

Predicting Bankruptcy: Case of Cement Industry in Pakistan



BY

MASOOD IQBAL

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Name	Registration number
MASOOD IQBAL	05/ MBA(1.5)/PIDE/2013

Supervisor:

Muhammad Ali Kemal

Research Economist

PIDE Islamabad

Final approval

This Thesis Title

Predicting Bankruptcy: Case of Cement Industry in Pakistan

By

MASOOD IQBAL

Has been approved

For the Pakistan Institute of Development Economics, Islamabad

External examiner: _____

Mr. Tahir Masood

Supervisors: _____

Muhammad Ali Kemal

Research Economist

PIDE Islamabad

Head of department: _____

Dr. Usman Mustafa

Head, Department of Business Studies

PIDE, Islamabad

Certificate

It is certify that Mr. Masoodiqbal has carried out all the work related to this thesis under my supervision at the department of management sciences,

Pakistan Institute of Development Economics Islamabad

Supervisor:

Sir Muhammad Ali Kemal

Department of Economics & Finance

PIDE Islamabad

Submitted through:

Dr. Usman Mustafa

Head, Department of Business Studies

PIDE, Islamabad

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I would like to dedicate my thesis to my Parents because their prayers and encouragement let me to complete my research work on time.

DECLARATION

I declare that this research work is my own effort, the material is properly identified and source of information is reliable, referenced completely and it is acknowledged according to the guideline which is provided to do this research work.

Table of Content

Predicting Bankruptcy: Case of Cement Industry in Pakistan	1
Predicting Bankruptcy: Case of Cement Industry in Pakistan	2
Predicting Bankruptcy: Case of Cement Industry in Pakistan	3
A Post Graduate Thesis submitted to the Department of Business Studies as fulfillment of the requirement for the award of Degree of Master in Business Administration.....	3
Final approval	4
This Thesis Title	4
Predicting Bankruptcy: Case of Cement Industry in Pakistan	4
DECLARATION	7
List of tables.....	9
Abstract.....	10
Chapter1: Introduction.....	11
Objective of the study:	15
Chapter 2: Literature Review	15
Data:.....	22
Chapter3: Methodology	23
Altman Z-Score.....	27
Estimation of the formula	27
Z-Score Ingredients.....	29
Zones of Discrimination	30
Accuracy of Altman’s Z-Score	30
Bankruptcy Prediction through Altman Z-Score	31
Chapter4: RESULTS AND DISCUSSION	42
Conclusion:	46
RECOMMENDATIONS	47
Reference	49

List of tables

Table 1: DG khan Cement	31
Table 2: Thatta Cement.....	32
Table 3: Attock cement.....	32
Table 4: Maple leaf cement.....	33
Table 5: Facto cement.....	34
Table 6: Kohat cement.....	34
Table 7: Power (Al-Abbas) cement	35
Table 8: Gharibwal cement.....	35
Table 9:Fauji cement.....	36
Table 10:Dandot cement	37
Table 11: Lafarage Cement.....	37
Table 12: Pioneer cement.....	38
Table 13:Flying cement	39
Table 14: Cherat cement	39
Table 15: Lucky Cement.....	40
Table 16: Dewan Cement.....	40
Table 17: Bestway Cement	41

Abstract

Bankruptcy prediction is one of the challenging tasks for every type of organization in different industries of the world. Asian countries like Sri Lanka, India, China and Pakistan used this model many times. Pakistan Cement industry takes large part in the economic development of the economy of Pakistan. Pakistan Cement industry facing many problems like electricity and gas shortage, financial constraints etc. In my thesis I predict bankruptcy in the cement industry of Pakistan and found that there are bankrupt companies in the cement industry of Pakistan. For measuring the financial health of a business firm there are lots of methodologies available. But the Altman's Z-Score has been proven to be a reliable instrument across contexts. There is evidence that Altman Z-Score model has 76.9% accuracy in bankruptcy prediction of the underlying Business. In my study I examine 18 Cement companies listed in (KSE) Karachi Stock Exchange during the period 2010 to 2014. In this study I used Altman Z-Score model for bankruptcy prediction for five years prior to bankruptcy. Altman Z-Score is the most efficient model used for bankruptcy prediction of the companies. Cement companies financial statements and business recorder is used to collect the data for the year 2010 to 2014. In my study I found that there is 30% companies of the companies is in distress zone, 17 % in gray zone and 53 % is in safe zone. The results of my study can be used by the management of the companies for financing decisions by portfolio managers and regulatory authorities for investment. The findings of my study can be useful for stockholders to choose investment options, managers to take

financial decision and others to look after their interest in the concern cement manufacturers of the country.

Chapter1: Introduction

Bankruptcy prediction is a challenging task for every type of organizations in different industries of the world. Banks credit rating agencies auditor's underwriters and regulators analyze the financial position for their own interest. For analyzing the financial position of the organization different approaches can be used. At the time of monetary and economic crisis model selection for predicting bankruptcy is very important. Edward Altman developed a model in 1968 for bankruptcy prediction called Altman Z-score model. This model is also known (MDA) multiple discriminate analysis model. Edward study of bankruptcy prediction presented that mostly bankruptcy reasons is poor management, severe competition, not due to economic recession. Edward Altman use 66 firms in his study, on that half are bankrupt and half non bankrupt. Altman compare bankrupt and non bankrupt organizations in his study. Altman selected five ratios from large number of ratios for bankruptcy prediction. The Edward Altman study result shows 95% accuracy one year prior of bankruptcy and 72% two year before to failure.

Bankruptcy is a legal state of a corporation or individual that is become insolvent or in other words not capable to repay their outstanding debts. The bankruptcy process start with a formally request by the debtor or behalf of creditor. The debtors all assets are calculated and estimated, the assets are used to pay back the part of the outstanding debt. On the successful achievement of the bankruptcy procedures, the debtor is reassured if the debt obligation incurred earlier to filing for bankruptcy.

Bankruptcy offers an individual and corporation a chance to reset by forgiving debts and also provide by offering creditor a chance to get some measure of refund based on what assets are available.

There are two main ways to file bankruptcy under U.S code:

Chapter 7 Bankruptcy, Chapter 13 Bankruptcy,

Chapter 7 bankruptcy comes under liquidation category of U.S code. It is also called straight bankruptcy or liquidation. It is called liquidation because liquidation trustee may take and put up for sale some of the assets to repay some of the debts.

There are a number of types of Reorganization bankruptcies but most commonly used bankruptcy of chapter 13. In chapter 13 we keep all of our property, and make monthly payments over 3 to 5 years to repay the outstanding debt.

Bankruptcy Prediction is the skill of predicting bankruptcy and dissimilar measures of monetary distress of public companies. Financial distress states where a firm cannot meet or has trouble repay its monetary obligations to their creditors. Bankruptcy prediction is a massive area of finance and accounting research. This area is important because it is related to investors and creditors to know about the firm financial condition. There are many reasons of business to become bankrupt. The most important reasons of bankruptcy are given below.

The primary reason of bankruptcy is the profitability of the business, many underlying factors reduce a company ability to make profit and lead to bankrupt. Market condition is another important reason of bankruptcy. Some time economy is in boom condition and some time is a bust cycle. During bust period consumer confidence and spending tends to decline that lead low revenue. Competition is another market factor that decreases the revenue and lead to bankrupt. Internal business condition can also cause bankruptcy. For example weak management, improper location of the corporation, customer loss due to deficiency in the products etc. Financing is one of the important reasons of bankruptcy. Many businesses take loans to finance their operations. If the business struggle, his lender may refuse to grant additional loan which could lead to bankrupt. Poor decision making is another important cause of bankruptcy.

Due to lack of planning of management in decision making can cause bankruptcy. Accidents are also one of the biggest causes of business bankruptcy.

There are some negative effect of Chapter 7 bankruptcy and Chapter 13 bankruptcy. When we decide to file under Chapter 7 or Chapter 13 of the U.S Bankruptcy Code, we will expectedly receive most important monetary relief in some form through a refund plan in Chapter 13 or through a full release of some amount outstanding in Chapter 7. Bankruptcies have also some side effects that are given below:

Temporarily weakened credit has negative effect bankruptcy of chapter 13 and chapter 7. Bankruptcy filing is seen as a negative action on our credit report and bankruptcy filing itself will appear on our credit report for seven to 10 years. So this is a negative impact of bankruptcy on our credit dimensions.

Difficulties getting loans is another side effect of chapter 13 and chapter 7. Because of the effect a bankruptcy filing has on a person's credit, qualifying for a loan make difficult for business to get loan.

A difficulty in getting work is another side effect of bankruptcy prediction chapter 7 and chapter 13. The employs chick credit and criminal background. So filing bankruptcy cause serious problem in hiring the best employs for getting and completing work.

Chapter 7 and chapter 17 bankruptcy have also **positive effects**. Everything related to bankruptcy is not negative. Bankruptcy prediction is designed to release the tension of debt for all those who are affected. Some of the positive effects of filing bankruptcy is given below:

Filing Bankruptcy gives a fresh financial start chance for the business. Cessation of creditor contact is another important positive effect of chapter 7 and chapter 13 bankruptcies. When we file bankruptcy formally request in a court, then the lawful protection called the automatic stay takes as a result. This lawful protection from all types of contacts of debtors and creditors that now we will be not dealing with the threats of recovery, garnishment or foreclosure on phone or by electronic mail during our case.

We can **avoid Bankruptcy** by adopting the following techniques.

We can avoid bankruptcy by selling anything that we have extra and repay the outstanding debts. Take some step without waiting when you see that you can't pay the debts anymore. If you wait pending becoming behind on payments, it may be very late.

We can also avoid bankruptcy by asking Creditors to help us in avoiding Bankruptcy. By asking and talking with our creditor can decrease the amount of installment or no money on due date. Inform your creditors that you have financial difficulty and desire to keep away from bankruptcy. State your keenness to pay the liability and ask if they can help ease the load by decreasing your monthly payment or lowering your interest rate or both.

We can also get help from family and friends to avoid bankruptcy. Add how much money you need to keep away from bankruptcy. Cautiously think how much you have the capacity to supply, and then take from friends and family to fulfill the need to repay your debt. When you take money from them then make a plan that how you will be repaying to your family and friends when you become stable financially. Total all your debts. When we know the true picture of our debts we can precede the next step to avoid bankruptcy. To know our financial position we have to gather every statement, bill and each document that have effect on our monetary situation. To know about our financial situation we had total up all of our debts and assets. Distribute debts in good and bad categories. Good debts come under home loans and bad debts are credit card debts, personal loans, medical bills and expensive car.

We can also avoid bankruptcy by reducing expenses. To reduce expenses add up all the expenses. Divide expenses into necessities and non-necessities. Add up the monthly cost for the necessities. And only spend on necessities to avoid bankruptcy.

We can also avoid bankruptcy by Debt Settlement. If debt very high from our income then we need to think about debt settlement. A credit counselor can make useable to talk with our creditors to reduce the balance owed. In a situation to going bankrupt it better option to consider a credit counselor.

In this study the companies has been selected from the cement sector listed in Karachi Stock exchange.

In this study I used secondary data that had collected from different sources. The financial data is taken from Karachi stock exchange (KSE) , companies websites, business recorder etc. I had used the financial data annually that cover the period of 2010 to 2014. I had analyzed the data quantitatively and used Microsoft excels as a tool for analysis.

Objective of the study:

The objective of my study is to predict bankruptcy in Cement industry of Pakistan by using EdwardAltma Z-Score model.

Chapter 2: Literature Review

This is section reviews the past studies done on the bankruptcy. In this section result of past studies as well as their applied methodology is discussed.

Mizan and Hossain (2014) investigated and assessed the financial health and soundness of the companies in the cement industry in Bangladesh by using Altman Z-score model. For this purpose all the listed cement companies were selected, and the relevant data was collected on those respective companies from different sources. The companies listed were five in numbers. After analyzing the data of those companies by Altman z-scoring model, it was found that two of the companies have sound financial stability and the other three were financially in a weak position. The study helped out the managers and the potential investors to design their relevant investing and asset management strategies. (Mizan & Hossain, 2014)

Abbas and Rashid (2011), conducted a study in order to identify that the role of financial ratios I significant in determining the bankruptcy of the companies of the non financial sector of the Pakistan. Data collected was analyzed through multivariate discriminate analysis (MDA). Twenty four financial ratios were calculated for the sample for a period of 5 years. The study provide evidence that the firms which has a z-value below zero or a negative value were considered bankrupt, whereas the firm with anon zero z-value fall into the non bankrupt zone. It was also noted that the model applied achieved about 76.9% results, when checked for accuracy.(Abbas & Rashid, 2011)

Muhammad Shahzad Ijaz, Ahmed Imran Hunjra, Zahid Hameed, Adnan Maqbool and Rauf-i-Azam (2013), Investigate the financial status of sugar sector companies listed in Karachi Stock Exchange by using Altman Z-Score and current ratio. In this study they used the total population sampling methodology was used and all thirty five sugar sector listed companies is included in this study to get the deep information of this issue. Data were collected from state bank balancesheet and company financial report for the period 2009 and 2010. The finding of this study shows that Altman Z-score and current ratio is perfect technique of assessing the financial position of the sugar sector listed companies of Karachi stock exchange. This study shows that there are financially distress companies in sugar sector of Pakistan. This study provides evidence for the acceptability of these models for the bankruptcy prediction. The results of this study are equal to Jones and Scott. This study can also extend in other sector like textile sector that is the biggest sector of the Karachi stock Exchange listed companies with the highest accuracy. (Shahzad Ijaz, Imran Hunjra, Hameed, Maqbool, & Azam, 2013)

Nimalathasan Balasundaram (2009), Investigated that the financial condition of the stock exchange listed companies is the problem for every stock holder that is worried. Company's management tries to improve the financial position of the companies. The investors also give attention to the company's financial position for their investment decisions. The reason of this study is to explore the financial reliability of all listed manufacturing business in stock exchange for the period of five years that is from 2003-7. The study objectives are to analyze the monetary soundness of listed companies by applying Altman Z Score model. The second purpose of this study is to distinguish the monetary soundness companies in Sri Lanka. The last objective of this study is to suggest a solution for the problems. This study shows that the selected companies were not financially sound during the analysis period. The test of soundness shows that Z-score that the companies under analysis be on the edge of breakdown. To keep the selected listed FIRMS from liquidation the monetary position of the chosen listed businesses is better by management, by realistic measures, by participative management, by motivation personals etc to ensure in the model selected listed corporations. (Balasundaram, 2009)

Hussain et al (2014), conducted a study to investigate the ability of Altman Z-scoring model that whether it measure the bankruptcy risk or in the other words the failure of concerned companies in Pakistan. For this purpose a sample of 21 companies was selected from the textile sector

which includes 12 stable companies and 9 bankrupted companies, listed in the Karachi stock exchange. Data on these companies was taken from the KSE website, SECP and the Official websites of those companies. The period of the study was from 2000 to 2010. The prediction of Altman Z- scoring model were quiet accurate and representing the reality. This provided a clear evidence that Altman Z-scoring model can give good prediction about the bankruptcy risk of the textiles sector of Pakistan. (Hussain, Ali, Ullah, & Ali, 2014)

Anjum (2012), analyzed the bankruptcy or financial efficiency of business enterprises through using Altman Z-scoring model. The paper sum up the examine work of Dr. Altman that had made and developed the specified model. It can be said with a sound surety that Altman Z-scoring model is a good tool to describe the Financial efficiency or soundness of any given business entity. (anjum, 2012)

Warren Miller and Morningstar (2009), Investigated the performance of two normally applied bankruptcy prediction models that is the Altman Z-Score model that is accounting ratio based for bankruptcy prediction and structure distance to default model. For the purpose to find the best and accurate model for measuring bankruptcy prediction we can use these models. For comparing these models the authors include manufacturing companies. They found that Distance to default model is more accurate and superior ordinal and cardinal bankruptcy prediction in this word. They also found that Disance to default is more superior bankruptcy prediction power in this world. Distance to default model is most durable bankruptcy prediction but the problem of this model is that that it has less stable than Z-Score. (Miller & Morningstar, 2009)

Robert A. Collins (1980) Investigated that Atman Z-Score, Meyer and Pifer methods of bankruptcy prediction provides accurate and best results of bankruptcy prediction. When these methods are used for predicting bankruptcy on the similar data set then the Altman Z-Score method for bankruptcy prediction perform and gives the better results compare to theoretically appealing Meyer and Pifer method. So Altman Z-Score model is more superior compare to Meyer and Pifer model. (Collins R. A., 1980)

Md. Kamal Hossain, SyedMoudud-Ul-Huq investigated to find out the credit strength and monetary performance of cement industries in Bangladesh through investigating the financial report for the period from 2007 to 2011. Financial ratios are employed to measure the

Liquidity (Working capital/Total Assets), Profitability (Retained Earnings/Total Assets), Efficiency (EBIT/Total Assets), Volatility (MVE/BVL) and Total Asset Turnover analysis (Sales to Total Assets). For analyzing, the credit strength of the cement industry in Bangladesh, a renowned model of predicting credit strength named (Hossain & Huq, 2014) Altman Z Score Model has been used. The collected data are also analyzed by using statistical tool. The study find that the cement companies in Bangladesh are mostly on financial Distress Position because the sample industry held about 48% over the last 5 years where about 32% of the companies are in the Grey Zone and only 20% of the companies are in Safe Position. So the credit strength of cement industry in Bangladesh is far behind of its landmark.

Edward Altman investigated the distinguish ratio model confirmed to be really correct in bankruptcy predicting properly in 94 % of the first sample with 95 % of the all companies in the non bankrupt and bankrupt groups allocate, to their real group classification. Also, the differentiate function was exact in frequent subordinate, samples presented, to test the credibility, of the model. Examination of the single, ratio actions previous to insolvency confirmed the model outcome that bankruptcy can be exactly forecast up to two year's previous to real disappointment, with the correctness lessening, speedily subsequently the second year. A constraint of the study is that the corporations observed, were all openly held industrial companies, for which comprehensive financial data will be available, as well as market price, references. Azone for upcoming study therefore would be to enlarge the examination to relatively minor asset sized Corporations and combination of business bodies where the occurrence of business failure is enhanced than with big organizations. A number of applied and imaginary determinations of the model were recommended. The historical take in commercial credit estimate interior control measures and speculation strategies. Intrinsic in these applications is the hypothesis that signs of worsening noticed by a relationship key can be witnessed evidently. A possible hypothetical part of prominence lies in the conceptualization of disciplined portfolio collection. One of the present borders in this zone is in a genuine plan of those securities and the categories of investment strategies which are essential to equilibrium the portfolio and dodge problematic hazard. The faultless method is to comprise those securities having undesirable co-variance with other stocks in the portfolio. However these stocks are not probable to be calm to discover if at all. The difficulty becomes somewhat more answerable if a technique is brought in which throw-outs stocks with great problem risk or comprises them in a

short selling situation. The differentiate ratio model seems to have the much capacity to comfort this problem. Further study however is necessary on this topic. (Altman, 1968)

Sanobar Anjum examined that the Industries are entities which make products or deliver amenities for revenue purpose. To be capable to forecast the economic safety of a commercial entity has led to many research studies. Financial ratios are them portent instrument of financial trustworthiness of a corporation. Financial ratios are the means to resolve the operational and financial competence of corporate entities. There exist a large sum of ratios advocate by several writers. Altman established a z-score model by using ratios as its basis. With the assistance of the Z-Score model Altman could forecast financial proficiency /Insolvency up to 2 to 3 years in advance. The subsequent research work demonstrates in detail the readings carried out by Altman to forecast business insolvency. Altman made ordinary variations to attain the faultless equation which could forecast insolvency. The subsequent research paper recapitulates the research of Altman that have being completed to advance the Altman Z-score model. It can be definitely said that Altman's Z-score Model can be applied to current economy to forecast distress and insolvency one two and three years in advance. (anjum S. , 2012)

Usama Saleem Malik Muhammad Aftab and Dr. Umara Noreen checked the relation between financial pain and market presentation of firm in the arrangement of share performance by consuming Z Score bankruptcy forecasting model as the substitution of distress danger and the following understood stock returns of the distress noted corporations as a substitution of systematic risk. The sample is taken from Karachi Stock Exchange listed corporations. We found that distress risk is not substantial sufficient to clarify the projected stock returns in the instance of the Pakistani distress listed companies. Edward Altman's (1968) measure of distress is functioning zed to test the financial fitness of companies. The consequences show that distressed firms outstrip as balance to healthy companies. This study supposed that distress risk is a systematic risk in relation to the Pakistani stock market to some degree. (Malik, Aftab, & Noreen, 2013)

Aurelija Mažintienė¹, Daiva Burkšaitienė explored the strong signs establish up in a corporation's financial statements about a year or two before the business goes toward insolvency. The determination of the general is to describe the knowledge of insolvency and to give the key

structures of insolvency forecast. The precise financial disappointment forecasting can offer time for commercial directors to take actions and save the corporations from fiscal liquidation. This article comments that managers have a ordinary tendency to underestimate risks and misjudge their aptitude to save insolvent or near insolvent corporations. Therefore the precise forecast of insolvency has been an vital and approximately deliberate theme in the secretarial and finance arena for a long time. In relations of the prosperous acknowledgement of the association inside records of corporation and businesses healthier commercial modeling and speculation choices can be establish and applied. (Mažintienė & Burkšaitienė, 2012)

Data:

In this study we had selected cement sector companies listed in KSE and we used secondary data that had collected from different sources. The financial data is taken from Karachi stock exchange (KSE) , companies websites, business recorder and from financial statements of the companies.

I had used the financial data annually that cover the period of 2010 to 2014.

Chapter3: Methodology

Bankruptcy prediction has different methodologies. We can predict bankruptcy of the firm by any one of the following three categories:

The analytical model basically relies on reasons of failure. It is derived from the accounts of the company. There may be single or multiple characters of it differentiated with the univariate or multivariate model. The focus of it is basic process of modeling which is used for other companies as well. The statistic models are of different types, having varying characters mentioned below.

The first model that has one variable is usually dependent on the financial ratios and their analysis. These ratios and financial standards show the financial performance of firms either they are bankrupt or financially stable or to make the difference between them these ratios are used as predictive variable (Altman, 1993, Marris, 198)

An analysis used for the comparison of some variables having discrimination with regards to other variables is called as Multivariate discriminate analysis (MDA). It tells that whether the particular firm is bankrupt or financially stable. The standards are made according to classification of bankrupt and non bankrupt groups scores to find out the level of bankruptcy (Klecka,1981; Altman, 1993; MMorris,1998)

There is another model given to find out the chances of success and failure of a particular firm which act as dependent variable on the functioning of explaining variable is known as Linear probability model (LPM). It acts as a line between to find out the exact ratio of difference between failing and progressed firms (maddala, 1983, Theodossiou, 1991, Gujarati, 1998. Morris, 1998)

Another model known as logit model, functions as a representation to find out the reasons behind failure and success of a firm. In this model of Logit the odd variables are used that shows the probability of occurring of an event. This is linear probability of model which alters this chances or linear probability with that of other distribution functions. If we have a situation in which probability of .5 is given than it clearly shows that we have both option either the .5 chances of bankruptcy and equal chances of non bankruptcy. An estimate is given that indicate

that if the value of estimation is closer to 1 than the chances of bankruptcy are less (Maddala, 1983, Theodossiou, 1991, Gujarati, 1998, Morris, 1998).

Another model named as Probit model which usually alter the normally distributed function and the interpretation and explanation of model remain same as for Logit model (Maddala, 1983; Theodossiou, 1991, Gujarati, 1998, Morris, 1998).

The process of distributing the variable functioning from one state to another is done by a tool known as Cumulative sums (CUSUM). To find out the bankruptcy behavior of firms or the reason behind their failure or non failure, the finite order variable model is used. Thus the methodology used, help out to find the demanded changes and the solution to the exact problems as early as it can be. The firm's performance is judged by the score obtained in time series performance evaluation method. If the scores are in negative, it shows that firm's financial condition is not good (Page, 1954, Healy, 1987, Kahya and Theodossiou, 1999)

To find the distributed lag model, the partial adjustment process is used as a theoretical model. The findings of this model states that review of bankruptcy is explained better with the methods of managing cash by the firms. For example the behavior of firm to pay back the loaned amount shows its performance and management level. The cash balance shows inelastic behavior by the failing company as compared to other companies which shows healthy behavior in cash balance (Laitinen, 1998, Gujarati, 1998)

Artificially intelligent expert system model (AIES) act as another focused model which emphasize the failure symptoms. It is the second important type of model. AIES focus on symptoms of failure. AIES had drawn mainly from companies accounts. Artificially intelligent expert system model (AIES) usually multivariate in nature. Artificially intelligent expert system model (AIES) has results of technological advancement and informational development. Artificially intelligent expert system model (AIES) heavily depend on computer technology. Some of the important types of artificially intelligent expert system model (AIES) are given below.

Recursively partitioned decision trees is the first artificially intelligent expert system model (AIES) and it classifies constituting a procedure that repeat itself indefinitely in to a decision tree

on which the end nodes consist of companies of same type failing or non failing companies. (See Frideman,, 1977,, Pompe and Feelders,, 1997).

Case based reasoning(CBR) models is a different way of artificially intelligent expert system model (AIES) that help out to reduce issue of same case occurred before. Case based reasoning programs can be followed for prediction of firm's failure with its application of classical four stage methodology ie: 1) finding issues, 2) recovery of solved cases from a case library, 3) taking on of solved cases to give a solution for the new problem, and 4) assessment of proposed method of solving problems and reference material in other use (Kolodner,, 1993)

Neural network (NN) is is one well known type of artificially intelligent expert system model (AIES) that helps out to conduct the tasks in brain copying processes. The neurons are small nodes having large number of connections which are assembled in a line. Every node in the line act as a processing variable which receive change input than it convert that input into output signals. This afterward send signal to the next node and a linear flow start from one node to the last node which is pre defined (See Salchenberger,, et al,, 1992,, Coats and Fant,, 1993,, Yang et al,, 1999)

Genetic algorithms (GA) rely on Darwinian Theory of natural evolution Genetic algorithms studied as a tadopted technique to find out the solution for a mentioned problem. There are multiple solutions given for this Genetic algorithms which demonstrate the search process in three ways: genetic representation and initialization, selection, and genetic operation . the whole process repeat uptil the point when same strings are converged by right number of population. To find out the solution of firm's failure or bankruptcy the large nuber of rules and regulations are give by researchers by using GAs. These conditions are linked with specific cut-off points. With the help of these conditions it is find out that either that firm will go bankrupt in future again or not (Shin and lee,,2002,, varetto,,1998).

There are rough sketched model is proposed first to check the imprecise or undefined information.

In a rough sets model, the particular understanding about the objects is proposed in an information, table that in effect, works like a decision table consist of sets of condition and decision characters that is used to find out the decision methods of the model by inductive

learning principles. Every new variable or method can then be defined by collaborating these functions with the set of established rules. (Pawalk, 1982, Ziarko, 1993, et al., 1999)

Theoretical model is another type of bankruptcy prediction model. It focuses on detailed reasons of failure. It had found specifically from knowledge that could help out the theoretical disagreement of firm bankruptcy given by the theory. It has multivariate in nature. It is commonly followed a statistical technique to elaborate a quantitative buck up to the theoretical leads.

Theoretical model are of many types that are given below:

Balance sheet decomposition measures (BSDM) entropy theory is one way of finding poor financial condition is to study changes in balance sheet with this fluctuating statement that firms bring a balanced situation in their monetary structure. If a firm's monetary statements copy particular changes in the work of assets and liabilities on its balance-sheet it is more possible that balance sheet is not maintained. And when these controls become out dated or not in hand than future financial loses can be predicted (see theil, 1969; Lev, 1973; Booth, 1983).

Gamblers ruin theory finds out that the firm has thinking to operate the worst situation when net growth goes to zero or chances of loss are high. The unsaid initial amount of cash in any given situation demonstrate that when a firm become bankrupt than its cash flow come negative again and again (scott, 1981 ; Morris, 1998)

Cash management theory focus on the short span of management of company cash balances is a big challenge of every firm. An imbalance between cash inflows and outflows leads to failure of cash management job of the firm, effects of which may result in monetary downfall to the firm and hence, bankruptcy. (See Aziz et al., 1988 Laitinen and Laitinen, 1998)

Credit risk theories are linked to the Basel I and Basel II accords and leads to monetary firms. Credit risk is the risk that any borrower will default, for at all reason. Showing the Basel II rule, a number of new tricks have been made to introduce internal evaluation models of credit risk. These models and their risk assumptions therefore are relied on economic theories of business finance and are jointly known as credit risk theories. (including jp, Morgans credit Metrics, Moody's KMV, model (see Black and Ccholes, 1973)

CSFB,s Credit risk(see, credit, syusse 1997), and kckinseys, CreditPortfolio view,(see wilson,1997a,b, 1998)

The methodology I will be using for Predicting Bankruptcy in cement industry of Pakistan will be Altman Z-Score.

Altman Z-Score

Edward Altman developed a model in 1968 for bankruptcy prediction called Altman Z-score model. This model is also known (MDA) multiple discriminate analysis model. Edward study of bankruptcy prediction presented that mostly bankruptcy reasons is poor management, severe competition, not due to economic recession. Edward Altman use 66 firms in his study, on that half are bankrupt and half non bankrupt. Altman compare bankrupt and non bankrupt organizations in his study. Altman selected five ratios from large number of ratios for bankruptcy prediction. The Edward Altman study result shows 95% accuracy one year prior of bankruptcy and 72% two year before to failure. Edward Altman published the Z-Score formula in 1968 at the Altman was assistant Professor of finance in Newyork University. This formula can used for bankruptcy prediction that the company will be going to bankruptcy in two years. Normally Z-score is used for bankruptcy prediction and financial condition of the business. Z-Score use company financial statements to find bankruptcy and financial strength of the firm. Different industries can use Z-Score model of Edward Altman for predicting bankruptcy. Researchers had used Z-Score model for bankruptcy prediction and financial health of many industries like publically listed companies, service industries and bank. The Z-Score model can be applied the modern economy for bankruptcy prediction up to their year in advance.

Estimation of the formula

The Z-score formula is the combination of five common financial ratios weighted by coefficients. The coefficient had estimated by categorizing different businesses that had confirmed bankruptcy and after this collect similar sample of companies that carry on with same industry and estimated equal size of assets. Altman used statistical method of discriminate analysis for bankruptcy prediction of the collected set of manufacturing companies.

Originally the estimation was based on the data of publically held manufacturers, but the re estimation is based on other data set for the private manufacturer and non manufacturing and service companies.

Altman collect data originally from 66 firms on which half of the companies are filed for bankruptcy. Altman used to predict the bankruptcy of the manufacturing companies and small firms that have assets less the one million were eliminated.

The bankruptcy of the business can be calculated with the help of the following Z-Score formula.

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$$

$$X_1 = \text{Working Capital/Total Assets}$$

This ratio measures liquid assets in relative to the size of the firm. W.C/T.A ratio normally found in studies of business problems and it is a measure of net liquid assets of the company comparative to the all capitalization. Working capital can be calculated by subtracting current liabilities from current assets.

$$X_2 = \text{Retained Earnings / Total Assets}$$

This ration measures profitability of the business that shows the company's age and also the earning power. Firms with more retained earnings compare to total asset have financed their assets through withholding of earnings and have not make use of as much loons.

$$X_3 = \text{Earnings before Interest and Taxes(EBIT) / Total Assets}$$

This ratio shows that how creative a firm in makeincome relative to its size.

$$X_4 = \text{Market Value of Equity (MVE) / Book Value of Total Liabilities (BVL)}$$

This ratio shows that how company assets can become lower before the company became insolvent i.e. liabilities exceed its assets.

$$X_5 = \text{Sales/ Total Assets}$$

This ratio is used to measure the total turnover of the company. Asset turnover shows that the company is how efficiently sale its assets.

Z-Score Ingredients

We can calculate Z-S score by multiplying the coefficient with the ratio and summing the result of five financial ratios. The ratios focus on the following financial measures:

- Working Capital: Working capital can be calculated by subtracting current liabilities from current assets.
- Total Asset: Total asset is present in the Assets section of the Balance Sheet.
- Retained Earnings: Retained earnings are present in the Equity section of the Balance Sheet of the company.
- Earnings before Interest and Taxes (EBIT): EBIT is equal to operating income or operating loss of the business that is available at the income statement of the business.
- Market Value of Equity: Market value of equity is equal to the multiplication of all shares with its market price.
- Net Worth: Net worth is also called Shareholders Equity or simply Equity. It can be calculated by subtracting total liabilities from total assets.
- Book Value of Total Liabilities: Book value is equal to the sum of current noncurrent and long term liabilities that is present in the balance sheet. Sales: Sales includes other income normally classified as revenues in the companies Income Statement.

Zones of Discrimination

$Z > 2.99$ = Safe Zones: The company is considered safe because there is low risk to default.

$1.81 < Z < 2.67$ = Grey zones: Shows the financial soundness but have high risk of default

$Z < 1.81$ = Distress Zones: and signifies as failed firms or firms in distress zone.

Accuracy of Altman's Z-Score

Altman report that his model identified 95% of total first sample correctly from statement one year before their bankruptcy, when it becomes 2 year it is 72% accurate. To test accuracy further, Altman used a second sample, in the second sample the model was 96% correct.

Bankruptcy Prediction through Altman Z-Score

Z-Score bankruptcy prediction model shows that whether the business will going to bankruptcy or not within two year prior to bankruptcy. For this purpose Edward Altman proposed the following zones of discrimination. When the Z value is equal or greater than 2.99 then it means that the company is non bankrupt and in the safe zone. When the Z value is grater then 1.8 and less than 2.99 then than the company as in gray zone means that the company financially sound but have high risk of default or bankruptcy. When the Z value is less than 1.8 it means that the firm as in distress zone or shows that the company is financially not sounds and bankrupt.

These zones are to find out that weather the cement industry in Pakistan is financially sound or going to bankrupt. For bankruptcy prediction I use the Altman Z-score model and the Z-Score results are shown in the following tables.

Table 1 shows the Z-Score results of DG Khan Cement Company limited. The Z-Score value less than 1.8 in 2010 that shows that the company is in distress zone. In 2011 and 2012 the company is in gray zone that shows that the company financially stable but have highrisk to become bankrupt. In 2013 and 2014 the Z value is grater then 2.99 that means that the company as in safe zone and financially stable.

Table 1: DG khan Cement

DG KHAN CEMEN T						
Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
1.510	0.056	0.005	0.048	1.553	0.346	2010
1.843	0.113	0.005	0.115	1.265	0.462	2011
1.995	0.143	0.054	0.000	2.160	0.453	2012
4.157	0.259	0.227	0.127	4.527	0.392	2013
6.713	0.357	0.203	0.115	8.764	0.362	2014

Table 2 shows the Z score results for the Thatta cement company ltd. In 2010 the Z value is 2.9 that shows that the company is an safe zone and financially stable. It is also means that

Thattacement is managed well in 2010. Z-score result in 2011 and 2012 shows that the company is in gray zone. It means that the company is in a good position but has a high chance of bankruptcy. In 2013 and 2014 the Z value is greater than 2.99 that shows that the company is in a safe zone and financially strong and has a good position in the market.

Table 2: Thatta Cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
2.950	0.010	0.003	0.028	2.945	1.074	2010
2.157	0.093	-0.037	-0.019	2.049	0.932	2011
2.362	-0.041	-0.021	0.035	1.988	1.133	2012
4.415	0.019	0.068	0.160	4.494	1.075	2013
3.680	0.043	0.084	0.183	3.619	0.735	2014

In Table 3 Z value shows that Attock Cement Company is in a good financial position and it maintains its position in a safe zone in all 5 years. It shows that their financial position and financial performance is very good because it maintains their management and financial position stable and progressive during the 5 year period of analysis.

Table 3: Attock cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
4.941	0.245	0.121	0.208	4.513	1.086	2010
3.782	0.125	0.038	0.137	3.373	1.105	2011
5.013	0.227	0.137	0.230	4.326	1.195	2012
5.830	0.276	0.172	0.251	5.592	1.075	2013
6.460	0.188	0.134	0.223	7.098	1.052	2014

Table 4 shows the Z-Score results of Maple Leaf cement company that shows that the from 2010 to 2013 the company is going to bankrupt because it is in distress zone in these 4 years of analysis. The main reason that Maple Leaf Company distresses zone is working capital. In 2010 to 2013 the working capital of this company is negative means that the current liabilities are more than the current assets. But in 2014 the Maple Leaf Company shift from distress zone to gray zone. It means the in 2014 the company become financially stable but has high risk of bankruptcy.

Table 4: Maple leaf cement

Z-Score	X1(W.C/T.A)	X2(R.E/T.A)	X3(EBIT/T.A)	X4(MVE/BV L)	X5(SALE/T.A)	Year
0.252	-0.166	-0.101	0.002	0.107	0.522	2010
0.175	-0.147	-0.062	0.004	0.063	0.388	2011
0.750	-0.144	0.015	0.085	0.246	0.472	2012
1.556	-0.058	0.100	0.150	0.758	0.536	2013
2.139	0.000	0.089	0.158	1.496	0.594	2014

Table 5 shows the Z-score results of Facto cement company ltd. In this table the Z values shows that the Facto cement in 2010 and 2011 company is in distress zone because z values are less than 1.8. it means that company is financially un stable in these two years and going to b bankrupt. But in 2012 the company shifts from distress zone to gray zone. It shows that the company is going to b financially stable but has high risk of bankruptcy. In 2013 and 2014 the company shift from gray zone to safe zone that shows that the company became financially stable in these 2 years and have a good financial position.

Table 5: Facto cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
0.811	-0.127	0.067	-0.071	0.294	0.930	2010
1.231	-0.192	0.021	0.076	0.202	1.063	2011
2.241	-0.156	0.090	0.156	0.794	1.312	2012
3.639	0.024	0.151	0.245	2.041	1.366	2013
4.371	0.229	0.140	0.213	3.308	1.213	2014

The following Table 6 shows that during period 2010 and 2011 the Kohat cement company is in distress zone. It means that the financial position of the company is weak and the company is going to bankrupt. But in 2012 the Kohat cement company shift from distress zone to gray zone that means that the Kohat cement company becomes financially stable but have high risk of bankruptcy. So company further stable there financial position and shifted from gray zone to safe zone in 2013 and 2013. So it means that the Kohat cement is stable and strong financial position during 2013 and 2014 and have no chance of bankruptcy.

Table 6: Kohat cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
0.302	-0.212	-0.038	0.030	0.143	0.426	2010
0.960	-0.094	0.007	0.092	0.156	0.667	2011
2.799	-0.063	0.138	0.297	1.150	1.011	2012
4.398	0.170	0.184	0.372	2.771	1.047	2013
7.580	0.233	0.223	0.320	8.385	0.902	2014

Table 7 results i.e. $Z < 1.8$ of Z-score shows that the Power (Al-Abbas) cement company is an distress zone during 5 year period of analysis. It shows that the company is not managed

efficiently. These results of Edward Altman Z-Score model shows that the company will be bankrupt very soon.

Table 7: Power (Al-Abbas) cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
-0.047	-0.174	-0.136	-0.062	0.238	0.415	2010
-0.037	-0.125	-0.179	-0.067	0.262	0.430	2011
1.535	0.154	0.030	0.134	0.503	0.565	2012
1.398	-0.139	0.066	0.145	0.614	0.625	2013
0.957	-0.144	-0.013	0.041	0.682	0.604	2014

Table 8 results i.e $Z < 1.8$ of Z-score shows that the GharibWall cement company is an distress zone during 5 year period of analysis. It shows that the company is not managed efficiently. These results of Edward Altman Z-Score model shows that the company will be bankrupt very soon.

Table 8:Gharibwal cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
-0.242	-0.311	0.000	-0.072	0.341	0.164	2010
-0.004	-0.341	0.000	-0.014	0.308	0.266	2011
0.273	-0.340	0.000	0.063	0.348	0.264	2012
1.245	-0.165	0.000	0.142	0.819	0.483	2013
1.521	-0.128	0.000	0.135	1.113	0.563	2014

Table 9 results i.e $Z < 1.8$ of Z-score shows that the Fauji cement company is an distress zone during 2010 and 2011. It shows that the company is not managed efficiently and the company is financially unstable and will be bankrupt soon. But in 2012 it shift from distress zone to safe zone i.e $Z > 2.99$. This shows that Fauji manage efficiently and became stable. In 2013 the company again shift from safe zone to gray zone and in 2014 fauji cement again shift from gray zone to safe zone. That means that the company managed and operating effectively and have no chancy of bankruptcy.

Table 9:Fauji cement

Z-Score	X1(W.C/T.A)	X2(R.E/T.A)	X3(EBIT/T.A)	X4(MVE/BVL)	X5(SALE/TA)	year
0.303071	-0.071479	0.0074689	0.0136713	0.250658	0.183062	2010
0.159089	-0.018398	-0.125025	0.022974	0.168111	0.1797	2011
3.381791	0.0632492	0.2389817	0.4953491	0.188089	1.225038	2012
2.681865	-0.117822	0.0839558	0.4225671	0.357127	1.098063	2013
2.301534	0.0240238	-0.008973	0.1180124	2.166182	0.596715	2014

Table 10 results i.e $Z < 1.8$ of Z-score shows that the Dandot cement company is an distress zone during 4 year period of analysis ie in 2010,2011,2012 and 2014. While in 2013 the company is in gray zone. It shows that the company is not managed efficiently. These results of Edward Altman Z-Score model shows that the company will be bankrupt very soon.

Table 10:Dandot cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
-1.045	-0.502	-0.158	-0.112	0.104	0.085	2010
-0.834	-0.531	-0.117	-0.129	0.042	0.369	2011
-1.159	-0.739	-0.184	-0.177	0.099	0.511	2012
-1.815	-1.003	-0.173	-0.165	0.182	0.067	2013
-1.307	-1.007	-0.184	-0.146	0.273	0.476	2014

Table 8 results i.e $Z < 1.8$ of Z-score shows that the GharibWall cement company is an distress zone during year period of analysis. It shows that the company is not managed efficiently. These results of Edward Altman Z-Score model shows that the company will be bankrupt very soon

Table 11: Lafarage Cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
0.2304	-0.3368	-0.0486	0.0032	0.5662	0.3528	2010
0.8276	-0.0539	-0.0062	0.0506	0.5466	0.4061	2011
1.4180	-0.0718	0.0762	0.1175	0.8625	0.4928	2012
2.2205	-0.0018	0.0698	0.0969	2.1592	0.5101	2013
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2014

In table 12 the Z-score results shows that Pioneer Cement Company is in distress zone from 2010 to 2012. So according to this result the company is going to bankrupt. But in 2013 the company

shift from distress zone to gray zone. It means that the company managed efficiently and has sound financial position but has bankruptcy risk. In 2014 the company shift to safe zone that shows that company is financially strong and has no chance of bankruptcy.

Table 12: Pioneer cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
0.310	-0.346	-0.057	-0.008	0.526	0.516	2010
0.709	-0.327	0.012	0.055	0.329	0.705	2011
1.314	-0.327	0.061	0.143	0.741	0.705	2012
2.689	0.023	0.108	0.192	1.810	0.791	2013
4.245	0.108	0.096	0.215	4.328	0.676	2014

Table 13 results i.e $Z < 1.8$ of Z-score shows that the Flying cement company is in distress zone during 5 year period of analysis. It shows that the company is not managed efficiently. These results of Edward Altman Z-Score model shows that the company will be bankrupt very soon.

Table 13: Flying cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
-0.029	-0.010	-0.031	-0.031	0.192	0.015	2010
0.001	-0.047	-0.027	-0.033	0.115	0.133	2011
0.157	-0.081	0.005	-0.033	0.202	0.234	2012
0.235	-0.105	0.002	-0.003	0.377	0.144	2013
0.265	-0.127	0.017	0.012	0.535	0.034	2014

Table 14 shows Z-core results of Cherat Cement. In table 14 the Z value is less than 1.8 that shows that Cherat cement is in distress zone and will be bankrupt soon. But in 2012 and 2013 the Z-score results shows that the company is in safe zone have no chance of bankruptcy. CheratCement Company manages well and has sound financial position

Table 14: Cherat cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
1.150	-0.079	-0.003	-0.028	1.046	0.714	2010
1.389	-0.015	0.013	0.064	0.649	0.791	2011
4.268	0.227	0.161	0.230	3.028	1.195	2012
8.501	0.148	0.242	0.334	9.403	1.243	2013
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2014

In Table 3 Z value shows that Lucy Cement Company is in a good financial position and it maintain its Position in Safe Zone in all 5 years. It shows that their financial position and financial performance is very good because it maintain their management and financial position stable and progressive during the 5 year period of analysis.

Table 15: Lucky Cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
2.771	-0.072	0.048	0.111	2.778	0.758	2010
2.857	-0.030	0.065	0.117	2.742	0.771	2011
6.833	0.146	0.135	0.211	8.018	0.963	2012
9.570	0.183	0.155	0.235	12.481	0.871	2013
13.512	0.253	0.146	0.000	20.239	0.860	2014

Table 16 results i.e $Z < 1.8$ of Z-score shows that the Dewan cement company is a distress zone during 5 year period of analysis. It shows that the company is not managed efficiently. These results of Edward Altman Z-Score model shows that the company will be bankrupt very soon

Table 16: Dewan Cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
0.714	0.260	-0.030	-0.029	0.623	0.167	2010
-0.094	-0.249	-0.018	-0.017	0.063	0.247	2011
0.200	-0.235	0.003	0.021	0.124	0.335	2012
1.434	0.673	0.018	0.020	0.227	0.401	2013
#VALUE! E!	-0.132	0.019	#VALUE!	0.280	0.426	2014

Table 17 shows Z-core results of Bestway Cement. In table 14 the Z value is less than 1.8 from 2010 to 2013 that shows that Bestway cement is in distress zone and will be bankrupt soon. But in 2013 the Z-score results show that the company is in safe zone have no chance of bankruptcy. Bestway Cement Company manages well and has sound financial position in 2013.

Table 17:Bestway Cement

Z-Score	X1(W.C/T. A)	X2(R.E/T. A)	X3(EBIT/T. A)	X4(MVE/BV L)	X5(SALE/T A)	Year
0.538	-0.153	-0.043	0.020	0.402	0.474	2010
0.821	-0.154	0.006	0.099	0.362	0.453	2011
0.944	-0.101	0.106	2.027	1.444	#VALUE!	2012
3.000	0.030	0.129	0.207	2.495	0.604	2013

Chapter4: RESULTS AND DISCUSSION

By screening the whole study we found some points which is expressed as major findings of my study. From Z-Score results of bankruptcy prediction I found that that there is 30 % companies in cement industry is in distress zone consider to be bankrupt, 17 % companies is gray zone means that have high risk of bankruptcy and 53% in safe zone and is non bankrupt. So this shows that the majority of the cement companies have sound financial condition but still there are bankrupt companies in the cement industry. The DG khan cement company in 2010 and 2011 has Z-score value has less than 1.8 that shows that it going to be bankrupt soon and have in distress zone and have bad financial position. But after this financial condition of the DG Khan company became sound and shift from gray zone and then shift from gray zone to safe zone, that shows that the DG khan cement have managed efficiently and have sound financial situation and manage efficiently.

Z-Score results of Thatta cement shows that the company are not bankrupt and have not bankrupt have sound financial condition through the 5 year period of analysis because its Z-score value is shows that the company is in gray zone in 2011 and in safe zone in 2010,2012,2013 and 2014.

Z-Score results of Attock cement shows that the company are not are not bankrupt have sound financial condition through the 5 year period of analysis because its Z-score value is shows that the company is in safe zone throughout the 5 year period of analysis. The reason of the sound financial condition of the Attock cement is they have high working capital and have high profitability and have high market value because it manages efficiently.

Maple leaf cement result of 2010 to 2013 i.e. $Z = 0.251947, 0.174623, 0.749502, 1.555815$ shows that the company is in distress zone and soon to be bankrupt. Because Z-score area of discrimination shows that those companies who have Z value is smaller than 1.8 consider is bankrupt companies. The main reason of the bankruptcy is it has negative working capital i.e. more current liabilities then its current assets and have low market price. After 2013 the current assets increased from current liabilities and its market price of shares also increases so it shifts from distress zone to gray zone, shows that company manage efficiently but still have high risk of bankruptcy. Facto cement Z value of 2010 and 2011 i.e. .811 and 1.23 shows that it is in distress zone and soon to be bankrupt but in 2012 Facto cement manage efficiently and make

their financial condition stable. In 2012 $Z= 2.24$ shows that it is in gray zone and in 2013 and 2014 $Z=3.64$ and 4.37 shows that the company is in safe zone and have sound financial condition

Z-score result of Kohat cement shows that in 2010 and 2011 it is in distress zone and will be going to bankrupt soon because it these two year Kohat cement company have more current liabilities from its current assets and have low market price of its shares. In 2012 to 2014 the Z value is grater then 2.99 that shows that it is in safe zone and has sound financial position and has no chance of bankruptcy

Power (Al-Abbas cement) cement result of 2010 to 2014 i.e. $Z= 0.04742, 0.03736, 1.535067, 1.397552$ and 0.956593 shows that the company is in distress zone and soon to be bankrupt. Because Z-score area of discrimination shows that those companies who have Z value is smaller than 1.8 consider is bankrupt companies. The main reason of the bankruptcy is it has negative working capital i.e. more current liabilities then its current assets and have love market price.

Gharibwall Cement company result of 2010 to 2014 i.e. $Z= 0.24211, 0.00439, 0.273007, 1.24522$ and 1.520961 shows that the company is in distress zone and soon to be bankrupt. Because Z-score area of discrimination shows that those companies who have Z value is smaller than 1.8 consider is bankrupt companies. The main reason of the bankruptcy is it has negative working capital i.e. more current liabilities then its current assets and have love market price.

Fauji Cement Z-Value of 2010 and 2011 i.e. 0.303071 and 0.159089 shows that it is in distress zone and soon to be bankrupt but in 2012 Fauji cement manage efficiently and make their financial condition stable. In 2012 $Z= 3.381791$ shows that it is in safe zone and in 2013 and 2014 $Z=2.681865$ and 2.301534 shows that the company is in gray zone and have sound financial condition but have high risk of bankruptcy

Dandot Cement company result of 2010 to 2014 i.e. $Z= -1.04522, -0.83393, -1.15943, 1-.81494$ and -1.3073 shows that the company is in distress zone and soon to be bankrupt. Because Z-score area of discrimination shows that those companies who have Z value is smaller than 1.8 consider is bankrupt companies. The main reason of the bankruptcy is it has negative working capital i.e. more current liabilities then its current assets and have love market price

Lafarage cement Z value of 2010, 2011 and 2012 i.e. 0.230409, 0.827563 and 1.417983 shows that it is in distress zone and soon to be bankrupt but in 2013 Lafrage cement manage efficiently and make their financial condition stable. In 2013 $Z= 2.22$ shows that it is in gray zone and in 2014 $Z= 3.22$ shows that the company is in safe zone and have sound financial condition.

Pioneer cement Z value of 2010, 2011 and 2012 i.e. 0.310086, 0.708586 and 1.31402 shows that it is in distress zone and soon to be bankrupt but in 2013 Pioneer cement manage efficiently and make their financial condition stable. In 2013 $Z=2.68938$ shows that it is in gray zone and in 2014 $Z= 4.245243$ shows that the company is in safe zone and have sound financial condition.

Flying Cement company result of 2010 to 2014 i.e. $Z= 0.02872, 0.000978, 0.157139, 0.234607$ and 0.264792 shows that the company is in distress zone and soon to be bankrupt. Because Z-score area of discrimination shows that those companies who have Z value is smaller than 1.8 consider is bankrupt companies. The main reason of the bankruptcy is it has negative working capital i.e. more current liabilities then its current assets and have love market price.

Cherat Cement Z-Value of 2010 and 2011 i.e. 1.149509 and 1.388954 shows that it is in distress zone and soon to be bankrupt but in 2012 Cherat cement manage efficiently and make their financial condition stable. In 2012 and 2013 $Z= 4.268157, 8.501192$ shows that it is in safe zone and have no chance of bankruptcy

Altman Z-score result of Lucky Cement Company shows that in 2010 and 2011 it is in gray zone and from 2012 to 2014 Lucky Cement Company are in safe zone that shows that the lucky cement company has stable financial position.

Dewan Cement company result of 2010 to 2014 i.e. $Z= 0.714481, -0.09444, 1.434284, 1.24522$ and 1.520961 shows that the company is in distress zone and soon to be bankrupt. Because Z-score area of discrimination shows that those companies who have Z value is smaller than 1.8 consider is bankrupt companies. The main reason of the bankruptcy is it has negative working capital i.e. more current liabilities then its current assets and have love market price.

Bestway Cement Z-Value of 2010 and 2011 i.e. 0.537829 and 0.821105 shows that it is in distress zone and soon to be bankrupt but in 2012 Bestway cement manage efficiently and make

their financial condition stable. In 2012 $Z= 3.381791$ shows that it is in safe zone and have strong financial condition and have no chance of bankruptcy.

Conclusion:

The business failure prediction is very useful for investors, financial managers and other users of financial statements. In this study we analyze all 18 Cement sector companies listed in Karachi stock Exchange to assess the financial health and bankruptcy by using Edward Altman Z-Score bankruptcy prediction model.

Results shows that Altman Z-score model is good predictor for bankruptcy prediction and assessing the financial failure of the Cement sector companies listed at (KSE) Karachi Stock exchange. Bankruptcy prediction results in the Cement industry of Pakistan show that there are bankrupt companies in the cement industry of Pakistan.

This model can use also for bankruptcy prediction in other sectors. Company management and Portfolio managers when using this model they can predict upcoming future problems for organization.

Moreover, it is found that that 30 % companies in cement industry are in distress zone i.e. consider to be bankrupt companies, 17 % companies are in grey zone which implies that have high risk of bankruptcy and 53% in safe zone and considered to bein safe zone, i.e., no fear of bankruptcy. Thus this shows that the majority of the cement companies have sound financial condition but still half of them are either bankrupt or at higher risk of bankruptcy in the cement industry.

RECOMMENDATIONS

All Pakistan Cement Manufacturing Association (APCMA) should;

- take the intensive care of those firms which are in distress zone or in grey zone for the last five years
- companies should pay special concentration to increase their profitability.
- manage their costs and expenses efficiently to shift in the safe zone from the distressed or gray zone.

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