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Bankruptcy Profile of the Islamic Banking Industry: Evidence from Pakistan

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Abstract

The purpose of this study is to examine the bankruptcy profile of the Islamic banking industry in Pakistan for the post-crisis period 2007-2008. This study used Altman's Z-score bankruptcy evaluation model for evaluating bankruptcy rates of the sampled Islamic banks from Pakistan for the post-crisis period 2009-2015. ANOVA result shows the P-value with 0.002, which implies that the sampled Islamic banks from Pakistan do differ in their rates of bankruptcy. Regression results show that the variables liquidity and productivity ratios have a significant positive impact on the bankruptcy profile of the Islamic banking sector in Pakistan. While profitability and insolvency, ratios indicated an insignificant impact on the bankruptcy profile of the Islamic banking industry in Pakistan. The overall analysis of this study is viable to draw the attention of researchers and practitioners towards the deteriorating bankruptcy

profile of the Islamic banking sector in Pakistan. The study also persuades the researchers to design a separate Shariah-based bankruptcy evaluation model for the Islamic banking industry of Pakistan.

Keywords: Islamic banking, Bankruptcy, Sustainability, Financial crises

1. Introduction

In the current era, the banking industry is considered as a backbone for the financial stability of economies. This is because of its central financial role in the economies, which enables it to achieve the developmental milestones of the country (Brown, 2003; Hanif, Tariq, Tahir, & Momeneen, 2012; Jeucken & Bouma, 1999; Olson & Zoubi, 2011; Safiullah, 2010). In the current global financial system, the banking industry holds a significant share, and due to this significant share, the banking industry becomes more responsible for the collapse of economies. The threat of the toppling of economies due to the working process of banking industries is much higher where the banking industry holds a higher share in the overall financial system of the country (Swamy, 2014).

The development of any country's economy is dependent upon the good performance of its financial system. On the other hand, the inefficient performance of the banking industry can deteriorate the economic progress domestically and even internationally as well. The importance of the banking industry internationally can be a witness from the financial crisis of 2007-2008, When the collapse of the world giants banks like the Lehman brother's investment banking, Citi group new York, and the Anglo Irish bank totally unbalanced the world financial flow (Sharma, 2013). According to Chapra (2009), more than 100 financial crises have been seen by the world in the last 40 years.

For instance, in the (2007-2008) financial crisis, the financial performance of major Islamic banks like Kuwait Finance House of Kuwait, Noor Islamic Bank of Dubai, al-Hilal Bank of Abu Dhabi, Dubai Islamic Bank, and Al-Rajhi Bank of Saudi Arabia were strongly affected (Husna et al., 2012). Similarly, Yudistra (2004) pointed out that the financial crisis of (1998-1999) had also affected the financial performance of Islamic banks. Some theoretical studies like that of (Derbel, Bouraoui, & Dammak, 2011) pointed out that Islamic banking can fractionally reduce the effect of a financial crisis. However, their claim was rejected by the studies like (Magd & McCoy, 2014) which illuminated that, Islamic banking show not totally immune to the world economic downturn, as the Islamic banking sector lost badly in real estate business and Sukuk business. However, the experience of the above problems concerned with Islamic banking and an accounting concept known as going concern concept have cautioned all the interested and associated parties related to Islamic banking to evaluate their sustainability and bankruptcy evaluations. As in the views of (Mossman, Bell, Swartz, & Turtle, 1998), the going concern concept is absolutely necessary for the internal and as well as for external stakeholders of the firm.

In the context of problems associated with Islamic banking, the studies relating to bankruptcy and sustainability in the Islamic banking sector are limited in the literature (Jan & Marimuthu,

2015a, 2015b, 2015c, 2016, 2019; Jan, Marimuthu, bin Mohd, Isa, & Shad, 2019; Jan, Marimuthu, Pisol, Isa, & Albinsson, 2018; Jan, Marimuthu, Shad, et al., 2019). Therefore, this pioneering study used the Key Performance Indicators (KPIs) for evaluating bankruptcy in the Islamic banking industry of Pakistan. In the bankruptcy predicting techniques which are artificial intelligence techniques and statistical techniques, the ratio analysis technique is the efficient one predictor for the bankruptcy of the firms (Altman, 1968; Chieng, 2013; Mossman et al., 1998; Pompe & Bilderbeek, 2005). This is because bankruptcy evaluation warns the representative and concerned authorities and provides information about the firm's position to take some urgent steps for the purpose to avoid bankruptcy (Altman, 1984; Telmoudi, El Ghourabi, & Limam, 2011). In-line with the literature studied it is highlighted that the performance of Pakistan's Islamic banking sector has been studied from different angles. However, the studies regarding bankruptcy forecasting of the Islamic banking industry have been widely over-sighted. And hence, by filling the above-identified gap in the literature, there is an option for this study to evaluate the bankruptcy profile of the Islamic banking sector of Pakistan.

The performance of the Islamic banking sector has been studied from different angles such as the profitability determinants of Islamic banks (Hassan & Bashir, 2003), liquidity risk management in the Islamic banking industry (Ismal, 2010), insolvency risk management in the Islamic banking sector (Čihák & Hesse, 2010), productivity and efficiency of Islamic banking (El Moussawi & Obeid, 2011), technical efficiency of Islamic banking (Sufian, 2007). Foreign Islamic vs. domestic Islamic bank's performance (Muda, Shaharuddin, & Embaya, 2013). Islamic banks vs. conventional bank's performance (Qureshi & Shaikh, 2012), the role of Islamic banks in the financial crisis (Said, 2013) and Islamic vs. Islamic bank performance (Saleh & Zeitun, 2006). However, all the previous studies of the Islamic banking industry were concerned with the ongoing performance of Islamic banking. But the studies relating to future forecastings such as bankruptcy and sustainability are found limited in the Islamic banking literature. Against this background, the following objectives are set.

1.1 Objectives of the Study

The research objectives of the study are as follows.

1. To analyze the bankruptcy rate of Pakistani Islamic banks.
2. To evaluate the impact of individual performance indicators on the bankruptcy profile of the Pakistani Islamic banks.

2. Literature Review

The performance of Islamic banking industry is been studied in different perspectives such as foreign Islamic vs. domestic Islamic banking (Muda et al., 2013), Islamic banking vs. conventional banking sectors performance (Qureshi & Shaikh, 2012), profitability analysis of Islamic banking sector (Hassan & Bashir, 2003), Islamic banks vs. Islamic banks performance comparison (Husain, Abdullah, & Shaari, 2012), Islamic banks performance in

the financial crisis (Said, 2013), but the study regarding bankruptcy and sustainability in the literature is found limited. Below are some studies conducted on the Islamic banking system of Pakistan.

Mansoor Khan, Ishaq Bhatti, and Siddiqui (2008) examined the performance indicators of two Pakistani Islamic banks, the Meezan Islamic bank Limited, and bank Al-Baraka LTD Pakistan, through their profitability ratio, liquidity ratio, and solvency ratio. It was reported in the study that the Islamic banks' performance evaluation was very scarce. Moreover, the results of the banks showed satisfactory performance in liquidity, profitability, and solvency. Furthermore, the argument on the entrance of the Islamic banking sector in Europe and the USA was done that without finding sources for guaranteeing the depositors it cannot be possible, because in those markets it is the requirement of getting a license for banks.

Kakakhel, Raheem, and Tariq (2013) comparatively studied the performance of four banks present in Pakistan the sample of two conventional banks, i.e. MCB and HBL, and the two Islamic banks, which are the Dubai Islamic Bank and the Meezan Islamic Bank Ltd Pakistan for the time period from 2008 to 2010. The performance indicators which are liquidity and insolvency ratio were used in the study. However, the results of the study revealed more profitability of conventional banks compared to Islamic banks. The results of the study revealed that Islamic banks are more liquid compared to conventional banks. Moreover, the findings suggested that the Islamic banks' performance was better than conventional banks in the asset turnover ratio and insolvency ratios in Pakistan.

Khan, Khan, Shagufta, Ahmad, and Ilyas (2014) studied products of Islamic and conventional banks and raised a question about home financing. For finding the difference some descriptive tools like mean, median, mode, etc. were used for the analysis of data. Some differences were found. First Islamic banks deals in partnership products and the customer are more benefited than conventional banking. Second is that the risk of default is more in conventional banks, so the stress is also more in conventional banks as compared to Islamic banking. Third Islamic banks as corporate social responsibility contribute to society in the form of charity as the amount received in delay payment however in conventional banking that amount is kept as interest and considered as bank income.

Shafique, Faheem, and Abdullah (2012) studied the performance of the Islamic banking sector in comparison with the conventional banking sector during the 2007-2008 financial crisis. The study resulted that the financial performance of Islamic banks was affected due to the financial crisis, but in comparison with conventional banking, the effect was minor on the Islamic banks. Furthermore, it was reported in the study that the Islamic banks are less risky as compared to conventional banks. Additionally, it was claimed in the study that demand for Islamic banking has been increased in the Western world due to its stability during the financial crises.

Hunjra, Akhtar, Akbar, Rehman, and Niazi (2011) highlighted the quality of services and customer satisfaction towards Islamic banks and customer's awareness about Islamic banks.

The study used primary data collection using 167 questionnaires. For data analysis, SPSS was used, and AMOS was used for model testing. It was found in the study that the relationship was positive between the satisfaction of the customers and quality services like representativeness, compliance, and assurance. Moreover, the study concluded that quality services influence on customer satisfaction towards Islamic banks in Pakistan.

Butt et al. (2011) studied the barriers which occur to users and also to non-users of the Islamic banking sector. The study was conducted by selecting the users and also the non-users which are the conventional bank's customers only. The study used the primary method of data collection which received 109 responses. Hypothesis testing, cluster analysis, factor analysis was used. The barrier for non-users was narrow branches, inconvenient location, and people's perception that Islamic banks not fully following Islamic sharia principles.

Awan and Azhar (2014) comparatively studied consumer behavior towards the selection criteria of the bank and customer satisfaction. The study used the primary method of data collection of 200 consumers containing a questionnaire of 30 questions. For data analysis, SPSS 17 was used. Correlation, OLS, and regression analysis were used for finding the relationship between dependent and independent variables. The result was showing a positive and significant relationship between all variables. It is concluded that customer satisfaction is increasing day after day.

Manzoor, Aqeel, and Sattar (2010) studied the fast growth of awareness about Islamic banking among Muslims. Islamic banking is the best alternative for that of interest-based banks. The study's purpose was to look at the reasons which convince the number of consumers towards the Islamic banking side in Pakistan. The factors are determined by generating hypothesis and the Friedman test was applied. The factors included stability in financial crises etc. the study highlighted the religious factors such as interest-free banking and Islamic sharia board.

Moin (2008) studied the performance of the first full Islamic bank of Pakistan the name of which is the Meezan Islamic Bank limited in comparison with five other operating banks of Pakistan. This study evaluated the performance of Meezan Islamic Bank limited. The period of the study was from 2003 to 2007 in which different financial ratios were used to find banking performance. MBL was found less risky and less profitable, and less inefficiency and found more solvent in the comparison with the average of five other conventional banks. Moreover, the study found no significance in the liquidity of both banks.

Kouser and Saba (2012) comparatively studied the performance of Islamic banking, mixed banking (banks having both the Islamic and conventional branches) and conventional banking used CAMEL model. ANOVA was used to find significant differences. SPSS was used for data analysis. The study found that Islamic banking has good management competency as compared to conventional banking. Mixed banks have more profitability compared to fully Islamic banks and the other conventional banks, so the study concluded

that Islamic banking has a developing setup.

Hasan, Subhani, and Osman (2012) studied the selection criteria of Pakistani consumers towards Islamic banking. As there is seen high growth in the Pakistani Islamic banking sector. The study focused on the consumer's selection in Karachi Pakistan towards the Pakistani Islamic banks as Karachi is the financial hub of Pakistan. Some factors like low service charges and a high profit, convenience, service quality, and ATM, etc. are convincing the consumers towards the selection of Islamic banking.

3. Methodology

The study describes the methodological process which is carried out to achieve the set objectives of the study. Inline, first, this chapter explains the research design which includes population, and the detailed sample selection process for the study. Secondly, this chapter explains the data collection and data analysis process in detail. And finally, this chapter reveals the use of model along with its variable explanations, statistical techniques applied and hypothesis testing.

3.1 Population and Sample of the Study

The population of this study includes the Islamic banks in Pakistan and the banks that are offering Islamic windows. The study sample is the 5 Islamic banks from the Pakistan banking industry. The results of the subjected sample can be generalized from the banks that are offering Islamic banking windows.

Table 1. List of Islamic Banks operating in Pakistan

S. N	Bank Name
01	Al Baraka Islamic Bank (Pakistan)
02	Bank Al Habib
03	Bank Islami
04	Dubai Islamic Bank Pakistan Limited
05	Meezan Bank

Source: http://wiki.islamicfinance.de/index.php/Islamic_financial_institutions#Pakistan

These are five Islamic banks from Pakistan's banking industry, the operations of which are Islamic in nature, in the above list the names of the selected Islamic banks are the Meezan Islamic Bank, Dubai Islamic Bank Pakistan Ltd, Bank Islami Pakistan, Bank al-Habib and Al Baraka Islamic Bank Pakistan Ltd.

3.2 Model Applied in This Study

3.2.1 Altman's Model for Service Firms.

$$\mathbf{Z = 6.56\ (X1) + 3.26\ (X2) + 6.72\ (X3) + 1.05\ (X4)}$$

$$Z = 6.56_{(Liquidity)} + 3.26_{(profitability)} + 6.72_{(productivity)} + 1.05_{(insolvency)}$$

For the services firm, Altman's model is a designating model combined from four major ratios weighted with different coefficients. Altman's model for service firms can predict the failure of the banking industry five years prior to actual bankruptcy with 95 percent accuracy. More weight (6.72) is given to variable X3 which represents the productivity ratio, followed by 6.56 of X1 (liquidity ratio), 3.26 of X2 (profitability ratio), and the coefficient 1.05 of variable X4 which represents the insolvency ratio. This model is usually used for the higher accuracy level in diagnosing the financial distress of businesses and the probability of bankruptcy (Altman, 2000).

Table 2. Zones of Discriminations for Altman's (2000) Model of Service Firms.

Case 01	**If = Z > 2.9**	**(Safe Zone)**
Case 02	If = 1.21< Z <2.9	(Grey Zone)
Case 02	If = Z < 1.21	(Distress Zone)

Source: Altman, E. I. (2000). Predicting financial distress of companies: Revisiting the Z-score and Zeta Models.

3.3 Variables Explanation

$$\textbf{Model:} \quad Z = 6.56\ X_1 + 3.26\ X_2 + 6.72\ X_3 + 1.05\ X_4$$

Z is the dependent variable normally denoted by (Z-score). Z-score is used to represent bankruptcy, however, according to the interpretations of this model, if the value of the Z-score is higher, the bankruptcy chances will be very low and vice versa. The general working concept of the Z-score is graphically represented in Figure 1 below.

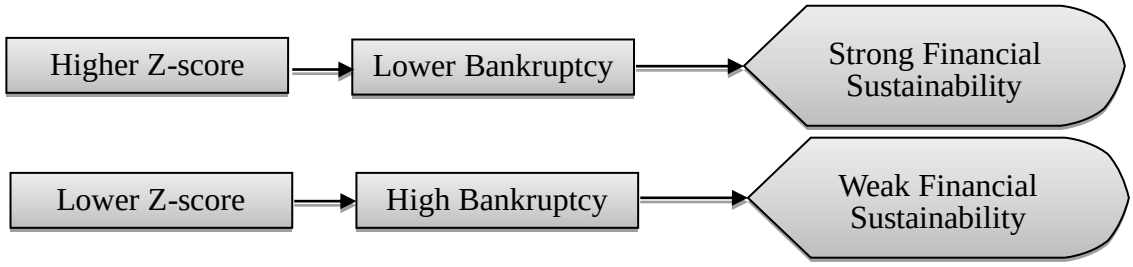

Figure 1. Working of Z-score

The number of independent variables is four which are used in Altman's model for services firm i.e.

X1 = Working Capital / Total Assets.

The ratio is used to measures the proportion of liquid assets with respect to the total assets of the firm. The difference in the current liabilities and current assets is said to be the Working

Capital. The excessive withdrawals of cash from the banks CASA cause liquidity crises. However, in a difficult time, liquidity is a quick source of a firm's savings.

X2 = Retained Earnings / Total Assets.

The ratio is used to measures the compound profitability of an institution, when the profitability is higher the firm will be safe. But, the age of the institution plays an effective role in forming this ratio. Usually, in the starting period of the firm, the retained earnings results are zero or negative.

X3 = Earnings before Interest and Taxes / Total Assets.

Earnings before Interest and Taxes is such a ratio that reports how much a company is generating profit with respect to its size. Altman realized that the variable x3 is an important variable for designing the model because it's performed well continuously, therefore, a high weight of 6.72 was suggested for this ratio. As Islamic banking does not use the concept of interest, in Islamic bank financial reports, EBIT was replaced with PBZT.

X4 = Book Value of Equity / Book Value of Total Liabilities.

The difference between the total assets of an institution and its total liabilities is known as the book value of equity. Mostly the given ratio is used to measure institution insolvency.

3.4 Conceptual Framework of Altman's (2000) model

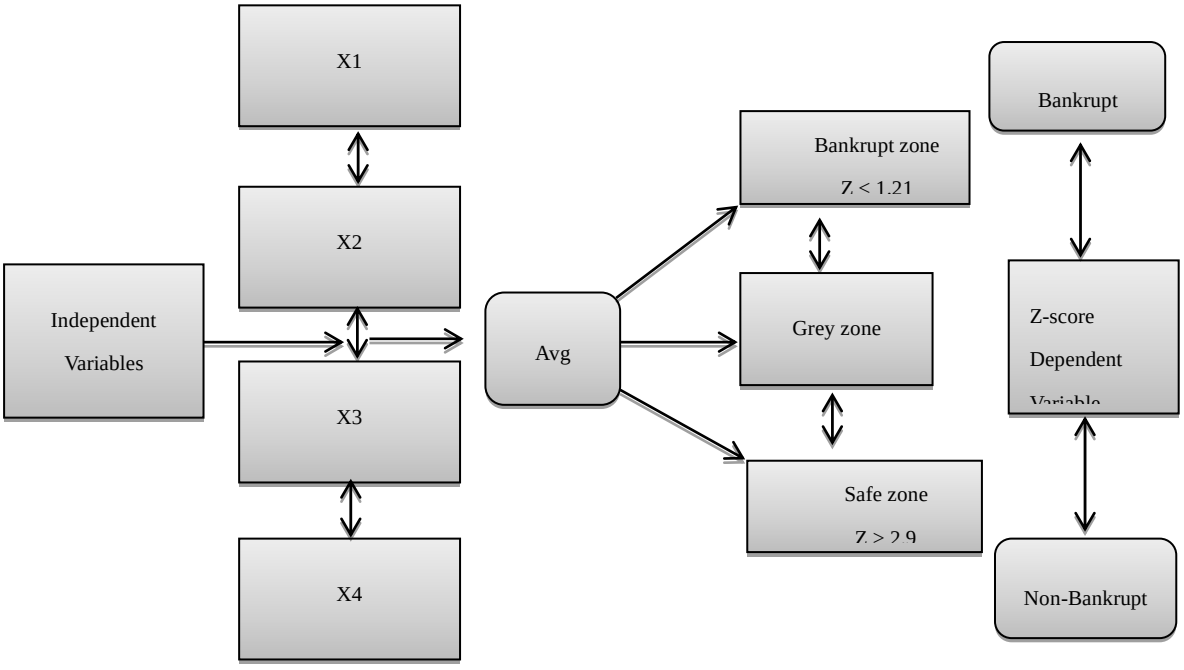

Figure 2. Conceptual Framework of Altman's Model

Figure 2 depicts the conceptual framework of Altman's (2000) model, which is used in this study. The model categorizes the economic position of a bank into three main possible zones

i.e. safe zone, grey zone, and the bankrupt zone. the dependent variable in Altman's model is the Z-score which will show that the tested bank is either bankrupt or non-bankrupt depending upon the collective score of its four independent variables i.e. if Z >2.90 bank is in the safe zone, but if Z< 1.21 bank will be in distress zone, however, if 1.21 < Z <2.9 the bank will be considered in the grey zone. Moreover, the grey zone with large will also be considered as part of the safe zone but with the high alert.

3.5 Hypotheses Development

Hypotheses development is done after setting the objectives of the study. For achieving the first objective of the study the below hypotheses were developed for the purpose to find that the Islamic banks of Pakistan do differ or not on their rates of bankruptcy.

H_1: Pakistani Islamic banks do differ on bankruptcy rates.

H_0: Pakistani Islamic banks do not differ from bankruptcy rates.

3.5.1 ANOVA

This study uses the ANOVA test which will explain whether the Islamic banks of Pakistan do differ among themselves on bankruptcy rates or not.

In line with the hypotheses set for achieving the second objective of the study i.e.

$H2_0$: Performance indicators do not have a significant positive impact on the bankruptcy profile of Islamic banks of Pakistan.

$H2_1$: Performance indicators do have a significant positive impact on the bankruptcy profile of the Islamic banks in Pakistan.

$H2_a$: *Liquidity has a significant positive impact on the bankruptcy profile of the Islamic banks in Pakistan.*

$H2_b$: *Profitability has a significant positive impact on the bankruptcy profile of the Islamic banks in Pakistan.*

$H2_c$: *Productivity has a significant positive impact on the bankruptcy profile of the Islamic banks in Pakistan.*

$H2_d$: *Insolvency has a significant positive impact on the bankruptcy profile of the Islamic banks in Pakistan.*

3.5.2 Multiple Regression

This study uses multiple regression for the illumination that which performance indicators used in Altman's (2000) model has a significant positive relationship regarding the bankruptcy profile of the Pakistan Islamic banking sector.

4. Findings and Discussions

The findings and discussion part of the study describe the descriptive statistics, secondly, it describes the tests for normality to see whether the data for empirical testing is normally distributed or not. And at the end, these chapters explain and reports the results of ANOVA and multiple regression tests, which are used to achieve the set objectives of the study.

4.2 Descriptive Statistics

Table 2. Descriptive Statistics

Particulars	N	Range	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Z-score	35	0.69	0.232	0.028	0.167	0.028
Liquidity	35	0.80	0.3597	0.03332	0.19429	0.038
Profitability	35	0.22	-0.0111	0.00921	0.05372	0.003
Productivity	35	0.35	0.0443	0.01438	0.08384	0.007
Insolvency	35	0.17	0.0941	0.00708	0.04126	0.002

This study used two tests for normality namely Shapiro-Wilk and Kolmogorov-Smirnov. Generally, if the P-values of the subjected tests is found greater than 0.05 the data for the subjected variable is said to be normally distributed and vice versa. Below are the results of both the tests which are stated in Table 3.

Table 3. Tests for Normality

Particulars	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	P-value
Z-score	0.172	35	0.010	0.927	35	0.023
Liquidity	0.090	35	0.200*	0.970	35	0.433
Profitability	0.172	35	0.010	0.886	35	0.002
Productivity	0.160	35	0.024	0.833	35	0.000
Insolvency	0.243	35	0.000	0.778	35	0.000

In the above Table 3, the P-values of both the tests for the majority of the variables are found less than 0.05. Therefore, it means that the distribution of data, in this case, is not performed normally. And hence, we need to transform the data before applying and statistical tests. Author Templeton (2011) reported the stepwise procedure of transforming abnormal data to normal. In-line with that, this study also transformed the data to make it fit for statistical testing. The results of the transformed data are shown in the below table 4 below.

Table 4. Tests for Normality (Transformed Data)

Particulars	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	P-value
Z-score	0.041	30	0.200*	0.991	30	0.996
Liquidity	0.050	30	0.200*	0.986	30	0.948
Profitability	0.058	30	0.200*	0.986	30	0.947
Productivity	0.041	30	0.200*	0.992	30	0.998
Insolvency	0.062	30	0.200*	0.981	30	0.852

Table 4 reported the results of tests for normality namely Shapiro-Wilk and Kolmogorov-Smirnov after data transformation. The values of all the variables after transformation are found greater than 0.05 which implies that the data for the subjected variable is normally distributed. And hence, we can proceed with further statistical tests.

Table 5. Overall Z-score Results

	Banks	2009	2010	2011	2012	2013	2014	2015	Avg	Overall zone
1	Bank al Baraka	0.225	0.043	0.351	0.098	0.112	0.044	0.096	0.013	DISTRESS
2	Bank al-Habib	0.354	0.330	0.380	0.430	0.413	0.395	0.433	0.391	DISTRESS
3	Bank Islami	0.338	0.003	0.012	0.460	0.383	0.447	-0.005	0.234	DISTRESS
4	Dubai Islamic Bank	0.762	0.718	0.682	0.717	0.577	0.574	0.398	0.6330	DISTRESS
5	Meezan Bank	0.463	0.356	0.251	0.495	0.457	0.392	0.389	0.4009	DISTRESS
#	**Average**	**0.428**	**0.290**	**0.335**	**0.440**	**0.388**	**0.370**	**0.262**	**0.359**	**DISTRESS**

Table 5 shows the overall results of the Z-score which represents the bankruptcy of all the selected Islamic banks of Pakistan. The study selected five Islamic banks shown in the above table. The results of all banks are reported in the above table 5 According to Altman's Z-score classification zones, all the selected Islamic banks of Pakistan are in danger zone and are financial distress.

Table 6. ANOVA Results

Particulars		Sum of Squares	Df	Mean Square	F	P-value
	Total	0.056	33			
Z-Score	Between Groups	0.445	5	0.089	5.176	0.002
	Within Groups	0.481	28	0.017		
	Total	0.926	33			

*** Significant at 1%, ** significant at 5%, * significant at 10 %

The above Table 6 is showing the results of ANOVA. This above test was applied to achieve

the first objective of this study that was "To analyze the bankruptcy rate of Pakistan Islamic banks" and therefore, the below-mentioned hypotheses were set to achieve it i.e.

H_1: Pakistani Islamic banks do differ on bankruptcy rates.

H_0: Pakistani Islamic banks do not differ in bankruptcy rates.

The above Table 6 showing the p-value for Z-score which represents bankruptcy is significant at 1% i.e. (0.002) which implies that the Pakistani Islamic banks do differ on bankruptcy rates. And hence, this study supports H1.

Table 7. Correlation Matrix

Particulars	Z-Score	Liquidity	Profitability	Productivity	Insolvency
Z-Score	1				
Liquidity	0.761**	1			
	0.000				
Profitability	-0.197	0.295	1		
	0.272	0.096			
Productivity	-0.120	0.344	0.781**	1	
	0.506	0.050	0.000		
Insolvency	0.353*	0.091	-0.545**	-0.557**	1
	0.044	0.616	0.001	0.001	
	33	33	33	33	34

*** Significant at 1%, ** significant at 5%, * significant at 10 %

- **Liquidity with Z-score**

Table 7 showing the results of the Pearson correlation matrix. For instance, the correlation of variable liquidity with Z-score is significant at 1% i.e. (0.000). Moreover, the coefficient value of liquidity in correlation with the Z-score is positively 5 % significant i.e. (0.761). Holistically, it implies that the increase in variable liquidity will positively affect the value of the Z-score and vice versa. The increase in the liquidity will increase the Z-score and when the Z-score will be increasing the bankruptcy will be decreasing, like that the decrease in the liquidity will decrease the Z-score which results in increasing the bankruptcy.

- **Profitability with Z-Score**

Table 7 showing the results of the Pearson correlation matrix. For instance, the correlation of variable profitability with Z-score is significant at 1% i.e. (0.096). Moreover, the coefficient value of profitability in correlation with the Z-score is positively 5 % significant i.e. (0.295). Holistically, it implies that the increase in variable profitability will positively affect the value

of the Z-score and vice versa. The increase in productivity will increase the Z-score and when the Z-score will be increasing the bankruptcy will be decreasing, like that the decrease in the productivity will decrease the Z-score which will result in increasing the bankruptcy.

- **Productivity with Z-Score**

Table 7 showing the results of the Pearson correlation matrix. For instance, the correlation of variable productivity with the Z-score is significant at 1% i.e. (0.000). Moreover, the coefficient value of productivity in correlation with the Z-score is positively 5 % significant i.e. (0.781). Holistically, it implies that the increase in productivity will positively affect the value of the Z-score and vice versa. The increase in the variable productivity will increase the Z-score and when the Z-score will be increasing the bankruptcy will be decreasing, like that the decrease in the productivity will decrease the Z-score which will result in increasing the bankruptcy.

- **Insolvency with Z-Score**

Table 7 showing the results of the Pearson correlation matrix. For instance, the correlation of variable insolvency with Z-score is significant at 1% i.e. (0.001). Moreover, the coefficient value of insolvency in correlation with the Z-score is negatively 5 % significant i.e. (-0.557). Holistically, it implies that the increase in insolvency will positively affect the value of the Z-score and vice versa. The increase in the insolvency will increase the Z-score and when the Z-score will be increasing the bankruptcy will be decreasing, like that the decrease in the insolvency will decrease the Z-score which will result in increasing the bankruptcy.

Table 8. Multiple Regression Results

Model		**Unstandardized Coefficients**		**T**	**P-value**
		B	Std. Error		
1	(Constant)	-0.036	0.039	-0.916	0.368
	Liquidity	0.885	0.067	13.208	0.000
	Profitability	-0.598	0.357	-1.674	0.107
	Productivity	0.780	0.228	3.427	0.002
	Insolvency	-0.227	0.375	-0.606	0.550

Dependent Variable: Z-Score (R-squared 0.80) (Error Term 0.20)

In order to achieve the second objective of the study which was “To evaluate the impact of individual performance indicator on bankruptcy profile of Pakistan Islamic banks” this study performed a regression test.

- **Overall Statistics**

The overall statistics of the above Table 8 showing that the R-squared for the above model is 0.80 and the error term is 0.20 which implies that the mentioned independent variables have explained the mentioned dependent variable of Z-score which denotes bankruptcy with 0.80

percent. The remaining 0.20 percent were not explained by the independent variables and hence termed as the error term. In above Table 8, two variables are found significant i.e. liquidity and productivity, while the other two variables i.e. profitability and insolvency are found insignificant in the model.

- **Liquidity**

In the above Table 8, the p-value for liquidity is found at 1% significant i.e. (p-value 0.000). Moreover, the value of its coefficient is found at 0.067 which implies that any unit, when increased in variable liquidity, will result in increasing the value of the depended variable Z-score by 0.067 units.

- **Profitability**

In the above Table 8, the p-value of variable profitability is found insignificant.

- **Productivity**

In the above Table 8, the p-value for productivity is found at 1% significant i.e. (p-value 0.002). Moreover, the value of its coefficient is found at 0.228 which implies that any unit, when increased in variable productivity, will result in increasing the value of the depended variable Z-score by 0.228 units.

- **Insolvency**

In the above Table 8, the p-value of variable Insolvency is found insignificant.

In light of the above explanation hypotheses, ***$H2_a$ and $H2_c$*** are supported which states that,

$H2_a$: *Liquidity has a significant positive impact on the bankruptcy profile of the Islamic banks in Pakistan.*

$H2_c$: *Productivity has a significant positive impact on the bankruptcy profile of the Islamic banks in Pakistan.*

Moreover, in light of the above explanation from Table 8 hypotheses, ***$H2_b$ and $H2_d$*** are not supported which states that,

$H2_b$: *Profitability has a significant positive impact on the bankruptcy profile of the Islamic banks in Pakistan.*

$H2_d$: *Insolvency has a significant positive impact on the bankruptcy profile of the Islamic banks in Pakistan.*

5. Conclusion

This study provides conclusions on the objectives of the research because the objectives were designed in line with the problem statement. Therefore, the conclusion is done on the basis of objectives set for the study is also representing the conclusion in line with the problem statement as well. The detailed discussions based on the statistical findings are presented

below.

The first objective of this study addressed the bankruptcy rates in the Pakistan Islamic banking sector. In line with the first objective, this study categorized Islamic banks into three zones by considering their performance i.e. the (Grey zone), (Safe zone), and the (Bankrupt zone). Empirical findings revealed that the Islamic banking sector of Pakistan does differ significantly in the bankruptcy zones. The possible reasons behind the bankruptcy rate of the overall sample of the Islamic banks from Pakistan are associated with factors like,

- Smaller bank size of Islamic banks
- Irrational competitive strategies adopted by Islamic banks
- Shortage of the Islamic banking sector in Pakistan.

The second objective of the study was to evaluate the individual performance indicators that have a significant positive impact on the bankruptcy profile of the Islamic banking sector. Altman (2000) put forward the argument that variable (liquidity), variable (profitability), variable (productivity) and variable (insolvency) are used to find the bankruptcy profile of the conventional banks. And Altman allotted different weights to these four variables in the Z-score model which are as under.

- Productivity weight: 6.72
- Liquidity weight: 6.56
- Profitability weight: 3.26
- Insolvency weight: 1.05

The result of multiple regression revealed that, the top four bankruptcy predictors which Altman used to find the bankruptcy profile of the conventional banks. However, this study found the weight of these four variables a bit different from that of Altman's. As in the Islamic banking perspective, the significance and weight of these four variables are found below.

- Liquidity weight: 0.761
- profitability weight: 0.295
- Productivity weight: 0.781
- Insolvency weight: -0.557

In light of the results obtained from the second objective of the study, it is concluded that all the variables used in the Altman Model (2000) can be used also in the Islamic banking sector. However, the parameter of its measurement may differ in the Islamic banking sector. For instance, the variable (X3) in Altman's Model i.e. (EBIT/ TA) was changed to (EBZT/TA) in the Islamic banking sector, because of that, the Islamic banks do not follow the concept of

interest. In this study, the changes made to Altman's model considering the need and core philosophy of Islamic banking have also highlighted the unexplored area and its importance too.

5.1 Limitations of the Study

Chieng (2013) argued that no singular model can explain all the possible aspects of corporate failure. Similarly, the Altman Model of service firm (2000) used in this study also has some limitations.

The bankruptcy evaluation model applied in the study needed the retained earnings as per variable (X3). But the retained earnings are directly interlinked with the age of an institution, as in the starting years of the firms the retained earnings are supposed to be negative or zero. However, the Pakistani Islamic banks are only incorporated in the mid-2000s. Therefore, the shortages of the banking industry lead to lower or negative retained earnings, which leads to an increase in the bankruptcy rates in the evaluation process.

Specific (internal factors), which are called the micro factors as well. However, Altman Model nowhere accommodated the macro factors like the inflation rate, interest rate, etc. It is evident that these macro factors have a great role in affecting the financial performance of firms (Chieng, 2013).

5.2 Suggestions for Further Studies

Firstly, Altman's (2000) Model for service firms used in this study, is composed of only banks' micro or internal factors i.e. variable Liquidity, variable Profitability, variable Productivity, and variable Insolvency. However, to further promote and improve Islamic banking, an updated bankruptcy model containing macro factors, and Islamic structural variables should be developed. In short, considering the limitations of Altman's (2000) model in predicting corporate failure, and the gap of corporate failure prediction model in Islamic banking industry, is directing and strongly persuading the researchers, to build a separate bankruptcy model for Islamic banking by considering the core philosophy of Islamic Sharia standards and Islamic banking rules and regulations.

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