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Measuring Financial Permanency of Firms in Emergent Economy: A Comparative Study on Financial Institutions of Pakistan

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Abstract

Financial institutions play vital part in the development and advancement of the economy especially in emerging countries. Islamic products are very scorching contemporary issues although the Sharia based assets are having very low fraction in the global economy. The motive of this study is to calculate the financial longevity and soundness of financial institutions of Pakistan. For the said aim, this study used yearly data of Islamic banks, Modaraba firms and interest-based banks of Pakistan from 2013 to 2018 and measured the financial stability of the financial institution applying the Modified Altman Z-score model. Findings of the study asserted positive results with respect to financial soundness of all Islamic Banks and Interest-based banks as their Z-scores were demonstrated in stable zone over the period whereas most of the modaraba firms were also showing financial soundness during the period except two of them in inconclusive. This portray that all the financial institutions of Pakistan are dealing with their financial assets proficiently This study is helpful for the stakeholders of the institutions to decide strategically about their stake.

Keywords: *Financial longevity, Altman Z-score, Assets*

Introduction

Stability of the economy depends on the stability of industries working under the contemporary political economies. Financial institutions play very vital role in the expansion and progress of economy specifically in emerging nations (Iqbal & Mirakhor, 2011). Their vitality is being considered as back bone of the governance system in the country because they are the immediate source of financial cushion not only for the business industries but also for the government. Therefore, it is crucial to measure the financial stability of these institutions by predicting probability of nearness of the firm to financial distress.

The Previous works mentioned that the definition of financial instability have not been agreed (Platt & Platt, 2006). The nonappearance of a prescribed definition of financial distress sets into enquiries on the cogency of previous investigates that directed in this field. Diverse methods would sometime show stable firms as instable and its opposite, because of unavailability of a proper description of financial instability and it will be very tough to discourse this difficulty (Platt & Platt, 2006).

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Outecheva listed the financial instability into three categories, (1) event-oriented, (2) process-oriented, and (3) Technical. The first class of financial instability associated with the condition of the firm as “the inability of a firm to pay its financial obligations as they mature” Second class of financial instability is stated as sole state of a process which leads to failure or restructuring. It is basically a “midway between financial distresses is seen as an intermediate state between solvency and insolvency”. This explanation helps in accepting the financial instability as a miracle in making a wide range explanation of financial instability (Outecheva, 2007). The third category relates with the identification of distress indicators through reviewing the literature, appraising the financial conditions of the bankrupt firms.

The purpose of financial instability measure is to forecast the financial problems of the firm in advance. It has lots of names, like, liquidation failure forecast, business letdown, monetary bankruptcy, financial hazard, and defaulting as well. According to Anderson (2006) there are lots of grounds that guide us about financial instability, the major reasons are monetarist, financial, negligence, disaster and fraud facets. Accurately for casting the financial instability of the firms is a major issue in leading modern subjects like accounting, finance, statistics (Cybinski, 2001; Yu et al., 2014).

The forecast of financial instability enables the financial institutions to take a deep look on the firm

instability/stability while deciding the firm is suitable for credit, if yes, then how much the rate of return is to be charged, and in Murabaha and Islamic banks case where the banks buy a good and sell them at what premium rate (Beck, Demirgüç-Kunt, & Merrouche, 2010; Hillegeist 2004).

The chances of financial instability of financial institutions like banking institutions, companies dealing with insurance and other the government foundations can also use these results for considerations. Sustainable growth of banks from operations can also be useful for other stakeholders like mergers companies also use the forecast as a measure of failure or success (Gepp & Kumar, 2012).

During the global financial crisis 2007-2008, Islamic banking has grown positively. The growth of the assets of Islamic banks were growing 17.6% per year throughout the period of 2009 and 2012 and predicated that the assets of Islamic banks would likely to grow at virtually 20% per year until 2018 ("Big Interest, No Interest," 2014). Assets had touched US$1.9 trillion in 2014 and they were predicted to grow to US$2.6 trillion by 2017. The portion of Islamic banking in the global banking assets is under 2%. This ratio is quickly increasing mainly in 10 Islamic countries and covering the 15% of total banking assets including Iran and Sudan with fully Islamic Financial Economy Bangladesh, Kuwait, Brunei, Malaysia, Qatar, Saudi Arabia, The United Arab Emirates and Yemen. In Middle East Islamic banks holds 80% of market share and 20% in the rest of the world. Islamic banks are expanding their network in rest of the world as well and having presence in 50 countries (Hanif & Iqbal, 2011).

In the economy of any country, the deep-rooted Islamic banking organization play a vital role. A well-established economy is an essential part of a healthy society that is the ultimate purpose of the Islam (Iqbal & Mirakhor, 2011).

The overall Islamic cash exhibit is growing fairly, in perspective on the very strong premiums in the Halal areas, structure, and the sukuk protections, specifically by using the electronic mediums in all things and firms. The portion leading the advancement of market are managing adventure toward the huge improvement openings in the auspicious Islamic fragments. The Islamic record has expanded quickly over the prior decade, making at 10-12% reliably. Today, Sharia-charming budgetary resources are assessed at generally US$2 trillion, covering bank and non-bank cash related affiliations, capital markets, money markets, and insurance. ("Takaful") (Dublin, 2019).

In the world, there were 1.3 trillion resources of Islamic banks in 2012, with a developing pace of 15% every year. As per State Bank of Pakistan (SBP), currently five (5) undeniable Islamic banks that are completely offering Islamic services are working in Pakistan and a lot of stores in the financial business is almost 13% and is relied upon to develop to 20% by 2020 (Ullah, 2019).

The major benefit that Islamic banking gives to a country is the elimination of the usury (Riba). The elimination of usury indorses and straight the financial performance (Iqbal & Mirakhor, 2011). The fulfilment of social welfare and provision of benefits are the major objective of the Islamic financial processes. Both objectives can be achieved by promoting the Islamic values and social responsibility to the humanity (Amin et al., 2013).

With regards to Pakistan, there is a predetermined many of studies led on money related trouble forecast; in any case, these investigations are constrained to little example size, explicit mechanical segments, and factual systems. For example, Rashid & Abbas (2011) utilized various discriminant examination (MDA) on the information of 52 firms; Ijaz et al. (2013) concentrated uniquely on sugar area with an example size of 35 firms; Din & Aziz (2016) took just 48 firms of material segment; Wagan et al. (2016) utilized MDA on an example size of 38 firms and Jaffari & Ghafoor (2017) thought about MDA and logit examination utilizing an example of 70 firms. Ashraf et al. (2019) took the sample of 422 organizations listed on a Pakistan Stock Exchange from 2001 to 2015 and applied five financial distress predication models to patterned the level of financial soundness and accuracy of the distress forecast models.

In this study, it is aimed to investigate the financial permanency by measuring level of financial instability of Islamic Banks, Modaraba Companies and Interest Based Banks of Pakistan using Modified Altman Z-Score model.
Structure of the study fallows as: after the introduction section, literature review is discussed grasping previous studies related to the Z-score, modified Z-score and the financial distress predication of the organization, after that the methodology of the article is given. The results and discussion section are placed in the last section followed by conclusion.

Literature Review

A study conducted by Fitz Patrick, (1932) he founded that in the beginning of 1930s, the forecast of financial instability has been widely researched.

Further expansion in this topic was taken by Beaver (1966) and he developed a first innovative statistical tool named univariate model, this tool used the financial ratios to measure financial instability. One backdrop of the Beaver model was the ratios used in the model. Their results were mismatched with each other and this was differing the forecast which ceased to be a feasible tool (Gepp & Kumar, 2012). The first multivariate tool functional to financial instability forecast was the Beaver's model (Altman, 1968).

The forecast tool was very useful for financial organizations, rating agencies, asset manager and other people who were related to this field. Financial organizations play a vital role to fulfil the financing needs of any economy, and they are also interested in maximizing the gain on credit in order to minimizing the level of non-performing loans. Capital adequacy and the

internal rating tactics stimulated by the Basel Accords are most attractive for the bankers. Corporate person like an investor or a financial asset manager always search for a tool that is reliable for selecting the right organization for their portfolio (Altman, 1983).

Risk related to the organizations will be a chance of high return while planning for the shorter time period, but financial instability will be harmful for the investor returns. The tool that help to predict the firm's default ratio was the foremost demand of the rating agencies and the institutions that were in the way to issue the securities. The management of financial instability of the firm utilized the Z-Score model as a guide to financial improvement. Over the period of time various methods used to forecast the bankruptcy have been improved (Altman, 1983). Univariate study used selected ratios that have the ability to forecast. A multiple discriminant analysis (MDA) called Z- Score was introduced by (Altman, 1968).

Further expansion in the financial instability research was seen in subsequent two decades. For instance, a logit Model was introduced by Ohlson (1980), Z-score for the United Kingdom organizations proposed by Taffler (1984) and a probit method was used by (Zmijewski, 1984).

A research conducted by Dimitras, Zanakis, & Zopounidis (1996) investigated 47 models that were used to forecast. The most dominant model and ratios were the combination of the solvency and the profitability ratios of the organizations.

Another study conducted by Balcaen & Ooghe (2006) examined 43 models that were used for forecasting the failure of the business and they enlisted all the models in four different groups including Risk Index model, Univariate model, conditional probability model and MDA models. They excluded quickly growing models based on the contingent rights and the option pricing theory (Vassalou & Xing, 2004) KMV model (Kealhofer, M. & Vasicek, 2003) and the hazard models (Shumway, 2001).

One more research conducted by Kumar & Ravi (2007) inspected 128 statistical and artificial models used for the insolvency forecasting of the banks and other organizations. They also explored neural network as most famous intelligence method.

An investigation conducted by Jackson & Wood (2013) surveyed the past investigations and got frequency of occurrence of specific forecasting strategies. In their discoveries, five most noticeable strategies were utilized which were 1st Multiple discrimination analysis, 2nd Logit model, 3rd Neural network, 4th Contingent Claims, and 5th Univariate analysis.

Agarwal & Taffler (2008); Das, Hanouna, & Sarin (2009) and Bauer & Agarwal (2014) was reviewed the efficiency of these models. In their investigation, they took three types of models including the model consist on accounting-principles, model work on Market grounds, and the founded by Hazard. Previous studies showed that these models were successful in the past. The forecasting accuracy of model used accounting principles and model based on market laws was little different, but using accounting-principle model enabled us for grater stage of distress accustomed profits on credit activities (Agarwal & Taffler, 2008).

The distress forecasting model based on accounting principle performed comparably to other model that predict distress i.e. Merton structural and the market grounded method used for credit default spread forecast (Das et al., 2009). Yet a wide rage method was necessarily needed that used all possible variables like variables related to market and variable related to information based on accounting data, will perform much batter then other available models.

According to Bauer & Agarwal (2014) the method introduced by hazard used accounting related variables and market grounded information as well. two other famous approaches were compared by Campbell et al. (2008) and Shumway (2001), the Z-score model originally developed by Altman , Taffler (1984) tested that method later and a contingent claims model was verified by (Bharath & Shumway, 2008; Agarwal & Taffler (2008)).

The forecasting of financial soundness of the firms is a wide range subject and lots of methods was developed in the past, a model founded by hazard were very accurate to predict the financial condition of the organization named as ROC (Receiver Operating Characteristic) an analysis, yet the method introduced by Altman forty five years ago is much famous then any other available model either in the filed of research or in the practical filed as well world widely as a major shareholder of the financial soundness prediction (Altman, 1983; Bauer & Agarwal, 2014; Mohammed, 2016).

Model Related Discussion

Altman (1968) made out of 66 firms, with 33 firms in every one of two sets. The bankrupt set (Group 1) comprised of producers (manufacturers) that sought financial protection petitions under Chapter X of the National Bankruptcy Act during the 1946–1965 era.

Utilizing budget summaries, Altman incorporated a rundown of 22 possibly significant monetary proportions for assessment. Altman arranged these indicators into five categories proportion arrangements: liquidity, profitability, leverage, dissolvability, and activity. This piece of research plants the significance of the proportions and the conceivable connection to the examination.

The function of the discrimination estimated was as below:

$$Z = 1.2 * \mathrm{X1} + 1.4 * X2 + 3.3 * X3 + 0.6 * X4 + 1 * X5 \quad (1)$$

where X_1 = Working Capital/Total Assets with the weight of 1.2; X_2= Retained Earnings/ Total Assets with the weight of 1.4; X_3 = Earnings before Interest and Taxes/Total Assets with the weight of 3.3; X_4 = Market Value of Equity/Book Value of Total Liabilities with the weight of 0.6; X_5 = Sales/Total Assets with the weight of 1; Z = Overall Index.

Initially the original version of Z-Score model was grounded on the market value of the firm and appropriate for the public firms only. Altman (1983) highlight that the Z-score for public firms and the adjustment were not appropriately suitable. Altman (1983) introduced a totally new model replacing the book value of equity with the market value in X_4. Altman used the same data and weight, and reviewed the Z-Score model as:

$$Z = 1.2 * (X1) + 1.4 * (X2) + 3.3 * (X3) + 0.6 * (X4) + 1 * (X5) \quad (2)$$

However, X_4= Book value of equity/Book value of total liabilities, rest of all variables are same as in the initial Z-score model.

Altman (1983) analyzed the accuracy of a four-variable Z"-Score model that excluded the Sales/ Total assets ratio, X5, from the revised model because of a potential industry effect that is more likely to take place when this kind of industry-sensitive variable (asset turnover) was included in the model (Altman, 1983). The EBIT/Total Assets ratio, X3, contributed most to the discrimination power in this version of the model. The restructured Z-Score model was consisting of 5 variables and its results distribution was undistinguishable. The use of other estimation technique or the use of specified countries data were the most common alternation to the Z-score model.

Multi-discriminant Model of Study

The following alteration of the Z-Score model investigated the qualities and precision of a model without X5 – Sales/Total assets. We do this so as to limit the potential business impact that is bound to happen when such an industry relevant variable as Assets Turnover is incorporated. What's more, we have utilized this model to survey the financial strongness of non-U.S. corporates. Specifically, Altman, Hartzell and Peck (1995, 1997) have applied this upgraded Z" Score model to developing markets corporates, explicitly Mexican firms that had given Eurobonds named in US dollars. The arrangement estimation of identical was utilized for X4 for this situation. The order results are indistinguishable from the amended five-variable model (Z-Score).

The new Z"-Score model is:

$$Z'' = 6.56 * (X1) + 3.26 * (X2) + 6.72 * (X3) + 1.05 * (X4) \quad (3)$$

Where Z"-Scores below 1.10 indicate a distressed condition. All of the coefficients for variables X1 to X4 are changed as are the group means and cut-off scores (Edward I Altman, 2002; Edward I. Altman et al., 2017; Chenchehene, 2019).

Using the combination of Altman's ratios and MDA enhance the prediction ability of the Z-Score model. The US and the non-US firms, the implication of improved model on it also improved the Z-score model working as well.

Kwak, Shi, Cheh, & Lee (2005) investigated the bankrupt US organizations from 1992 to 1998 and test them using Multiple Criteria Linear Programing (MCLP) to model 5 Altman and Olhsan model variables and it related six-time U.S.A. control firms. The performance of MCLP method was better than Altman (1968) model and gave comparable findings to or more appropriate than the original Ohlsons model. The author suggested only their original prediction rates because the original models were not re-tested. Merkevicius, Garšva, & Girdzijauskas (2006) designed a hybrid artificial discrimination model including MDA and an unverified learning artificial neural network and applied on the United States and the Lithuanian Organization. The predication accuracy rate of the hybrid SOM-Altman model was 92.35%.

Xu & Zhang (2009) investigated and applied the Altman Z-Score, Ohlson O-Score and D-Score model on the Japanese firms to verify the accuracy of these models. They also introduced a new model C-score merging the all other model. After that they introduced some unique variable related to Japan to test that whether corporate structure have any impact on the chance of bankruptcy and named it as X-Score. These models were just useful for predicating the bankruptcy of Japanese organization on other hand the market grounded model was the best suitable. Coming up with final remarks the C-score and the X-score are the country specified variables improve the bankruptcy forecast.

Tinoco & Wilson (2013) conducted a study and the purpose of the study was to develop a new model for U.K listed companies including the accounting, market and the macroeconomic data and they set the Altman Z-score as a benchmark to check the performance of the model. In the financially upset organizations, there were 81% versus 87% for new model. However, it was also suitable for the non-upset organizations forecast. Lyandres & Zhdanov (2013) introduced another modification that

modelled of whether the addition of the investment related variables can improve the strength of above three model. The proxies that they use to measure the investment chances (market to book, book value and R&D to Assets).

Chava & Jarrow (2004) investigated the U. S. A. listed firm's bankruptcy database to check advantage of Shumway (2001) model over Altman (1968) and Zmijewski (1984) models. The writer re-estimated the models over the 1962-1990-time period and predict bankruptcies over the period of 1991-1999. The accuracy of the models in this case the Shumway model were 74.4% in the first ten-year period, the bankruptcies were correctly identified, and the Altman model were 63.2% and the Zmijewski model with 43.2%.

Reisz & Perlich (2007) introduced a new model including fence options bankruptcy forecast and compare biased strength with the other market grounded model and Altman Z-Score and Z-Score. They selected the dataset of nearly 6000 industrial organizations over the period of 1988-2002.

The authors recorded the uniqueness of Altman Z-Score and Z-Score model for short-term insolvency forecast, their fence choice model outdone the other model, for medium and long term insolvency forecast. Wu, Gaunt, & Gray (2010) used the latest data of U. S. A. listed organization to assessed the performance of five model (Altman, 1968; Hillegeist et al., 2004; Ohlson, 1980; Shumway, 2001; Zmijewski, 1984).

The scholar introduced another multi-period logit model taking as benchmark the above discussed model with an increase of the set of variables. This model included the market data as well as the organization qualities, outdone the other model. The performance of Shumway's model was better than Altman Z score, Hillegeist et al.'s model performed sufficiently and the Ohlson's and Zmijewski model performed worsened. Although their performance worsened over time.

Jackson & Wood (2013) investigated the 13 different model of insolvency forecast and evaluated the efficacy using ROC curve. They used different set of variables including three single variable models, four contingent claims models, three accounting grounded models including Altman Z-score in two Versions and the latter group outdone the other models. European call and barrier chances were the ground for the four best models that were the contingent claims models.

Research Methodology

This study is a quantitative in nature based on secondary data. For the said purpose the data was collected for the period of 2013 to 2018 for all Islamic Banks, Modaraba Companies and Interest Based Banks of Pakistan. There are currently five Islamic banks which purely provide the services of Islamic financial products, twenty Modaraba Firms and eighteen Interest Based Banks included in analysis, sourcing data from the annual reports downloaded from the official web sites of the concern bank and modaraba firm, State Bank of Pakistan (SBP), Security and Exchange Commission of Pakistan (SECP) and Pakistan Stock Exchange (PSX).

On the basis of the data and the model (3) discussed in previous section, modified Z-score was measured for each firm over the period to highlight the financial stability of the firm whether it was near to success or failure. Results and discussion of the model are given in upcoming section.

Firm Strongness Criteria Based upon Modified Z-score

Table 1: Z-Score Prediction Criteria

Z-Score:	Prediction:
$Z > 2.6$	Stable
$Z \leq 1.10$	Un-stable
$1.10 \leq Z \geq 2.6$	Inconclusive

Source: (Altman, 2002;Chenchehene, 2019)

As per table 1, If the Z-score of firm is greater than 2.6, it means that the firm is financially strong and have the ability to survive in very efficient manner; On the other hand, if the Z-score of a firm is less than 1.10, it assert that the firm is financially instable and suffering from financial distress which may lead to bankruptcy; if the Z-score of a firm is between the mentioned score, it indicates that the firm is in indifferent and inconclusive stage which may lead to either side.

Data Analysis and Discussion

Summary statistics of modaraba companies and Islamic banks of Pakistan are given in table 2 and table 3 and 4, respectively. Overall average Z-score of the modaraba companies of Pakistan is 7.47 which sounds financially stable firms in the whole sector and asserts that firms are currently away from the financial distress. Deviation value of overall Z score is higher than the mean value which indicates to get the care of the sector immediately otherwise it may deviate towards the negative side. Liquidity of the modaraba companies in terms of Working Capital to Total Assets (WCTA) is also maintained at good level with less deviation. Retained Earnings to Total Assets (RETA) and Earnings Before Interest and Tax to Total Assets (EBITTA) are at low level and some of their values are also ranged in negative zone which depict that profitability of the sector is positive but may become shattered afterwards. Comparison of Book value of Equity to Book value of Total Liability of the firms in the sector (BETL) demonstrate that firms have much greater value in equity as compared to liability. Investor have confidence in the consideration of investment in these companies.

Table 2: Descriptive Statistics of Modaraba Firms of Pakistan

Variables	Count	Mean	Std. Error	Median	Std. Dev.	Range	Min.	Max.
Z-Score	120	10.70	1.0588	7.4720	11.5983	79.2662	0.6673	79.9335
WCTA	120	0.53	0.0221	0.4675	0.2421	0.9105	0.0890	0.9995
RETA	120	0.14	0.0673	0.0838	0.7373	4.7369	-1.6234	3.1136
EBITTA	120	0.05	0.0064	0.0440	0.0699	0.6332	-0.2774	0.3558
BETL	120	6.14	0.8169	2.7205	8.9489	60.5390	0.0202	60.5592

Source: Author's calculation

Z-score = Modified Altamn Z-Score, WCTA = Working Capital / Total Asset, RETA = Retained Earnings / Total Asset, EBITTA = Earnings before Interest and Tax / Total Asset, BETL = Book Valve of Equity / Total Liabilities

Table 3: Descriptive Statistics of Islamic Banks of Pakistan

Variables	Count	Mean	Std. Error	Median	Std. Dev.	Range	Min.	Max.
Z-Score	28	6.79	0.02	6.79	0.12	0.43	6.56	6.99
WCTA	28	0.98	0.00	0.98	0.01	0.07	0.93	0.99
RETA	28	0.01	0.00	0.01	0.01	0.05	-0.01	0.04
EBITTA	28	0.04	0.00	0.04	0.01	0.04	0.01	0.05
BETL	28	0.12	0.03	0.07	0.13	0.55	0.04	0.59

Source: Author's calculation

Z-score = Modified Altamn Z-Score, WCTA = Working Capital / Total Asset, RETA = Retained Earnings / Total Asset, EBITTA = Earnings before Interest and Tax / Total Asset, BETL = Book Valve of Equity / Total Liabilities

Table 4: Descriptive Statistics of Interest Based Banks of Pakistan

Variables	Count	Mean	Std. Error	Median	Std. Dev.	Range	Min.	Max.
Z-Score	108	7.1440	0.1346	6.8464	1.3983	10.5172	6.2123	16.7295
WCTA	108	0.9774	0.0011	0.9793	0.0110	0.0493	0.9454	0.9947
RETA	108	0.1200	0.0398	0.0266	0.4135	2.9941	-0.0251	2.9690
EBITTA	108	0.0381	0.0011	0.0380	0.0115	0.0690	-0.0002	0.0688
BETL	108	0.0807	0.0041	0.0727	0.0430	0.3137	0.0266	0.3402

Source: Author's calculation

Z-score = Modified Altamn Z-Score, WCTA = Working Capital / Total Asset, RETA = Retained Earnings / Total Asset, EBITTA = Earnings before Interest and Tax / Total Asset, BETL = Book Valve of Equity / Total Liabilities

Table 5: Correlation Analysis of Modaraba Firms of Pakistan

Variables	Z-Score	WCTA	RETA	EBITTA	BETL
Z-Score	1				
WCTA	0.4543	1			
RETA	0.7156	0.2426	1		
EBITTA	0.0393	0.2290	0.0530	1	
BETL	0.9725	0.3183	0.5838	-0.0538	1

Source: Author's calculation

Z-score = Modified Altamn Z-Score, WCTA = Working Capital / Total Asset, RETA = Retained Earnings / Total Asset, EBITTA = Earnings before Interest and Tax / Total Asset, BETL = Book Valve of Equity / Total Liabilities

Table 6: Correlation Analysis of Islamic Banks of Pakistan

Variables	Z-Score	WCTA	RETA	EBITTA	BETL
Z Score	1				
WCTA	0.1977	1			
RETA	0.5598	0.4356	1		
EBITTA	0.4974	0.2693	0.4345	1	
BETL	0.3431	-0.7433	-0.2843	-0.3072	1

Source: Author's calculation

Z-score = Modified Altamn Z-Score, WCTA = Working Capital / Total Asset, RETA = Retained Earnings / Total Asset, EBITTA = Earnings before Interest and Tax / Total Asset, BETL = Book Valve of Equity / Total Liabilities

Table 7: Correlation Analysis of Interest Based Banks of Pakistan

Variables	Z-Score	WCTA	RETA	EBITTA	BVETL
Z Score	1				
WCTA	0.2068	1			
RETA	0.9961	0.1556	1		
EBITTA	0.0553	0.0399	-0.0170	1	
BETL	0.8095	0.0875	0.7762	0.4437	1

Source: Author's calculation

Zscore = Modified Altamn Z-Score, WCTA = Working Capital / Total Asset, RETA = Retained Earnings / Total Asset, EBITTA = Earnings before Interest and Tax / Total Asset, BETL = Book Valve of Equity / Total Liabilities

Table 8: Z-Score of Modaraba Firms of Pakistan

Z-Score of Modaraba Firms of Pakistan								
Sr. No	**Modaraba Firms of Pakistan**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Avg. Score**
1	**Allied Rental Modaraba**	3.61	3.85	4.10	3.87	4.08	4.41	3.99
2	**B. F. Modaraba**	39.84	79.93	64.64	52.05	47.10	35.44	53.16
3	**BRR Guardian Modaraba**	3.70	3.19	3.98	4.03	5.77	6.08	4.46
4	**First IBL Modaraba**	9.23	16.63	12.04	9.18	30.41	9.38	14.48
5	**First Al - Noor Modaraba**	14.43	13.39	9.64	6.88	7.81	7.56	9.95
6	**First Elite Capital Modaraba**	5.28	6.09	6.36	6.48	5.15	4.42	5.63
7	**First Equity Modaraba**	22.62	20.72	15.55	20.38	11.06	17.06	17.90
8	**First Fidelity Leasing Modaraba**	14.53	15.68	15.90	15.60	14.92	11.17	14.63
9	**First Habib Modaraba**	6.12	28.44	4.70	4.57	4.55	4.24	8.77
10	**First Imrooz Modaraba**	8.84	8.81	9.46	9.74	9.44	9.46	9.29
11	**First National Bank Modaraba**	3.42	2.86	1.63	1.45	0.67	1.41	1.91
12	**First Punjab Modaraba**	3.92	5.02	5.70	4.30	4.47	4.59	4.67
13	**First Pak Modaraba**	18.63	8.27	11.62	8.38	8.07	4.38	9.89
14	**First Prudential Modaraba**	12.12	12.11	13.31	13.38	11.90	9.16	12.00
15	**First Paramount Modaraba**	6.65	5.74	5.80	6.63	6.53	7.99	6.56
16	**First Treet Manufacturing Modaraba**	17.96	18.11	10.11	8.74	2.98	2.54	10.07
17	**First UDL Modaraba**	4.13	5.00	6.54	5.93	8.41	8.89	6.48
18	**KASB Modaraba**	5.60	5.86	5.64	5.46	7.50	4.69	5.79
19	**Modaraba Al – Mali**	5.60	5.06	5.02	4.10	7.34	10.30	6.24
20	**Trust Modaraba**	5.94	8.64	7.45	8.05	9.11	9.59	8.13
Average Z Score of Modaraba Firms		10.61	13.67	10.96	9.96	10.36	8.64	10.70
No. of Firms in Success Zone		20.00	20.00	19.00	19.00	19.00	18.00	19.00
No. of Firms in Failure Zone		0.00	0.00	0.00	0.00	1.00	0.00	0.00
No. of Firms in Inconclusive Zone		0.00	0.00	1.00	1.00	0.00	2.00	1.00
Source: Author's calculation								

Descriptive summary of statistics of the Islamic banks of Pakistan is given in table 3. Z-score of the overall Islamic banks is in safe/success zone and indicate that banks are financially strong. Liquidity, profitability, leverage, solvency and activity ratio given in the table 3 of Islamic banks are indicating attractive and stable form of performance which may lead towards further financial stability.

Descriptive statistics of the interest-based banks given in table 4 shows that they are in very strong financial position, this indicates that the interest-based banks are dealing with their operation very efficiently because none of the banks is financially weak or distraction zone of Z-score criteria. Table 4 portray very strong performance which may lead towards more financial strongness.

Correlation of the variables of Z-score model are measured and given in table 5 for modaraba companies, table 6 for Islamic banks and table 7 for interest-based banks of Pakistan. It can be seen from table 5 WCTA, RETA, BETL and EBITTA have positive relation with measuring the overall Z-score and with each other as well except EBITTA has minor negative relation with BETL. Extent of positivity is greater than negativity. Therefore, it can be said that end effect would be positive.

As per table 6, Zscore has positive relation with all the variables in the model and all the variables have positive relation with each other excluding BETL. There is slightly negative relational ship between BETL and the EBITA.

It can be emphasized that Islamic Banks are not managing their equity and liabilities' activities efficiently and optimally. We may conclude that the overall its positive trend in the table.

According to table 7, Z-score has positive connection with all the variables used in the model, but RETA has negative relation with EBITTA. The rest of the pointer in the model have positive relation with each other. It tends to be stated that Interest Based Banks are dealing with their monetary assets very proficiently.

Based upon the Modified Altman Z-Score model discussed in literature review section and data collected for the mentioned variables, Z-score for each Islamic bank, modaraba firms and interest-based banks of Pakistan was calculated to demonstrate the financial stability level for each firm.

Table 8 is showing the Z-score of the 20 Modaraba Companies of Pakistan for the period from 2013 to 2018.

Comparing the score over the period, the table portray that almost all the firms have qualified for the success zone criteria of Z-score (i.e. 2.6) excluding one out of twenty. That firm stayed in the inconclusive zone that is midway between the success and distress in continuously for 3 years (i.e. 2014, 2015 & 2016) and then become financially bankrupt in 2017 but able to move in the inconclusive zone in 2018. In year 2018 two firms stayed in the inconclusive zone out of twenty and all the other firms remains in the success zone. That indicates that the overall performance of the modaraba firms is very satisfactory. Average score of each company demonstrates the same assertion that approximately ninety five percent firms are financially well-off and solvent.

Figure 1 is showing that the average Z-score of the modaraba companies over the period of 2013 to 2018.

As the graph is depicting the small up and down in the average Z-score, Average score in each year is highly greater than benchmark success score which depict the financial soundness of the sector. Modaraba firms were financially strong in 2014 as compared to other periods. Afterwards, there is a decline in financial stability of the firms over the period.

Table 9 contains the Z-score of the Islamic bank during the period of 2013 to 2018. In Pakistan there are five full fledge Islamic Banks. It is very good to see that there is no single bank which has Z-score less than 2.6 and comes in distress zone. All the Islamic banks are in success zone and as per findings of the Modified Altman Z-Score model, every bank managing their resources in an efficient manner. There is slight decline in the average Z-score value of the bank in the recent years.

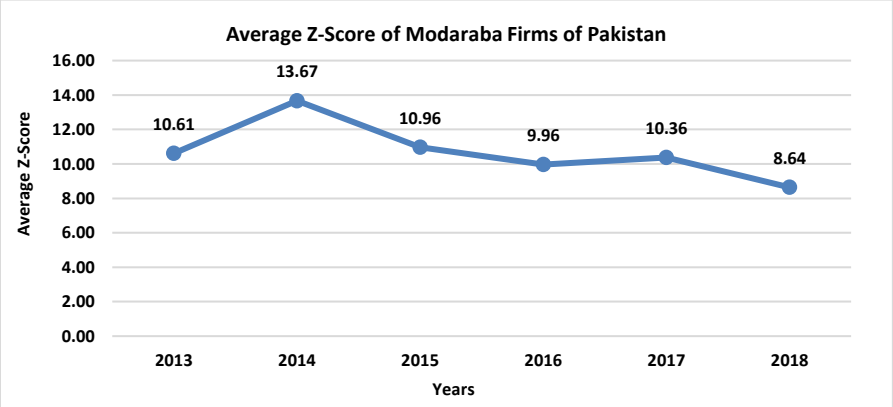

Figure 1: Average Z-Score of Modaraba Firms of Pakistan

Table 9: Z-Score of Islamic Banks of Pakistan

Z-Score of Islamic Banks of Pakistan								
Sr.No.	Islamic Banks of Pakistan	2013	2014	2015	2016	2017	2018	Average Z-Score
1	Meezan Bank LTD	6.85	6.87	6.89	6.87	6.87	6.89	6.87
2	MCB Islamic LTD	N/A	N/A	6.96	6.99	6.65	6.56	6.79
3	Dubai Islamic Bank Pak LTD	6.83	6.88	6.81	6.91	6.97	6.93	6.89
4	BankIslami Pakistan LTD	6.65	6.71	6.75	6.71	6.68	6.69	6.70
5	Al-Baraka Bank (Pak) LTD	6.60	6.65	6.71	6.72	6.78	6.77	6.70
Average Z Score		6.73	6.78	6.82	6.84	6.79	6.77	6.79
No. of Firms in Success Zone		4.00	4.00	5.00	5.00	5.00	5.00	5.00
No. of Firms in Failure Zone		0.00	0.00	0.00	0.00	0.00	0.00	0.00
No. of Firms in Inconclusive Zone		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Source: Author's calculation								

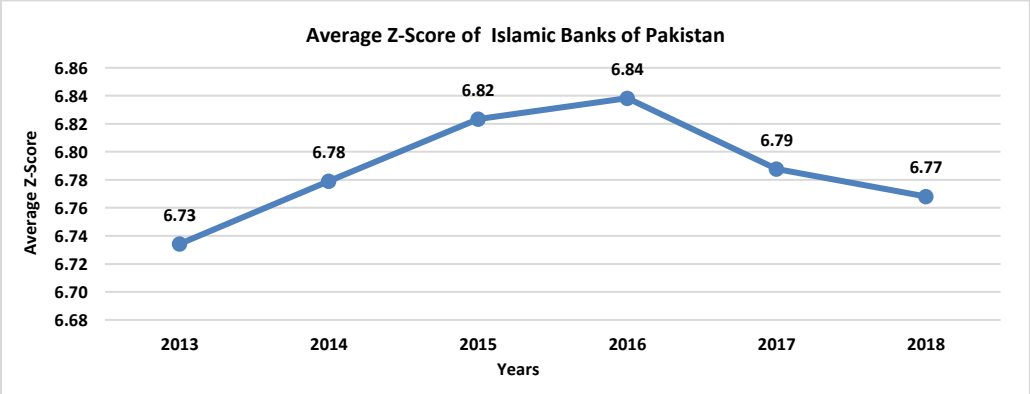

Figure: 2 Average Z-Score of Islamic Banks of Pakistan

Figure 2 shows the Z-score of all Islamic banks of Pakistan during the period of 2013-18. The average Z-score of all Islamic banks is showing mix trend. The average is in increasing trend from 2013 till 2016, but after that period there is a sudden decline till 2018. The good thing is this the average Z-score value is also in the success zone during the time frame.

Table 10: Z-Score of Interest Based Banks of Pakistan

Z-Score of Interest Based Banks of Pakistan								
Sr. No	**Interest Based Banks of Pakistan**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Avg. Score**
1	**Allied Bank Limited**	6.79	6.86	6.78	6.90	6.79	6.83	6.82
2	**Askari Bank Limited**	6.44	6.73	6.77	6.78	6.81	6.79	6.71
3	**Bank Alfalah Limited**	6.74	6.79	6.81	6.85	6.89	6.94	6.82
4	**Bank AL Habib Limited**	6.74	6.78	6.84	6.84	6.82	6.72	6.80
5	**The Bank of Khyber**	7.11	7.11	7.09	7.02	6.96	6.94	7.06
6	**The Bank of Punjab**	6.71	6.72	6.80	6.81	6.64	6.86	6.73
7	**Faysal Bank Limited**	6.70	6.74	6.80	6.83	6.86	6.89	6.79
8	**Habib Bank Limited**	6.91	7.00	7.04	7.02	6.87	6.88	6.97
9	**Habib Metropolitan Bank Ltd**	6.89	6.92	6.99	6.99	6.94	6.97	6.95
10	**JS Bank Limited**	6.70	6.73	6.79	6.80	6.70	6.67	6.74
11	**MCB Bank Limited**	6.99	7.05	7.14	7.14	7.06	7.09	7.08
12	**National Bank of Pakistan**	6.72	6.83	6.89	6.91	6.88	6.85	6.84
13	**Soneri Bank Limited**	6.77	6.78	6.82	6.81	6.77	6.77	6.79
14	**United Bank Limited**	6.92	6.96	6.99	7.01	6.91	6.94	6.96
15	**Samba Bank Limited**	16.73	14.69	11.72	10.12	10.15	10.04	12.68
16	**Standard Chartered Bank (Pakistan) Ltd.**	7.13	7.24	7.25	7.28	7.22	7.29	7.22
17	**Silk Bank Limited**	6.47	6.64	6.61	6.72	6.80	6.85	6.65
18	**Summit Bank Limited**	6.21	6.50	6.47	6.36	6.34	6.33	6.38
Average Z Score of Interest Based Banks		7.31	7.28	7.14	7.07	7.02	7.04	7.17
No. of Firms in Success Zone		18	18	18	18	18	18	18
No. of Firms in Failure Zone		0	0	0	0	0	0	0
No. of Firms in Inconclusive Zone		0	0	0	0	0	0	0
Source: Author's calculation								

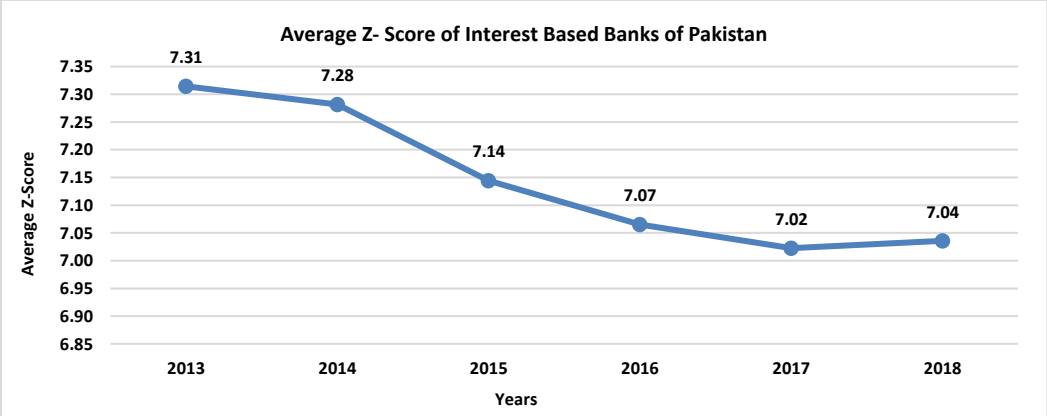

Figure: 3 Average Z-Score of Interest Based Banks of Pakistan

Table 10 describes the Z-score results of Interest Based Banks of Pakistan. Looking at the score over the period, all of the bank has qualified for the success zone criteria of the Modified Altman Z-score that is (i.e. 2.6). The average Z-score of the sector also indicate the similar picture, that means that the interest-based banks are dealing with their operations very diligently and they are faraway for the distress.

Figure 3 is appearing with average Z-score of the Interest Based Banks over the time of 2013 to 2018. As the chart is appearing extensive here and there in the normal Z-score, Average score in every year is in decreasing trend. The figure sows the slight decline in every year, but the average Z-score value in each year is faraway grater then the Z-score success zone criteria. At the end of the under-observation period the graph started increase that indicates a sign of growth for the interest-based bank of Pakistan.

Findings of the Study

Findings of the study with respect to modaraba companies were not very much alarming because only one firm is in distress and one is in inconclusive zone out of twenty firms. Findings related to Islamic Banks of Pakistan and interest-based Banks of Pakistan are very satisfactory because all the Islamic banks and the Interest based banks are in success zone that portray that specifically the banking sector is in very healthy condition and the management of the banking sector is working very proficiently.

Conclusion

Financial institutions are considered backbone of the economy because they perform very enliven contribution in the development and growth of the economy

especially in the emerging countries. In the light of the results the selected sample of financial institutions of the Pakistan (i.e. Modarabra firms, Islamic Banks and Interest Based Banks) is performing very well. Therefore, it is concluded that the financial institutions of Pakistan are in very strong position and dealing with their financial operation very efficiently and this is a positive indicator for the economic growth of Pakistan.

Recommendations of the Study

Pakistan is an emerging economy which faced lot of positive and negative growth periods since inception. Being an Islamic Republic country and 6th largest populated estate in the world, there is dying need and ultimate duty of the Central Bank and Security and Exchange Commission of Pakistan (SECP) to restructure these Islamic institutes especially the Islamic banks by creating the awareness among people to gain confidence, establishing academic institutes and introducing competitive but distinguished Islamic products at level of society so that full fledge Islamic banks could be increased as being happened in the world. On the basis of given results, it is recommended for decision makers especially investors and finance providers to make the investment and financial decisions using some additional measures of financial stability along with Modified Altman Zscore model.

Limitations of the Study

The study can be made more comprehensive by applying more financial distress measures to re-examine the level of financial soundness and comparative analysis.

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