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FINANCIAL PERFORMANCE ANALYSIS OF PAKISTAN BANKING SECTOR USING THE ALTMAN Z SCORE MODEL OF CORPORATE BANKRUPTCY

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ABSTRACT

Commercial Banks are the most important contributor in the economic development of a country having a huge impact on capital and credit markets of the country. The aim of this study is to explore if commercial banks have financial difficulties. Data was gathered from commercial banks which were listed on Karachi Stock Exchange for the period 2009 to 2013. The results illustrate that all commercial banks in this model are in monetary troubles but in fact, those commercial banks are operating successfully. So, the Z score model is unable to predict bankruptcy (pecuniary Performance) of financial institutions (Commercial Banks).

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1. INTRODUCTION

Commercial banking segment has strong effect on the economy of a country. The basic role of this segment is to make the overall financial system attractive, pull the economy out of intercession and encourage economic dealings that are essential for the economy of the country [1]. Therefore a bank can be defined as “an economic & financial organization that trades through the cash of investors, and aims to act as a financial agent between the public who contain an additional sum of money (depositors) and the people who contain a shortage to envelop their financial desires of borrower”. [2]

Commercial banks are the financial institutions which collect idle money of the people and give loans to businesses and households. These banks also provide a number of services to their customers. Commercial banks play very important role in economic development of any country. Especially in developing countries like Pakistan, where there is shortage of capital, commercial banks become more important. They help both consumers and businesses to raise funds to meet their needs. Keeping in view the importance of commercial banks, we have selected the banking industry in our research. Altman Z score model is used in the direction of determining the financial status of different commercial banks of Pakistan. The original Z score model developed in 1968, was initially applied on publically traded companies. Then this model was revised in 1977. Then it is further revised to apply it on non-manufacturing businesses and emerging markets. In Z score model different banks may fall in different categories. Banks having Z score more than 2.99 are considered to be very healthy, having no chance of bankruptcy. Banks having Z score less than 1.81 are considered to fall in bankruptcy zone, thus having very poor performance. The region in between 1.81 and 2.99 is considered to be grey area having healthy performance.

2. SCOPE OF THE STUDY

This study investigates the usefulness of Z score model based on publicly available information of six commercial bank's balance sheets. Altman's Z score formula was used to assess the monetary health of the

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commercial banks and diagnose the chances of bankruptcy. The Z score model uses various accounting ratios to predict the future bankruptcy. And also provides a quantitative measure to detect weaknesses early and build confidence to make policies and plan to overcome consequences.

3. OBJECTIVES OF THE RESEARCH

Followings are the objectives of this study.

- The main and the most prime purpose of the study is to judge the financial performance of the banking sector of Pakistan by using Altman Z score model of corporate bankruptcy.
- To evaluate the financial performance of various banks in Pakistan.

4. LITERATURE REVIEW

This part represents the relevant studies previously completed by distinctive researcher in diverse countries at different point in time period. Next, mutually hypothetical and empirical framework is mentioned for providing the financial performance analysis of Banking Sector in Pakistan.

The study conducted on the financial performance analysis and its impact on stock price of banks in Indonesian Stock Exchange. The author's objectives are that to discover whether banks include financial troubles and its effect on companies' stock price. In research studies they used data for the period from 2004 to 2008 of the listed companies in Indonesian Stock Exchange. To evaluate the result the Z score model is used. They concluded that banks fell in financial difficulty but in reality these banks are still operating their activities normally. This concluded that Z score did not significantly affect the stock price [3]. A recent study was conducted on financial performance of banking sector of Pakistan. However the focus of the study was to compare the performance of different banks rather than using Altman Z score to measure bankruptcy [4].

A research conducted on predictive power of financial risk factors in default companies. To evaluate the analysis he combined various ratios through statistical techniques. In this study three forms of Z score are applied. The first form is developed by internal credit rating models of the Indian banks and the ratios which used are: current ratio, debt to owner equity ratio and operating margin ratio. In second form, the original equation was slightly modified --market value of equity to debt ratio was replaced by debt to book value of equity. In last form is called Altman, Hartzell and Peck's emerging market model. All the ratios of second form are used except asset turnover ratio. He concluded that first and second form of equation is 82 percent accurate while the first equation is 57 percent accurate. This identifies that current ratio and debt to equity ratio are poor at predicting the default companies. Therefore, for credit analysis, investors (creditors) modify the Z score model to find the bankruptcy of the banks [5].

A research conducted on predicting the corporate bankruptcy of Jordanian listed companies. They took non-financial institutions and corporate companies for their study. The study sample included non-financial institution for the period 1990 to 2006. To achieve the objective of the study, the Altman Z score model and Kida models were used as techniques to find the bankruptcy of the non-financial institutions and corporate companies. The result of both Z score model & Kida models identified that Z score model results are 93.8 percent significant while the Kida models is 69 percent. One of these models is significant to forecast the insolvency of Jordanian listed companies [6].

Study examined on to measure the financial strength of the Indian oil corporation limited by using Altman Z score model. According to calculation, the Z score of Indian Oil Corporation is 1.8528, which shows that financial health of the company is good and there is no chance of business failure in near future [7].

The study was conducted on financial soundness of Indian banks. To evaluate the soundness of India banking industry, they applied the Altman Z score model. Beside two exceptions, they found the financial conditions of the Indian Banks as adequate; one of them was Canara bank among the public sector banks and the other was Kotak Mahindra bank among the private banks which were found in financial distress. While the capital adequacy ratio of both banks was sound enough as compared to other banks [8]. They suggest the use of hybrid model to make any certain remark to the soundness of any organization [8].

This study examined the revaluation effect of Altman's Z-score on the Serbian Capital Market. Revolutions are associated with reasonable value of accounting which predict intrinsic and market price of property equipment and plants.

The aim of the authors is to establish how significant is the impact of revaluation on Z score model. They concluded that surface changes cannot increase the accuracy of the Z score model. Other researchers also previously rejected Z score functions in Serbia Capital markets [9].

It carried out a study on the design & development of credit rating scoring for the commercial banks in Pakistan that predict forecasting of creditworthiness of corporate borrowers. This study used credit scoring

model for corporation (CSMC) which is used by investors to find the earlier financial performance of the organization to invest money in that organization in which the investors are interested. Altman Z-Score model was part of the credit scoring model for corporation. The data which are taken used by thirty corporate borrower of discarded and received from chemical and textile industry of Pakistan. The results of all the developed credit scoring models were compared and analyzed with the statistical credit scoring techniques known as logistic regression and discriminatory analysis. Type I and type II errors were calculated for all the credit scoring models used. The results show that the proposed model (CSMC) has more accuracy rate with no errors as compared to LR and DA.

The comparison between the creditworthiness of textile & chemical industry was made and it was concluded that there is no difference in their creditworthiness & probability of default. Also they gave several suggestions for further researches [10].

The study conducted on the financial performance analysis of Kenya's SACCO Sector. The authors took data from 2008 to 2013 and found variable X1 and X4 as stronger and other variables equally contributing to the scoring. They concluded that some companies of SACCO lie in satisfactory area, while some fall in gray area and others falls in the very satisfactory and healthy sectors [11].

The researchers conducted a study to review the financial soundness of cement industry of Bangladesh b using Altman Z score model. The results of this study show that two of the firms are sound financially. One firm falls in grey area and two firms are not in a good position [12].

A study conducted on applicability of Altman's Revised Predicting Financial Distress: A Case of PN17 companies Quoted in Malaysian stock exchange. The study took data from Malaysian stock exchange of 52 listed companies under PN17.

These companies are listed under PN 17 in accordance with the standard of these companies. In Malaysian Stock Exchange, the companies are in financial trouble or have failed to meet minimum capital which is less than 25 percent of the paid up capital. Different methods can be used to find the reason of these companies' failure. As of 9th August 2010, still thirty-four companies listed on Malaysian Stock Exchange classified under the PN 17 list. The data was taken from 2003 to 2010. The study found that PN17 companies are financial failure companies. Hence, Altman Z score can be used to detect financial distress of a company. [13].

5. HYPOTHESES OF THE STUDY

From the above literature review, we drive following hypotheses:

1. Null Hypothesis (H_0): Altman model is incapable to forecast insolvency of financial institutions.
2. H_1): Altman model is capable of forecasting insolvency of financial institutions.

6. RESEARCH DESIGN AND METHODOLOGY

The research design is to underline in technical terms that what is done [11]. The research design is quantitative in nature and relies on financial data which are collected from 2009 to 2013. This is used in analysis to evaluate the financial performance of the commercial banks in Pakistan.

The population of this study is the commercial banks only. In this study, six commercial banks are taken as sample which are National Bank of Pakistan, MCB Bank, United Bank limit , Habib Bank Limited, Bank Al Falah bank Limited and allied Bank Limited.

These banks are selected because the Total Assets of these banks are high in 2013. In other words we can say that these Banks have top six positions on the basis of total assets in 2013. Besides, the study is based on secondary statistics which was gathered from the website of Karachi Stock Exchange, Federal Bureau of Statistics, Yahoo Finance and CSC Trade.

The financial ratios and numbers were afterward extracted from the yearly information of public shareholding companies and from the report of financial institutions of SBP 2009-2013. In order to organize the data and attain the goals of the study, expressive statistical analysis and Altman's Z score model were applied to evaluate the commercial banks financial statements.

6.1. Altman Z score Model

Altman's Z score developed in 1968 and this model was used in predicting business insolvency. The model is also known as Z score model.

Z score intended for a business is the middling of five disconnect financial ratio; the ratios are represent in the subsequent method.

$$Z = 1.20X1 + 1.40X2 + 0.30X3 + 0.60X4 + 1X5$$

Z= weighted mean

X1= (current ratio – current liability) / Total Assets Ratio

X2= Retained earnings to Total asset ratio

X3= Earnings before interest & taxes (EBIT) to Total Assets

X4= Marketing capitalization to original price of liability

X5 = Sales to Total Assets

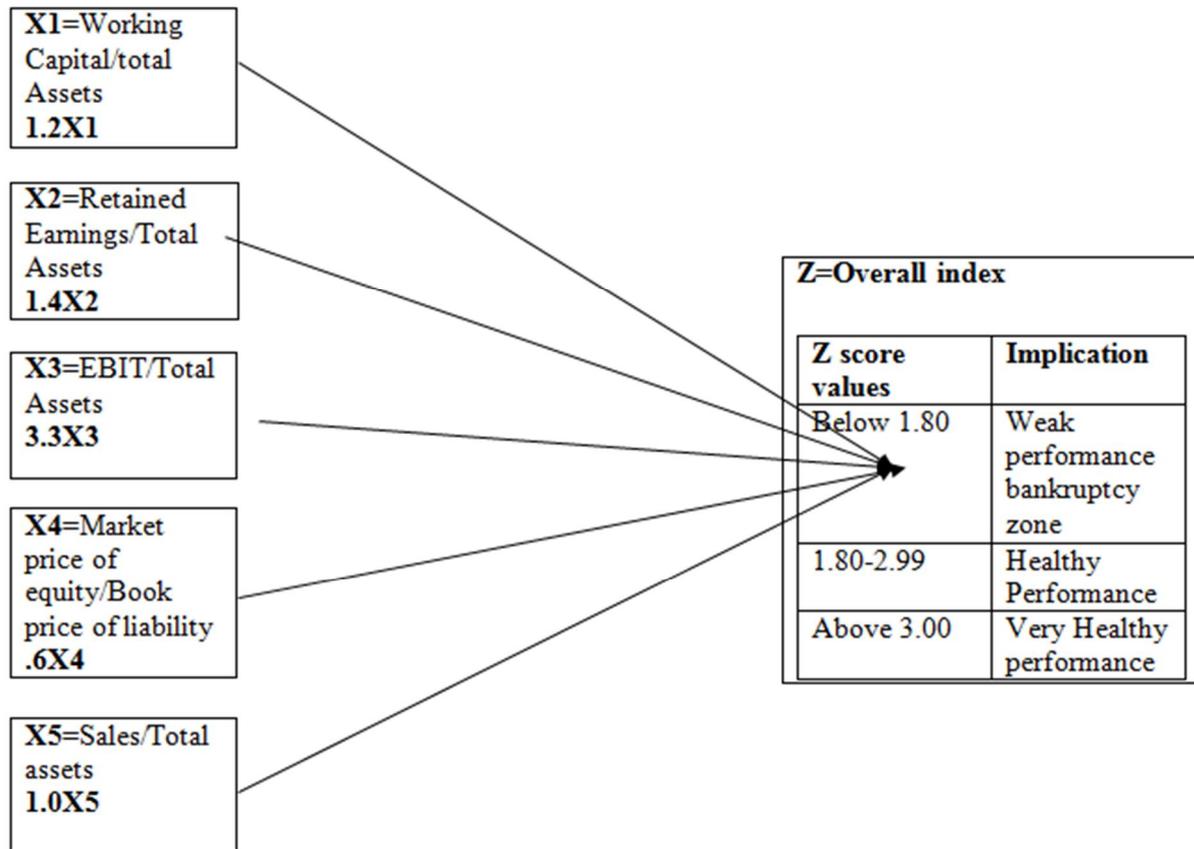


Figure 1 Conceptual Framework
Adopted from Kivuvu & Olweny (2014)

Current Assets minus Current Liabilities to Total Assets ratio estimates company's ability to cover financial obligations. Retained Earnings to Overall Assets Ratio measures how many the part of profit is invested in the business as compared to Total Assets.

Earnings before Interest & Taxes (EBIT) to Total Assets ratio depict the managerial efficiency in terms of profitability of the business. The market value of capital to Total Liability ratio expresses the financial leverage i.e., how many equity and liability are used to finance the asset of the company. While sales to total assets ratio shows how effectively and efficiently the financial institution utilizes its assets to generate sales.

The Altman's Z score model shows that institutions that have Z score value bigger than 2.99 obviously will drop on non-insolvent segment. Banks having Z score less than 1.8 will fall in the bankrupt segment and finally the area between the 2.99 and 1.8 is known gray area which is also known zone of ignorance.

In this model, there is one variable which is dependent while five are independent variables: Z score is dependent while X1, X2, X3, X4 and X5 are independent variables.

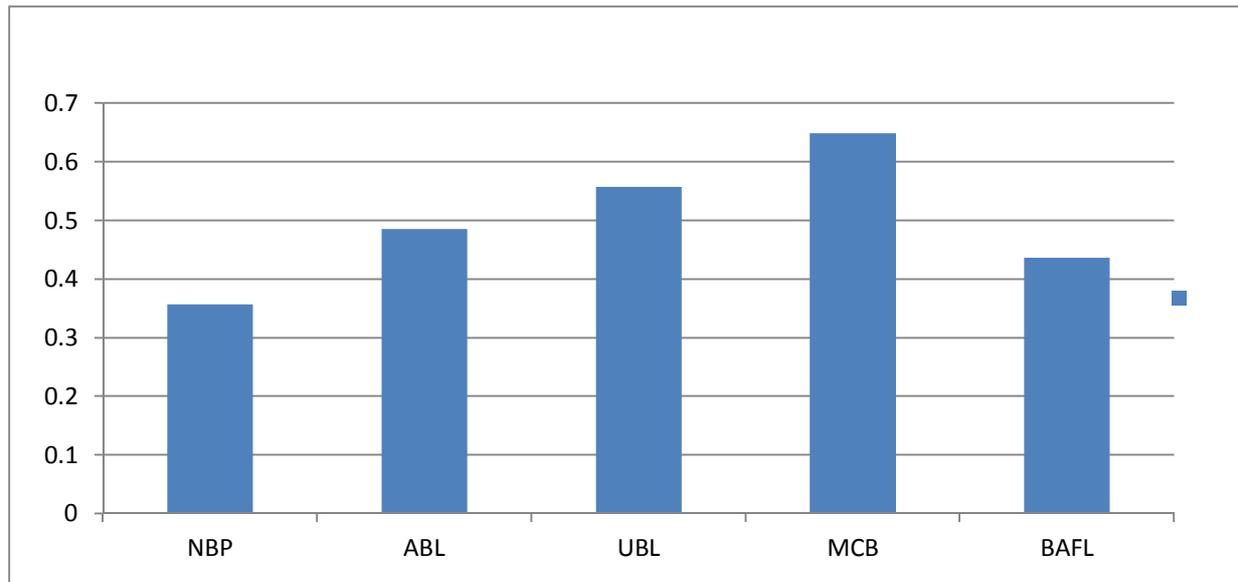
7. DATA ANALYSIS AND FINDING

Data was collected and distinguished and analysis of the key variables was undertaken. The selective variables of liquidity, profitability, leverage, solvency, and activity ratios were analyzed using the Altman 'Z' score in order to arrive at the study findings. An integration of both qualitative and quantitative methods was relied upon in the course of this study.

The data obtained was subjected to various computations and analysis. In the analysis, percentages, ratios, and tabulations are done and appropriate references have been drawn. The analysis of the quantitative data was done by using excel spreadsheets.

Table 1 Analysis of the quantitative data (Z score values)

Name of the Banks	Z score values				
	2010	2011	2012	2013	Average value
National Bank of Pakistan (NBP)	0.416914	0.377563	0.33668	0.298241	0.357349
Allied Bank Limited (ABL)	0.55824	0.4838	0.458838	0.442073	0.485727
United bank Limited (UBL)	0.547661	0.56291	0.553961	0.567797	0.558082
Muslim Commercial Bank Limited (MCB)	0.679294	0.619096	0.619686	0.6787	0.649194
Bank Al Falah limited (BAFL)	0.426047	0.448519	0.439231	0.43349	0.436822
Habib Bank Limited (HBL)	0.636545	0.634334	0.499685	0.5155	0.571516

**Figure 1**

This study concluded that the National Bank of Pakistan (NBP), United Bank Limited, Muslim Commercial Bank Limited, Allied Bank Limited, Bank Al Falah Limited, and Habib Bank Limited lie in the bankruptcy segment because all have Z score less than 1.8. Yet all commercial banks are operating their activities normally. But according to the report of state bank of Pakistan for the period 2009 to 2013, the financial performance of these commercial banks is good. In our analysis, we have studied that each specific rating model presents different rating score which shows that same organization can be evaluated as high solvent by one model and other model achieved high probability of default risk. On the basis of it, we reject our alternative hypothesis that Z score model is able to predict bankruptcy of financial institutions (Commercial Banks). The study suggests the use of hybrid model to make any conclusive remark to the soundness of any company. Different authors also concluded same results [3].

7.1. Revised Altman Z Score Model

Altman, Hartwell, & Peck in 1995 formed the promising market scoring form to evaluate the economic health of banking sectors. Here Z score for an institution is mean of four part financial ratio; the ratios are represented in the subsequent procedure.

$$Z = 6.560 X_1 + 3.260 X_2 + 6.720 X_3 + 1.050 X_4$$

X₁ = Current assets minus Current liability to Total assets

X₂ = Retained Earnings ratio to Total assets ratio

X₃ = Earnings before Interest and Taxes to Total Assets.

X₄ = Book Value of capital to Book Value of Total Debts.

The criteria used to calculate economic difficulties are:

1. Condition Z-Score value > 2.60 means so as to Bank is not in economic difficulty.
2. Condition Z-Score value < 2.60 means so as to Bank is within economic difficulty.

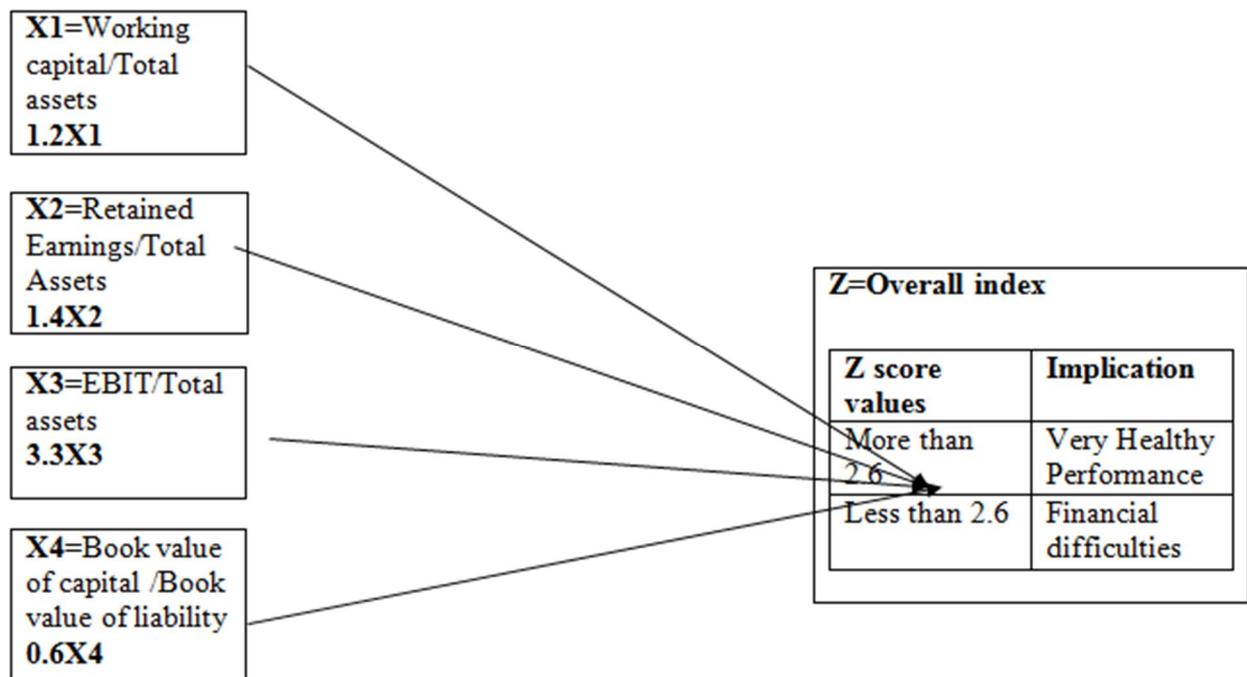


Figure 2 Conceptual Framework

Table 2 Summary of Z score Model

Name of the Banks	Z score values				
	2010	2011	2012	2013	Average value
National Bank of Pakistan (NBP)	0.4637	0.5866	0.6963	0.718	0.61464
Allied Bank Limited (ABL)	0.9792	1.0396	1.04387	1.2373	1.0750
United bank Limited (UBL)	1.427	1.52929	1.5382	1.4434	1.4844
Muslim Commercial Bank Limited (MCB)	1.1572	1.2649	1.2649	1.2136	1.197
Bank Al Falah limited (BAFL)	1.2697	1.3152	1.358	1.2838	1.3067
Habib Bank Limited (HBL)	1.359530	1.41511	1.77604	1.70588	1.56414

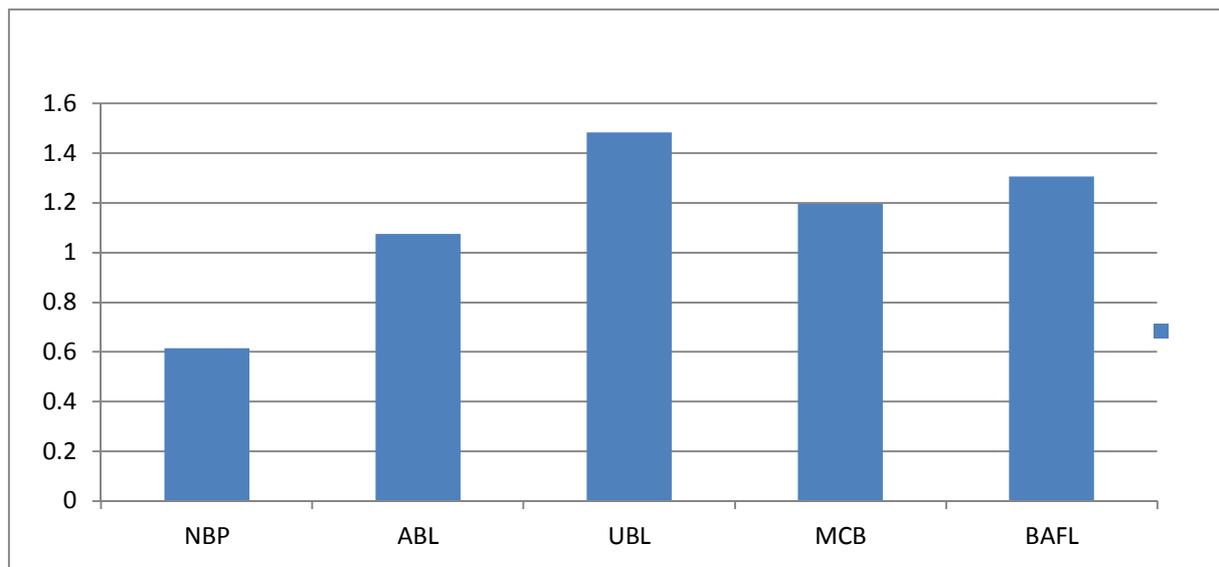


Figure 2

8. CONCLUSIONS

This study concluded that the National Bank Of Pakistan (NBP), Allied Bank Limited, United Bank Limited, Muslim Commercial Bank Limited, Bank Al Falah Limited, and Habib Bank Limited lie in

bankruptcy segment because all have Z score less than 2.6. But all commercial banks are operating their activities normally. So the Revised Altman Z Score model is not implacable in the financial institutions.

8.1. Comments

All the two models of Altman Z score are unable to predict financial soundness of the commercial banks in Pakistan. But in these three models, the Altman Z score revised model of 1995 is better than the remaining two models. When anyone wants to take decision, it is recommended so take decisions on multiple models like the report of State Bank of Pakistan and ratio analysis. But taking decision on only Z score models is inaccurate.

8.2. Future Recommendations

The Study makes suggestions to investors and researchers to apply Altman Z score Model on other sectors in Pakistan such as Cement Sectors, Oil and Gas Sectors, Chemicals Sectors, Engineering Sectors etc.

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