Cement Factory Ltd.	2014	-0.91	0.00	-0.43	0.46	0.02	-0.86	Distress

Zeal Pak Cement Factory Ltd.	2015	-0.91	0.00	-0.43	0.46	0.02	-0.86	Distress
Attock Cement Pakistan Ltd.	2010	0.29	0.00	0.00	1.95	1.09	3.33	Safe
Attock Cement Pakistan Ltd.	2011	0.15	0.00	0.00	1.79	1.10	3.04	Safe
Attock Cement Pakistan Ltd.	2012	0.27	0.00	0.00	1.74	1.18	3.19	Safe
Attock Cement Pakistan Ltd.	2013	0.33	0.00	0.00	1.65	1.08	3.06	Safe
Attock Cement Pakistan Ltd.	2014	0.35	0.86	0.74	1.46	1.05	4.45	Safe
Attock Cement Pakistan Ltd.	2015	0.38	0.89	0.88	1.62	1.07	4.84	Safe
Bestway Cement Ltd.	2010	-0.18	0.00	0.00	0.81	0.39	1.02	Distress
Bestway Cement Ltd.	2011	-0.16	0.00	0.00	1.07	0.51	1.42	Distress
Bestway Cement Ltd.	2012	-0.10	0.00	0.00	1.33	0.53	1.75	Distress
Bestway Cement Ltd.	2013	0.04	0.00	0.00	1.50	0.60	2.14	Grey
Bestway Cement Ltd.	2014	0.02	0.62	0.92	1.94	0.70	4.20	Safe
Bestway Cement Ltd.	2015	-0.01	0.40	0.56	1.12	0.42	2.49	Grey
Cherat Cement Co. Ltd.	2010	-0.09	0.00	0.00	1.12	0.71	1.74	Distress
Cherat Cement Co. Ltd.	2011	-0.02	0.00	0.00	1.06	0.79	1.83	Distress
Cherat Cement Co. Ltd.	2012	0.05	0.00	0.00	1.40	1.16	2.60	Grey
Cherat Cement Co. Ltd.	2013	0.18	0.00	0.00	2.24	1.26	3.68	Safe
Cherat Cement Co. Ltd.	2014	0.18	0.64	0.60	3.95	0.69	6.06	Safe
Cherat Cement Co. Ltd.	2015	0.18	0.64	0.60	3.95	0.69	6.06	Safe
D.G. Cement Co. LTD	2010	0.06	0.00	0.00	1.35	0.35	1.75	Distress
D.G. Cement Co. LTD	2011	0.12	0.00	0.00	1.49	0.38	2.00	Grey
D.G. Cement Co. LTD	2012	0.16	0.00	0.00	1.66	0.46	2.28	Grey
D.G. Cement Co. LTD	2013	0.30	0.00	0.00	2.31	0.40	3.00	Safe
D.G. Cement Co. LTD	2014	0.42	0.27	0.38	3.47	0.37	4.91	Safe
D.G. Cement Co. LTD	2015	0.39	0.37	0.42	3.46	0.36	5.00	Safe
Cement - Overall 2010	2010	-0.15	0.00	0.00	1.02	0.37	1.24	Distress
Cement - Overall 2011	2011	-0.10	0.00	0.00	1.08	0.43	1.41	Distress
Cement - Overall 2012	2012	-0.05	0.00	0.00	1.22	0.55	1.72	Distress
Cement - Overall 2013	2013	0.07	0.00	0.00	1.35	0.58	2.01	Grey
Cement - Overall 2014	2014	0.13	0.21	0.53	1.55	0.64	3.06	Safe
Cement - Overall 2015	2015	0.12	0.25	0.53	1.52	0.58	3.01	Safe

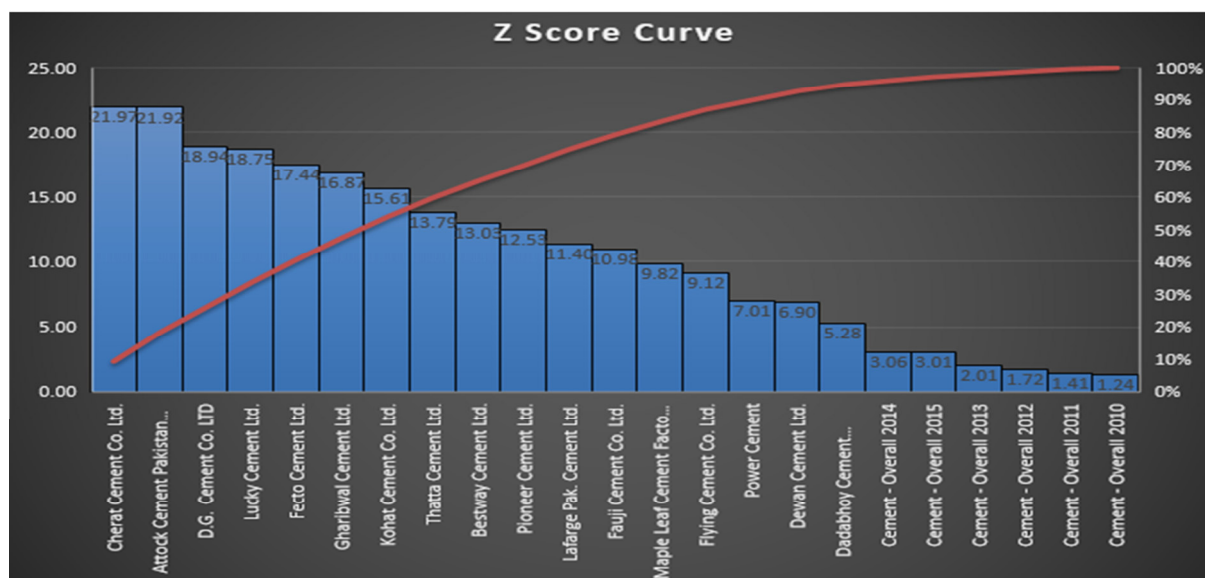


Fig: 1 Z score Curve

Table: 1 Altman's Model

Altman's model		
Distress	Grey	Safe
<1.89	1.89-2.99	>2.99

In the study, the financial health of cement industry can be calculated by Altman's z-score model, the companies standing below 1.89 or standing in distress zone are considered as fail, the companies standing between 1.89 to 2.99 or lies in grey zone these firms considered in critical situation while the company standing

above 2.99 considered in safe zone.

4 Conclusion and Recommendations

Table:2 zone table

Year	Distress	GREY	SAFE	TOTAL
2010	16	3	1	20
2011	15	4	1	20
2012	12	6	2	20
2013	9	8	3	20
2014	5	6	9	20
2015	5	5	10	20

The study predicts that from 2010 to 2012, approximately 71% cement companies lies in distress zone, 21 % cement companies are in grey zone and 7% are in safe zone, with the passage of time and arrival of china Pakistan economic corridor (CPEC) this sector is now flourishing, from the year 2014 to 2015, approximately 48% cement companies lies in safe zone, 28% in grey zone and also 25% in distress zone. For investors this sector provides the best opportunity for making investment decisions. Investment in this sector may provide high return for the investors and ultimately economic growth of Pakistan. Altman's z-score model helps in predicting financial health and bankruptcy before occurrence of such events, the early detection results in a better and a sound business decision, a sound business decision is the crucial part for the success and survival of business.

Excellent performance of this sector depend upon rules and regulation of regulatory authority, the regulatory body must come up with more strict and prudent rule and regulation so that further improvement in this sector can take place.

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