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Feasibility Examination of '*Bankometer*' Model as an Early Warning Tool for Islamic Banks

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ABSTRACT

Prediction ability regarding the banking future is constantly exposed to financial disaster is of undeniable importance to central banks, bank management, and equity investors. When a bank goes out of money, i.e. bankrupt, creditors also lose the position of payments, whether the principal or interest and when equity investors lose all their investments. In summation, if the bank survives after financial distress, the survival costs will still reduce the financial growth. Thus, it is essential to encompass the factors that will be vulnerable to financial distress. To avoid repeating or even the occurrence of such stuff, there must be efficient measures that are helpful in at least identifying the advanced emergence situation of financial crises to help financial institutions save themselves from the hazards of the crisis. The study develops regression models based on 'Altman Z-score criteria' to examine multi-variables' impact on a bank's solvency. The solvency of banks is reviewed, and the results are expected to suggest a comprehensive mechanism to help Islamic banks understand that their solvency depends on the management of asset liability and current ratio.

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Introduction

Financial System in Pakistan:

Pakistan's financial system comprises the commercial banks (Islamic and conventional), Non-Bank Financial Institutions (NBFIs), Development financial institutions (DFIs), Microfinance Banks (MFBs), and Capital markets, Investment companies & real Estate Companies. SBP regulates all banks and manages monetary policy et., whereas; SECP supervises NBFIs, Nonbank financial institutions and Capital markets' business etc. The financial system is a mixture of commercial banks (Islamic and conventional), Non-Bank Financial Institutions (NBFIs), Development financial institutions (DFIs), Microfinance Banks (MFBs), and Capital markets, Investment companies & real Estate Companies. SBP regulates all banks and manages monetary policy, whereas SECP supervises NBFIs, Nonbank financial institutions, Capital markets businesses etc. The structure of Pakistan's financial sector is summarised in the below Table 1.1.

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Institution	Regulatory Body	Licensed under
Banks	SBP	Section 27 of BCO, 1962
of which: Islamic Banking Institutions	SBP	Section 27 of BCO, 1962
Microfinance Banks	SBP	Microfinance Institutions Ordinance 2001
Exchange Companies	SBP	Foreign Exch Reg Act, 1947
DFIs	SBP	
Nonbank financial institutions:	SECP	
Investment companies	SECP	Companies Ordinance, 1984
Asset Management Companies	SECP	Companies Ordinance, 1984
Mutual Funds and Plans	SECP	Companies Ordinance, 1984
Pension Funds	SECP	Companies Ordinance, 1984
Discretionary & Non-Discretionary Portfolios	SECP	Companies Ordinance, 1984
Real Estate Investment Trust	SECP	Companies Ordinance, 1984
Leasing Companies	SECP	Companies Ordinance, 1984
Modarabas	SECP	Companies Ordinance, 1984
Insurance companies	SECP	Companies Ordinance, 1984

Table 1: Pakistan Financial Sector
Source: State Bank of Pakistan – Financial Stability Report 2023

Banking Industry in Pakistan:

Considering the economic and financial conditions beginning to deteriorate in CY22, it has emerged as a challenging situation during H1CY23. Along with the persistent inflation and higher policy rates increasing up to 600 basis points 22.0 percent during the first half of CY23.

(PKR billion)	2019	2020	2021	2022	2023
FINANCIAL POSITION	1,987.1	2,014.7	2,276.9	1,829.3	2,953.9
Cash & Balances with Treasury & other banks	232.7	277.9	253.0	265.7	419.9
Lending to Financial Institutions	978.4	1,079.1	1,095.7	1,132.2	931.1
Investments – Net	8,939.4	11,934.6	14,554.4	18,400.0	21,504.3
Advances – net	8,248.9	8,291.6	10,120.5	11,818.2	12,059.7
Operating Fixed Assets	596.9	626.3	704.4	824.2	891.2
Other Assets	1,008	899.7	1,050.7	1,525.9	2,036.6
TOTAL ASSETS	**21,991.3**	**25,123.9**	**30,058.3**	**35,795.5**	**40,796.7**
Bills Payable	231.2	313.8	328.6	439,9	435.8
Borrowing to Financial Institutions	2,932.1	3,216.9	4,738.0	7,845.1	9,058.2
Deposits and Other Accounts	15,953.5	18,518.5	21,719.9	23,461.4	26,784.9
Sub-ordinated Loans	123.2	121.9	122.8	161.6	175.0
Deferred Tax Liabilities	43.6	46.5	8.0	9.8	13.1
Other Liabilities	1,049.5	1,043.8	1,199.4	1,792.0	1,995.2
TOTAL LIABILITIES	**20,333.1**	**23,261.4**	**28,116.7**	**33,709,8**	**38,462.2**
NET ASSETS	**1,658.2**	**1,862.4**	**1,941.6**	**2,085.7**	**2,334.2**
NET ASSETS REPRESENTED BY:					
Share Capital	556.9	556.1	568.0	592.8	613.9
Reserves	349.5	392.6	445.5	509.9	612.2
Unappropriated Profit	521.8	642.9	721.9	873.6	1,016.1
Surplus on revaluation of Assets	230.0	270.7	206.2	109.4	91.9
PROFIT AND LOSS STATEMENT:					
Markup and Interest Income after provision	695.7	729.4	788.6	1,118.7	809.3
Fees commission and brokerage	123.9	118.3	142.8	173.1	102.7
Dividend Income	12.3	10.8	18.0	21.7	12.9

Other Income	19.6	65.9	43.2	23.2	8.1
Profit and Loss before Taxation	304.5	411.4	451.1	703.0	554.6
Less Taxation	133.7	167.3	186.9	366.5	270.1
Profit and Loss after Taxation	170.7	244.0	264.2	336.5	284.5

Table: 2: Balance Sheet and Profit & Loss Statement of Banks

Source: State Bank of Pakistan – Mid-Year Performance Review of the Banking Sector (January –June 2023)

Large Scale Manufacturing (LSM) and Business Confidence Index (BCI) is still below its threshold level of fifty.

	(Share%)
Corporate Sector	72.1
SME Sector*	1.6
Agriculture	1.0
Consumer Finance	9.9
Commodity Financing	13.4
Others	2.0
Total	208

Table 3: Financing portfolio by Islamic banks in Pakistan September-2023

Source: State Bank of Pakistan – IBD Bulletin Sep- 2023

**Small and Medium Enterprises*

Islamic banking industry in Pakistan:

Presently, Pakistan has six full-fledged Islamic banks, of which Meezan Bank and Al Barak Islamic Bank are the large banks, while 16 banks operating dedicated Islamic bank branches as at the end of September 2023.

Type	Name of Bank	No of Branches
Islamic Banks	Al Baraka Islamic Bank	164
	BankIslami Pakistan Limited	303
	Dubai Islamic Bank Pakistan Limited	210
	Faysal Bank Limited	698
	Meezan Bank Limited	979
	MCB Islamic Bank Limited	199
	Sub Total	**2,553**
Islamic branches national Banks	16 conventional banks – branches	4,513
Sub Branches	Six Conventional & five Islamic Banks	153
	Grand Total	**4,666**

Table 4: number of branches

Source: State Bank of Pakistan – IBD Bulletin Sep-2023

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Islamic banking industry in Pakistan as on 30th September, 2023:

Following Table 1.5 depicts that one bank included in Islamic banking sector during 2022-2023 i.e Faysal Bank limited that shows an overall growth of 20 per cent in the sector with a growth in branch network from 4,191 to 4,534 shows 8.18 per cent growth. Islamic banks' total assets increased from Rs. 6,902 billion to Rs 8,417 billion with 21.95 per cent growth in September 2023, which shows an impressive growth against that of September 2022. The financing grew from Rs. 2,985 billion to Rs. 3,026 billion by 1.37 per cent while deposits increased from Rs. 5,021 billion to Rs. 6,160 billion by 22.68 per cent.

Pakistan Islamic Financial Industry Progress: (Billion Rupees)					
Period	**Nos.**	**Branches**	**Assets**	**Deposits**	**Financing**
Sep., 2023	6	4,534	8,417	6,160	3,026
Sep., 2022	5	4,191	6,902	5,021	2,985
Growth in %	20	8.18	21.95	22.68	1.37

Table 5: Major indicators of Islamic banks in Pakistan (Billion Rupees)
Source: State Bank of Pakistan – IBD Bulletin Sep-2023

As shown in above Table, the six full-fledged Islamic banks in Pakistan share more than 19.6 percent of Pakistan's banking industry. Their share in total number of banking industry (1.8 per cent) is equal to the share of public sector banks and slightly higher than the share of specialized banks. It is important to note that the share of Islamic banking industry is larger than this share of specialized banks and foreign banks in the industry. Despite this, Islamic banks float huge financings as compared to the financing floating by the public sector banks to the customers. This is alarming for Islamic banks as such huge financing creates possibilities of accumulation of non-performing financings (NPFs) that ultimately increases their credit risk. Islamic banks in Pakistan should therefore manage their financings to reduce non-performing financings and resultantly to minimize their credit risk, as credit risk has 80 percent probability of banks default (Khan, 1996). This study focuses on this observation and sets objectives of the study for the investigation of credit risk intervention into the solvency of banks of Islamic banks in Pakistan.

Islamic Banks in Pakistan:

The number of full-fledged Islamic banks in Pakistan increased from two in 2002 to six in 2023. Among them, Meezan Islamic bank and Al-Baraka Islamic bank are the largest banks,with quality retail businesses and cross-border transactions. These banks help the country improve its foreign exchange reserves. The growth of Islamic banking in Pakistan is therefore, partially the result of their international business relationships.

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S. No	Name of Full-Fledged Islamic Bank	Establishment Year	No. of Branches 30.09.2023
1	Al Baraka Bank (Pakistan) Limited	1991	164
2	Bank Islami Pakistan Limited	2006	303
3	Dubai Islamic Bank Pakistan Limited	2006	210
4	Meezan Bank Limited	2002	979
5	MCB Islamic Bank Limited	2015	199
6	Faysal Bank Limited	2022	698

Table 6: List of Full-Fledged Islamic Banks in Pakistan as on end of September, 2023
Source: IBD Islamic Banking Bulletin September, 2023- State Bank of Pakistan

Research Objectives:

Based on the background and motivations of the study, the following specific objectives of the study developed:

1. To propose 'Bankometer' Model as an early warning tool for the help of Islamic Banking industry to desist from shocks and Vulnerabilities of financial crisis.
2. To examine the Practicability of 'Bankometer' Model for the analysis of Islamic Banking industry Vulnerabilities.
3. To examine the practicability of 'Bankometer' Model for the analysis of Islamic Banks Vulnerabilities at the individual bank level.
4. To investigate the feasibility of adoption of 'Bankometer' Model for the analysis of Islamic Banking Vulnerabilities at the individual bank level in Pakistan.

This study uses regression equations to examine the feasibility of adoption of 'Bankometer' Model for the analysis of Islamic Banking Vulnerabilities at the individual bank level in Pakistan.

Research Questions:

As discussed above, more than 33 per cent Islamic banks in Pakistan could not absorb shocks of global financial crisis and were found inefficient in managing their credit risk, resultantly, their performance deteriorated accordingly. However, at what extent the global financial crises affected the nexus between credit risk and performance of these banks in Pakistan is not explored at yet. To resolve this issue, the following research questions have been raised with regard to the above research objectives. More precisely, this thesis aims to answer the following research questions:

1. What are the solvency positions of Islamic banks in Pakistan during the period from 2009 to 2020?
2. Do Islamic banks have early warning tools to save them from vulnerability of financial crisis for their better solvency?
3. Is Bankometer, as early warning tool, practicable to save Pakistani Islamic Banks from vulnerability of financial crisis during the period from 2009 to 2020?
4. Can Bankometer helpful to save IBIs from plausible future financial crises?
5. Is Bankpmeter helpful in mitigating the impact of the global financial crisis on the performance of Islamic banks in Pakistan?

Hypotheses:

H01: Islamic banks do not have better solvency positions during the period.
H02: Islamic banks do not have early warning tools to save them from financial crisis
H03: Bankometer as early warning tool is not practicable to save Pakistani (IBIs)
H04: Bankometer as early warning tool, cannot be adopted as tool by IBIs

Literature Review

The State Bank of Pakistan (SBP) introduced some guidelines in 2003 to enable banks in position to establish their own risk management systems (SBP Banking Services Department circular No.7, 2003). To monitor the adoption and implementation of these guidelines by the Islamic banks, SBP established its Islamic Banking Department (IBD). To meet the international standards and Basel requirements of risk management, IBD of SBP developed the framework that emphasizes their requirements; sound risk management structure, adequate risk management procedures for individual risk elements, monitoring of individual risk factors, risk management review mechanism and effective risk based supervision (SBP stress testing procedure for banks, 2005). SBP risk management guidelines (2005) also provide framework that addresses specific features of Islamic financing contracts. Islamic banks have to manage credit risk inherent in their financing relating to default, downgrading and concentration. Raghavan (2003) included three approaches in the menu of credit risk management, of which banks can adopt any one suitable to them.

Scholars analyzed performance of banks in different ways; Abu-Bakar and Tahir (2009) examined the bank performance with the use of financial ratios. Diamond (1984) developed a theory of financial intermediation under a moral hazard where the financial institutions have begun as delegated monitors. According to Saunders and cornet (2008), theory of financial intermediation, studies the role of financial institutions in resolving various financial contracting problems under asymmetric information. Moreover, according to Arby (2003), the performance of a bank can be defined as the incomes and productivity that reveals its capability to efficiently maintain present and future business. Further, with the development of an ample capital stand an institution can finance its growth and pay enough dividends to its shareholders. This determines the capacity to absorb losses. When assessing the bank's performance, financial ratios are mostly used for all kinds of analyses. Samad (2004) used internal factors of balance sheet and income statement to measure performance of banks in three categories; Profitability performance, Liquidity performance and Financing performance. The profitability performance comprises ROA, ROE and Cost to Income Ratio (COSR), while Liquidity performance measures have net loans to asset ratio, liquid assets to deposit and short-term fund ratio and net loans to deposit and borrowing ratio. In addition, financing performance measures include equity to asset ratio, equity to net loan ratio and total impaired loans to gross loan ratio.

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Fitch Ratings (2001) identifies that the banking system in Pakistan has steadily progressed from a feeble nationalized system to a somewhat improved and vigorous private sector driven system, over the last decade. As compared to the banks in Europe, banking sector in Pakistan resisted external shocks. On the other hand, banks in rising economies had to undergo reductions in credit lines and condensed financial flows. Based on the review of previous studies, it can be said that none of the studies investigated the feasibility of the practicability of early warning tool on the solvency and performance of Islamic banks in Pakistan. This study, therefore, undertakes to fill in this gap by proposing an early warning tool 'Bankometer' with examination of its practicability to analyze the solvency and performance of Islamic banks in Pakistan. For the investigation of Bankometer' practicability on the data of Islamic banks in Pakistan, this study replicates with the relevant variables of the studies conducted by Berger DeYoung (1997), Samad and Hassan (1999), Tafri et al (2009), Samad (2000) and Mohd Ariffin and Kassim (2010).

Methodology

Solvency in short term, in finance or business is the degree to which the current assets of an individual or entity exceed the current liabilities of that individual or entity. In long term, solvency is described as the ability of a corporation to meet its long-term fixed expenses and to accomplish long-term expansion and growth. Along with selling assets to reduce overall debt, an entity may opt to reorganize its business structure, increase owner equity or reinvest money and assets in the business. In addition, of course, struggling businesses should try to avoid taking on new debts until their solvency ratios improve. One of the primary objectives of any business is to have enough assets to cover its liabilities. Along with liquidity and viability, solvency enables businesses to continue operating. Assets are the things businesses own, and the liabilities are what businesses owe on those assets. Hence, a business tries to have enough assets to cover its liabilities. Calculate the total assets and total liabilities of the company.

Solvency Measures or Ratios:

Solvency often is measured as a ratio of assets to liabilities. For example, are there enough assets to pay the bills? The total liabilities amount is then divided by the total assets amount. This ratio is known as the debt-to-total assets ratio (**S1**), which assesses the amount of the assets of a company, which are financed by creditors. Another ratio measures solvency i.e. current ratio. In order to be solvent and cover liabilities, a business should have a current ratio of 2 to 1, meaning that it has twice as many current assets as current liabilities (**S2**). This ratio recognizes the fact that selling assets to obtain cash may result in losses, so more assets are needed.

A higher current ratio is typically better than a lower current ratio with regard to maintaining liquidity. A business should have a current ratio of 2:1 to be solvent and cover liabilities, which means that it has twice as many current assets as it has current liabilities. This ratio recognizes that selling assets to raise cash may result in losses so more assets are necessary. A business is solvent and not likely

to declare bankruptcy if its current ratio is over 2:1. Bankruptcy is a process you go through in federal court and is designed to help your business eliminate or repay its debt under the guidance and protection of the bankruptcy court. Business bankruptcies are usually described as either liquidations or reorganizations depending on the type of bankruptcy you take. These ratios are important for both business owners and for lenders. If a bank is considering a loan to a business, it will look carefully at these ratios to determine if the business already has too much debt and not enough assets to pay off that debt. Creating a business that is solvent, liquid, and viable is a continuing effort. But it's worth it because you will be creating a tremendous asset and building a business for the long term.

Studies on Early Warning System:

Despite many previous efforts, building an early-warning model is a complex task that involves numerous assumptions and practical choices that need to be made. New early warning models for financial crises have been developed and are being employed by central banks to monitor the stability of the financial system and to guide macro prudential policy (see, for example European Central Bank, 2010, 2017; Drehmann and Juselius, 2014).

Bankometer Procedure:

IMF informed that work is needed to define a smaller and more manageable subset of indicators to facilitate periodic monitoring and data dissemination (IMF, occasional paper-192, April 2000). Following IMF recommendations, this study introduced a procedure named 'Bankometer'. This procedure has smaller and manageable subset of indicators to facilitate periodic monitoring of banks' data. The quality of this *new method* is 'minimum number of parameters with maximum accurate results. With some improvements, it can be adapted by banks/central banks on regular basis to analyze the plausible vulnerabilities of banks financial system. In the year 2006, Azam Ali in his unpublished MPhil thesis from Institute of Business Management, Karachi, Pakistan, introduced a comprehensive procedure to calculate the solvency of the banks and named "BANKOMETER". This method has the quality of minimum number of parameters as below with acceptable results.

Parameters:

1. Capital Adequacy Ratio	40 %=< CAR>=08%
2. Capital to Assets Ratio	Capital / Asset >=04%
3. Equity to total Assets	Equity / Asset >= 02%
4. NPLs to Loans	NPLs / Loans =<15%
5. Cost to Income ratio	Cost / Income=<40%
6. Loans to Assets	Loan / Asset =< 65%

These percentages explain a bank that;

1. has capital adequacy ratio between 8% to 40%,
2. has more than 4% capital to assets ratio,
3. has equity to assets ratio greater than 2%,

4. has controlled non-performing loans (NPLs) ratio below 15% and
5. has maintained liquidity by controlling loans to assets ratio below 40%,

They may be categorized as solvent (to super sound) bank under the Bankometer procedure. The ability to predict which banks are vulnerable to financial distress is of critical importance to central banks, creditors and to equity investors. When a bank goes insolvent, creditors often lose portion of principal and interest payments, while equity investors can potentially lose all of their investment. Additionally, even if the bank survives after a financial distress, the survival costs will significantly reduce the future growth outlook. It is therefore important for management to focus more on trying to predict the banks that are vulnerable to financial distress in near future using Bankometer ratio, which is:

$$S = \alpha + \alpha_1 CA + \alpha_2 EA + \alpha_3 CAR + \alpha_4 NPL + \alpha_5 CI + \alpha_6 LA + Є$$

Where '**S**' stands for solvency
α_1 to α_6 are coefficients of IVs and **Є** is ther error term
CAR stands for capital adequacy ratio
CA stands for capital to assets ratio
EA stands for equity to assets ratio
NPL stands for non-performing loans to total loans
CI stands for cost to income ratio
LA stands for loans to assets ratio
and **50 < S < 70** is a boundry for solvency '**S**'

All banks that have the 'S' value more than 70 are solvent and are termed as super sound banks, while those banks having 'S' value below 50 are not solvent. The area between 50 and 70 is defined as gray area because of the susceptibility to error classification (Altman, 1968). In this study, insolvency risk, which is the inability of the bank to repay its debts and financial obligations because of bankruptcy, is measured by Altzman Z-SCORE through retained measure.

$$S1 = \alpha_0 + \alpha_1 CAR + \alpha_2 IBT + \alpha_3 DFLEV + \alpha_4 ME + \mu \quad (1)$$

$$S2 = \beta_0 + \beta_1 FDR + \beta_2 CR + \beta_3 + \beta_4 EQTA + \beta_5 LIQA + e \quad (2)$$

Where, **S1**= Total Liabilities /Total Assets &
S2= Current Assets/Current Liabilities,

CAR stands for Capital Adequacy Ratio, FDR stands for Finance to Deposit Ratio, ME stands for Management Efficiency, CR stands for Credit Risk (Infection Ratio), IBT stands for Income Before Tax, LIQA stands for Liquid Assets to Total Assets and solvency has two boundaries i.e. 1.0 < **S1** < 2.0 and other is 1.2 < **S2** < 2.0. A bank having 'S1' value as a debt-to-assets ratio below 1.0 would be seen as relatively safe, whereas ratios of 2.0 or higher would be considered risky or insolvent and mediocre if S1 lies in between 1.0 and 2.0. Whereas, 'S2' value is more than 1.2 is mediocre or not solvent. The bank's solvency found between 1.0 and 2.0 for S1 or found between 1.2 and 2.0 for S2 are defined as the zones

of ignorance or gray areas because of the susceptibility to error classification (Altman, 1968). However, If S2, a good current ratio, is 2 or more; means that the business has 2 times more current assets than current liabilities to covers its short-term obligations.

Solvency Measures or Ratios:

When a bank goes bankrupt, creditors often lose portion of principal and interest payments, while equity investors can potentially lose all their investment. Additionally, even if the bank survives after a financial distress, the survival costs will significantly reduce the future growth outlook. It is therefore important for them to focus more on trying to predict the factors that are vulnerable to financial distress. For banks to manage such situation, this study developed the following two models (based on Altzman Z-score) to examine the solvency of banks of different natures of solvency i.e. S1 and S2.

Acquisition of Data:

The data for the analysis acquired from the audited annual financial statements of Full-fledged Islamic banks operating in Pakistan and for the overall Islamic banking industry from Islamic Banking Bulletin, State Bank of Pakistan; for the period from FY2010 to FY2022.

	S1	S2	CAR	FDR	IBT	CR	EQTA	DFLEV	LIQA	ME
Mean	1.2665	0.3118	0.4098	0.5816	0.0077	0.4415	0.1747	0.1747	0.4237	0.0553
Median	1.1393	0.2923	0.5082	0.4886	0.0065	0.3862	0.1223	0.1223	0.4703	0.0513
Maximum	2.3173	0.5540	0.8546	1.0118	0.0313	0.6931	0.5685	0.5685	0.6350	0.3876
Minimum	1.0753	0.1371	0.0276	0.3070	-0.0005	0.0476	0.0700	0.0700	0.1253	0.0131
Std. Dev.	0.3302	0.1115	0.2023	0.2230	0.0064	0.1413	0.1403	0.1403	0.1510	0.0453
Skewness	2.1910	0.3579	-0.2769	0.5329	1.7581	0.1244	1.9395	1.9395	-0.4297	6.1234
Kurtosis	6.1682	1.8900	2.1807	1.7655	6.3043	2.3066	5.2351	5.2351	1.6421	45.628
Jarque-Bera	79.191	4.7243	2.6489	7.2045	63.060	1.4698	54.283	54.283	6.9945	5327.7
Probability	0.0000	0.0442	0.0559	0.0272	0.0000	0.0395	0.0000	0.0000	0.0302	0.0000
Sum	82.323	20.267	26.642	37.804	0.5030	28.698	11.356	11.356	27.541	3.5946
Sum Sq. Dev.	6.9809	0.7965	2.6206	3.1843	0.0026	1.2780	1.2605	1.2605	1.4611	0.1319
Observations	65	65	65	65	65	65	65	65	65	65

Table 7: Descriptive Statistics

Results

The procedure based on sensitiveness of the ratios that affect the solvency of a bank when they are multiplied with weights. The value of '**S1**' for a solvent bank is 0.95 or less and value of '**S2**' for a solvent bank is 1.2 or more. If a bank succeeds in controlling the value of both **S1 & S2** on long-term basis it will remain solvent. Whereas, having lower or mediocre values of both **S1 & S2**, it is difficult to predict a bank as solvent. These limitations need further work to improve it in the PhD thesis in future. Following are the results arrived at by applying the models to the data of overall Islamic banks for the period of study.

$$\mathbf{S1 = 0.7384 + 0.0107*CAR + 1.2736*IBT + 2.4523*DFLEV + 0.2016* ME} \quad (1)$$

$$S2 = 0.0562 + 0.1529*FDR + 0.2476*CR + 0.1115*EQTA + 0.6824*LIQA \quad (2)$$

Bank	Albaraka Bank		BankIslami		Dubai Islamic		Meezan Bank	
Year	S1	S2	S1	S2	S1	S2	S1	S2
Jun-10	0.91	0.59	1.09	0.43	1.09	0.49	1.07	0.49
Jun-11	0.92	0.56	0.97	0.51	1.04	0.53	1.07	0.50
Jun-12	1.30	0.85	0.96	0.57	1.00	0.56	1.04	0.53
Jun-13	1.17	0.72	0.76	0.55	1.04	0.56	1.02	0.48
Jun-14	1.13	0.68	0.90	0.56	0.96	0.50	1.01	0.47
Jun-15	1.13	0.70	0.90	0.51	0.94	0.49	0.99	0.47
Jun-16	0.56	0.20	0.95	0.51	0.95	0.51	1.00	0.43
Jun-17	0.56	0.20	0.92	0.49	0.96	0.52	0.98	0.40
Jun-18	0.57	0.33	0.93	0.46	0.98	0.51	0.96	0.39
Jun-19	0.68	0.26	0.92	0.49	1.00	0.50	0.99	0.44
Jun-20	0.68	0.33	0.90	0.52	0.99	0.41	1.00	0.31
Jun-21	0.67	0.32	0.87	0.52	0.97	0.52	1.03	0.46
Jun-22	0.66	0.29	0.90	0.52	0.99	0.50	1.04	0.55

Table 4.6: Findings of S1 & S2 by applying models on individual bank's data

The table shows year-wise values of S1 and S2 after running regression models on the individual selected four Islamic banks' annual data for the period from 2010 to 2022.

Conclusion

In conclusion, it can be seen that the investigation of the proposal of adaption and implementation of Bankometer for the Islamic banks of Pakistan done by analyzing Islamic banking industry data on aggregate basis and on selected four individual Islamic banks of Pakistan using almost all of the relevant risk and solvency variables of Islamic banks in the study.

Recommendations

The study provides following general recommendations that might help Islamic banks in Pakistan to improve their risk management system with proper proper adaption of Bankometer.

This can be done if the banks follow the guidelines given by the regulator (SBP) and develop early warning systems to counter the plausible shocks of financial crises in future.

1. The investigation elaborates that lack of proper implementation of risk management policies indulges banks in critical situations that coerce them towards bankruptcy. Islamic banks in Pakistan need to develop sustainable systems to judge the worthiness of borrowers that help reduce the default risks. It is, therefore, recommended that these banks should improve their risk management policies by proper implementation of the Bankometer to maintain and strengthen their solvency.
2. Another important criterion to minimize the banks' exposure to financial risk is the appropriate administration of the financial leverage. The reason being that the share capital significantly influences the credit risk that inversely affects the performance and solvency of banks (SBP IBD

circular No. 02, 2009). The other recommendation for Islamic banks in Pakistan is to utilize their capital in financing schemes and to manage it to reduce their leverage.

3. Finally, based on above discussions, it is recommended that all full-fledged Islamic banks in Pakistan should develop early warning systems to adequately cope with the shocks of probable financial crisis, in future. This in turn helps these banks not only reduce their default risk but also enhance their soundness and solvency.

Recommendations for Islamic Banks' Regulator:

1. The Pakistani Islamic banks' regulator, SBP, should ensure the effectiveness and implementation of early warning tools in its current policies. Improvement and corrective measures in the existing policies are required to prevent banks from financing-disbursements to so called potential borrowers who habitually delay their repayments. Shari' ah board of Islamic banking department of SBP may be given the task to develop leak proof laws for the implementation of early warning tool 'Bankometer' to handle the instruments of financing to professionally grip such situations (SBP IBD circular No. 02 and circular No. 04, 2008).
2. Regulator should conduct periodic reviews on the quality of financing disbursed to borrowers to enhance the confidence of the general public in Islamic banks. Further, the regulator needs to improve monitoring and supervision of Islamic banks with a critical focus on the adoption and implementation of early warning tool implementation policies to improve rules and regulations of banking procedure and objectives to serve customers with the best available facilities with them. It is further recommended that the principle 2.3 of IBD circular No. 01 of 2008 should be revisited to bind banks to develop appropriate financing strategies.

The regulators of Islamic banks in Pakistan should improve their supervisory framework to manage their day-to-day business that resultantly strengthens the early warning system of the country. The investigation reveals that there is lack of availability of early warning tools with Islamic banks. Regulator need to pay attention to develop effective policies for the development and implementation early warning tools to help banks efficiently manage the specific variables that support risk management for the improvement their solvency and soundness.

Future Recommendation:

The findings of the study pave the way for a number of studies that can be conducted to investigate the following areas that will also widen the scope of this dissertation.

1. It is recommended to replicate the methodology used in this study by including the conventional banks in Pakistan in the analysis. The application of Bankometer on the Islamic banks and conventional banks may provide a broad picture of their capability of management of risk to help manage solvency of banks.
2. A cross sectional study of all countries having Islamic banks, is recommended to develop laws for the adaption and implementation of early warning tool 'Bankometer' to help banks' handle the important variables for a generalized conclusion. For this, data can be analysed using
3.

Bankometer as latest method on SAARC countries or on all those countries data that have Islamic banks.

4. Inclusion of external variables like GDP, Inflation and Rate of return are recommended in those countries where these variables are available on biannually basis.

Conclusively, the variables used in this study are based on the current practices in the Pakistani Islamic banking sector. Researchers, wish to conduct study on Islamic banks in Pakistan, may extend this study by including some new variables by replacing the insignificant areas that found weak in this thesis for the investigation risk management practices using Bankometer for soundness and solvency of Pakistani Islamic banks.

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