



Impact of Asset Quality on Financial Stability of Islamic Banks in Pakistan: A Moderating Role of Corporate Image

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Abstract

The study encompasses the financial stability management in the Islamic banking industry in Pakistan keeping in view the impact of asset quality and moderating role of corporate governance. Five Islamic banks were selected for the study, and secondary data was analyzed and obtained from the annual financial reports for eleven years from 2010-to 2020. After using descriptive statistics, correlation analysis, variance inflation factor, regression analysis, and fixed and random effect model, results show that CAR and LDR significant impact on z-score whereas Bs, Bind, and CEO duality are positively significantly associated with z-score. Moreover, the mean average value of financial ratios shows that LDR and CAR have a better impact on z-score than the NPL.

Keywords: Financial Stability, Asset Quality, Corporate Governance, Islamic Banking

1. Introduction

1.1. The Islamic Banking System

The Banking Industry is a system of the different financial institutes that are authorized by the state to stream its banking services. The main services related to storage, moving, and extending a credit against the risk that industry faces withholding various forms of wealth, and these services are offered within the given time evolves with changes in the regulation in the industry, development of the economy (Tabak et al. 2016). Banks are financial intermediate of contractual arrangements which play the role of a party of transferring the funds through a proper procedure from ultimate saver to user and encourage the economic activity. All types of banks manage high leveraged portfolio assets and liabilities (Sironi 2018).

The rise of Islamic banking industry was started primarily in Egypt. It was owing to the struggles of Ahmad El Najjar who established a saving bank on the basis of turnover sharing in in Egypt which name was Mit Ghamar in the year of 1963. Pakistan, as a Muslim country, offers a fertile field for Islamic banking development. The Organization of Islamic Countries is called (OIC) later established Islamic Development Bank (IDB) in 1974. (OIC). It was not founded with the sole objective of promoting Islamic banking, but rather to support development projects in member countries (Taib, Ashraf, and Razimi 2018). In December 2001, in order to encourage Islamic banking system in Pakistan, the State Bank of Pakistan began revising and ratifying its financial sector strategy. Regulators took a measured approach to promoting Islamic banking. Islamic banks received permit certificates, and Al-Meezan Investment Bank became the country's first ever Islamic investment bank. In order to aid authorities in promoting Islamic banking in Pakistan, traditional banks have also been encouraged to open Islamic banking window branches. (Asad et al., 2018).

1.2. Financial Stability

Global financial crisis began in the United States and spread to European countries before spreading to the rest of the world. This crisis has revealed more complex macro-financial links in the monetary policy transmission mechanism. This new policy has shifted policymakers' focus to financial stability. To maintain financial stability, it is compulsory to understand critical macroeconomic trends, banking system dynamics, and the source of risk in the financial system. Furthermore, revising monetary policy objectives strengthens regulation, and using macroprudential methods as a balance to monetary policy is also required to maintain financial sector stability (Alqahtani & Mayes, 2017). Financial stability is a multidimensional phenomenon in which financial institutions ensure efficient allocation of financial resources and are capable of performing critical macroeconomic functions even in the face of financial imbalances and shocks (Nasreen, Anwar, and Ozturk 2017). Because of recent global financial disaster (2008), financial stability become a primary goal for the global economy, and the primary function of capital requirements is to maintain financial stability. Over the last two decades, our financial institutes, such as the IMF and World Bank, have attempted to improve economic development and financial stability by implementing appropriate supervisory practices and financial regulation for their financial systems in response to the recent global financial crisis (Anarfo and Abor 2020). Improved performance in these three aspects of sustainability (economic, environmental, and social performance) increases financial stability of institutions, and financial stability promotes growth and inflation (Orazalin, Mahmood, and Narbaev 2019). Financial instability in the banking sector is caused by the increase in non-core liabilities and rapid growth in credit. A grouping of banking, currency, debt, and inflation crises, as well as a stock market meltdown, caused financial instability in Argentina from 2001 to 2003. (Fouejieu, Popescu, and Villieu 2019). Capital requirements are strict. The adequacy requirement causes banks to established a strict standards for conceding loans, lowering their acquaintance to default risk and reducing their exposure to systematic risk through higher capital (Oduor, Ngoka, and Odongo 2017). Non-performing loans and unresolved liabilities are indicators of financial stability. NPLs provide a clear picture to stakeholders about the banks' profit/loss, and the bank's profit will be overstated due to the lack of loan loss provision. The uncovered liability ratio calculates the difference between liabilities and assets (Babar et al. 2019).

1.3. Asset Quality

Bank management focuses on various factors that contribute to a bank's performance. One of the most imperative of these factors is asset quality, which is also identified as loan quality and has the same meaning. Loans are the primary source of income for any institution, firm, company, or bank in order to maintain its overall financial stability, and the maintenance of such loans is a critical key for which an institution is responsible. To make a profit, the quality of the productive assets must be maintained at a high level.

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Asset quality assessment is expected to evaluate the condition of a bank's assets as well as adequacy of credit risk management. This demonstrates the bank's concern about asset quality in relation to credit risk as a result of fund allocations in various portfolios (Elsa, Utami, and Nugroho 2018). Asset quality is critical for stabilizing an economy, which is a critical component for the financial market to manage all of its operations. In the financial market, asset quality is related to loan quality, which is measured by non-performing loans (Kadioglu and Ocal 2017). A bank stability is largely dependent on the bank's resilience system, and maintaining the stability of any institution necessitates managing its asset quality. Non-performing assets are a permanent part of a financial institution's balance sheet, and they must be justified or they will become the source of the financial institution's crisis (Das 2023). Bank loans affect asset value and ensure the allocation of resources from banks to users; price also affects asset fundamentals; if price fails to do so, asset fundamentals may be understated or overstated. In this case, the bank cannot determine the value of an asset (Salike and Ao 2018).

Banks with lower asset quality may seek more diverse revenue to compensate for losses due to deteriorating loan quality and less income volatility, whereas banks with higher asset quality may not find income diversification for the banks with more underperforming loans (Ahamed 2017). Asset quality owns all assets owned by banks in order to generate expected income, and NPL is a key indicator of asset quality used to analysis the performance of the bank's functions. Banks continue to fail to manage their businesses and face liquidity and profitability issues as outcome of high non-performing loans, which may lead to bank instability (Al-Homaidi et al. 2018).

Non-performing loans are used to measure asset quality, which is a component of loan portfolio quality in banks. When interest and principal are not paid for three months, the loan becomes non-performing and has impact on the bank's stability. Non-performing loans, loan to deposit ratio are well-known key measures of asset quality (Abdulazeez, Lawal, and Yabagi 2019). The economic financial system and banking system rely on good loan portfolio management as this contribute a vital factors in stabilizing the economy and ensuring stability. Banks are responsible for maintaining asset quality in order to achieve profit. Failure to stabilize the banking system could result in a financial crisis. As a result, any financial institution's asset quality must be maintained by maintaining its loan portfolio (Yang and Gan 2019).

1.4. Corporate Governance

Corporate governance is a set of institutions which is responsible for providing efficient and effective oversight of a company's operations. It is a method of fostering market self-sufficiency and business dependability. Corporate governance is a structure in which a corporation is governed by its chief executive officer, directors on board, and the senior management. The Board of Directors is highly internal component of CG (Singh et al. 2018). Corporate governance can play a better role in the building blocks for firms to maximize profit and value through competitive advantage, improved performance, and contributing to a country's overall economy, and large board size with its two measures (ROA, ROE) has positive effect on firm's performance (Alabdullah, Ahmed, and Muneerali 2019). Good corporate governance can boost management performance by requiring management to account to shareholders (Muda et al. 2018). BoD is one of most significant part of C.G mechanism for managing firm growth, improving disclosure quality by observing management's activities and increasing the company's association with its stakeholders, and managing risk by sending good reports about the company's performance (Alkurdi et al. 2019).

Financial stability is the backbone of an economy and since the occurrence of the financial crisis financial stability has become the most important discussion around the world. Global and internal issues always affect Pakistan's economy. The political system of Pakistan along with the current affair of 9-11 situations in the region has shaken out the economy and the financial stability of the economy in Pakistan became a very big issue in financial sectors. Pakistan was considered a restricted area for foreign investors and visitors but over time situation has been changed (Khalid 2020). Maintaining the asset quality of financial institutions is crucial to ensure the financial sector's stability because this is a key factor that influence on financial stability and for the management of asset quality financial institution must be managed its non-performing loans (Battiston and Martinez-Jaramillo 2018). Corporate governance is also main aspect which contributes to attaining the stability of financial institutions (Sánchez Serrano and Peltonen 2020). Nowadays the global world has progressively been apprehensive with the solicitation of corporate governance in banks, also due to the vigorous progressive roles fulfilled by these banks in a numeral of economies (Alabdullah, Ahmed, and Muneerali 2019). Much fewer work has tried to examine the impact of asset quality financial stability as far as corporate governance is concerned for Islamic Banking Industry in Pakistan. In this research, we will investigate "Whether asset quality and corporate governance have impacts on financial stability in Pakistan's Islamic banking sector."

2. Review of The Literature

Orazalin, Mahmood, and Narbaev (2019) investigated effect of sustainability reporting practices on the financial stability from 2012 to 2016 of 45 largest oil and gas companies registered on the Russian Stock Exchange, Z-Score is used as a proxy for financial stability measurement tool and the SR index to assess the overall quality of each company's sustainability disclosure. According to the study's findings, companies can improve their financial stability in order to reduce risk, and firm characteristics such as firm size, financial capacity, and leverage can all have an impact on financial stability.

Kim, Batten, and Ryu (2020) used commercial bank data of all OECD countries to examine effect of diversification on the financial stability. Z-Score and Distance-to-Default risk are used as proxies for financial stability, ratio of non-interest income to operating income is used to measure bank diversification. Findings of the study shows that diversification intensifications have a negative impact on stability.

Tabak et al. (2016) conducted a well-known study on a joint impact of inflation target and policies of banking supervision on financial stability using the Z-Score model and balance sheet variables (size, liquidity ratio, cost to asset ratio, and customer deposit ratio) and economic activity variables (property right index, financial freedom index, economic openness,

and GDP cycle). According to the study's findings, price stability and stronger bank supervision are positively related to bank's financial stability.

Using data from 23 countries from 1996 to 2016, Phan et al. (2021) analyzed the effect of economic policy uncertainty on financial stability. Z-score and market structure related variables, macroeconomic variables (GDP per capita), GDP growth rate, inflation rate, and three market structure related variables, domestic credit to private sector (CRE), bank concentration (CON), and bank deposit to GDP (DEP), are used to analyze economic policy uncertainty. Results reveal that EPU has statistically significant detrimental influence on the stability. In countries with higher levels of competition, the negative effects are more pronounced.

Noman, Gee, and Isa (2017) used Panzar-Rosse H-statistic, Lerner index, and the Herfindahl-Hirschman Index (HHI) to observe the effect of competition on stability of financial sector of commercial banks (Association of South Asian Nations), while Z-Score and equity ratios were used to measure financial stability. Estimates from a two-step system using the generalized method of moments (GMM) show that the competition as examined by the H-statistic, positively associated with the Z-score and the return on equity but insignificantly associated with the NPLs. Contrariwise, there is negative relationship between Lerner index market and Z-score and to the return on equity and significantly linked with non-performing loans. Findings strongly keep up the competition-stability to association of south Asian banks.

Neaime and Gaysset (2018) used the Generalized Method of Moments (GMM) and Generalized Least Squares (GLS) econometric models with great number of 8 MENA countries from 2001 to 2015 to examine the relationship between financial inclusion, income inequality, poverty, and financial stability. The World Bank's Global Financial Inclusion Database was used to calculate financial inclusion per country. Other variables are taken from the Global Financial Development Database and the World Development Indicators. Findings show positive link among financial inclusion and financial stability while having no effect on income inequality or poverty.

Alqahtani and Mayes (2018) checked the financial stability of Islamic & conventional banks during financial shocks since 2000-2013 using the sample of 76 banks from Gulf Corporation council region and results indicates that during financial shocks Islamic banks suffered higher instability and small Islamic Banks perform better during the economic downfall than large Islamic Banks. Islamic Banks loss their stability during the increase their scales.

Bouheni and Hasnaoui (2017) used an unbalanced dynamic panel with the generalized method of moment's system to study a cyclical behaviour of financial stability of 722 commercial banks in the Eurozone. The natural logarithm of annual GDP growth (GDP G) and Z-Score are used as proxies to measure financial stability's cyclical behaviour. The findings indicate a negative significant relationship between the business cycle and bank risk-taking, indicating financial stability.

Ijtsma, Spierdijk, and Shaffer (2017) analysed the connection among banking concentration and financial stability whereas keeping together level of stability (bank & country) of EU-25 over the period of 1998-2014 by using Z-Score model and ensuing macroeconomic variable quantity such as; rate of real GDP growth, GDP per capita, inflation, and interest rate used for measure banking concentration on financial stability. Findings of the study indicate stability at both level (country & Bank) hardly effected by Concentration.

Oduor, Ngoka, and Odongo (2017) investigated how improved capital requirements deliberate banking industry reduces rivalry with poor stability of financial sector in the banking system, and how improved capital beef-up suggestively rises financial instability in the banking system of Africa while analysing the implementation of boosted banking capital adequacy requirements under Basel-111 for the improvement of financial stability in Africa by using GDP per capita growing rate as an pointer.

Dafermos, Nikolaidi, and Galanis (2018) used an ecological macroeconomic model to study the effects of climate change on financial stability from 2016 to 2020. They discovered that climate change-induced financial instability can have a negative impact on credit expansion and economic activity, and that the implications of green corporate programs can help to reduce climate-induced instability.

Elsa, Utami, and Nugroho (2018) observed the impact of efficiency and asset quality on Indonesian conventional and Islamic banks from 2008 to 2016. The Z-Score is used as a proxy for stability, the non-performing loan ratio used as a proxy for asset quality, and the overhead cost and cost income ratios are used as efficiency proxies. According to the findings, conventional banks have significantly higher asset quality and efficiency than Islamic banks.

Kadioglu and Ocal (2017) studied impact of asset quality on financial stability by using Panel regression technique to the periodical data of 55 banks of Turkey, in 2005 to 2016. Ratio of non-performing loan, provisions of non-performing loans used as a measure of asset quality, ROA and ROE are used to the measure the stability. Research found negative relationship among non-performing loan and bank profitability in Turkey and also found that the higher non-performing loans, poor quality of asset leads to lowermost ROE and ROA.

Ma et al. (2021) investigates the effect of private ownership on leverage, asset quality and profitability of State-Owned-Enterprises by using PSM-DID model on panel data SEO over the period from 2010-2018. Findings show that improved private ownership decline financial leverage and rise the asset quality and profitability moreover growth in private ownership can boost asset quality in monopoly trade rather than competitive industry.

Al-Homaidi et al. (2018) analyse the influence of asset quality proxies (LDR, NPL, BOPO and CAR) on financial stability (ROA, ROE) of foreign banks by followed the descriptive research method and secondary data obtained from company's annual reports and research found that these asset quality ratios have significant effect on profitability.

In Indonesia, Sumantri et al. (2021) investigate the impact of bank liquidity and asset quality on banking profitability. The study's focus was on state-owned banks. Annual reports from 2011 through 2020 were utilized to compile the statistics. Multiple regression analysis using panel data models was employed as the study approach. According to the findings, CAR

has no significant impact on profitability (ROA), however NPL and LDR have a considerable negative impact on profitability (ROA).

Using data from the Nigeria Deposit Insurance Corporation's annual reports and accounts, time series data as well as the CBN financial stability report, Adeola and Ikpesu (2017) explored the link among quality of asset and deposit money bank performance in Nigeria during a 30-year period from 1986 to 2016. Return on asset (ROA) is taken as proxy for Deposit Money Bank performance in Nigeria, ratio of non-performing loan to total loan (NPL), and ratio of liquid assets to total assets are among the study's factors (LAT). The findings suggest that ROA and deposit money bank performance in Nigeria have short-term connection. Furthermore, co-integration findings indicate the existence of long-run link between asset quality and deposit money bank performance in Nigeria.

Ngatno, Apriatni, and Youlianto (2021) investigated the moderate effect of corporate governance on the link among capital structure or business performance. This study relies on secondary data in the form of financial reports from 506 micro financial organizations (rural banks) as of the end of 2019. The Moderated Regression Analysis was used to examine the data. Capital structure financing decisions appear to have a beneficial impact on financial performance, according to the findings. The findings of moderation study indicate only board of commissioners can increase the association between capital structure and firm performance, whereas board size and ownership concentration cannot associate.

Al-Ahdal et al. (2020) investigated the impact of corporate governance mechanisms on financial performance taking sample of 53 non-financial listed companies in India and 53 non-financial listed companies in Gulf Corporation Council using ROE and Tobin's Q. Corporate governance ratios include board accountability or audit committee. Findings suggest that board accountability and audit committee have no influence on business performance, but transparency and disclosure have a negative impact, and Indian companies outperform those in the Gulf Cooperation Council.

Kamath (2019) studied the effect of corporate governance characteristics to intellectual capital presentation 95 companies registered in national stock exchange from 2010 to 2017 by using panel regression. Findings of the studies show that corporate governance characteristics have significant influence on Intellectual performance, board size and independent of directors have most significant impact.

Aslam and Haron (2020) observed the impact of corporate governance on the performance for 129 Islamic banks from 29 Islamic countries using generalized method of moment approach. For Islamic banks, corporate governance proxies include the audit committee, shariah board, and board size, while performance proxies include return on asset or return on equity. According to studies, the Audit Committee and the Shariah Board have a considerable favourable influence on Islamic bank performance as evaluated by ROA and ROE. The results of Islamic banking are uneven when it comes to CEO duality and non-executive directors.

Agyei-Mensah (2018) studied the impact of certain corporate governance's attributes and financial reporting lag and their impact on financial performance on chosen 90 firms in Ghana over the period of 2012-2014. Board size, board independence, firm size, leverage and board gender diversity were taken for the proxy of corporate governance's attributes and financial performance was measured by ROA and ROE. Descriptive statistics model and regression analysis performed for analysis of the variables. Findings of the research indicate a negative relationship between PNER and ROE on the impact of CG attributes of firm performance. The impact of rest of the CG variables on ROE could not be established because the results are not significant at any of the conventional levels of significance. According to the regression study, financial reporting latency shows a statistically significant negative link with company performance.

Suriawinata and Correia (2019) determine corporate governance's mediating role on the affiliation among dividend policy, capital system, or firm value. This research uses secondary data from 64 firms gathered through purposive selection from manufacturing companies registered on the Indonesia Stock Exchange (BEI) between 2014 and 2018. Inferential analysis approach is used in this study, which is done with Warp PLS Software. There is a considerable positive association between dividend policy and business value, according to this study. Capital structure, on the other hand, has no substantial positive link with business value. The corporate governance variable demonstrates that dividend policy has a considerable moderating influence on company value, while capital structure has a minor moderating effect.

Using a Chinese publicly traded company, Guluma (2021) explore the influence of corporate governance (CG) measures on firm performance and the role of management conduct in link between CG systems and firm performance. Internal and external corporate governance procedures were employed in this study, including independent boards, dual board leadership, ownership concentration as internal CG indicators, debt financing and product market competitiveness as external CG measures. From 2010 to 2018, the investigator used panel data from 11,634 models of Chinese publicly traded companies. The study used a system Generalized Method of Moments estimate model to assess the given hypotheses. According to the findings of the study, ownership concentration and product market competitiveness have positive significant connection with firm performance as examined by ROA and TQ. According to the empirical findings, managerial overconfidence has a negative influence between board independence, dual management, and ownership meditation and corporate success.

Using the world's top 1000 companies, Wu (2021) investigated the impact of board of independence on financial success. Ratio of the independent directors on and CEO duality are considered as indications of board independence. CEO duality and proportion of independent directors, according to the data, had positive influence on Return on Assets (ROA), a corporate performance indicator, respectively.

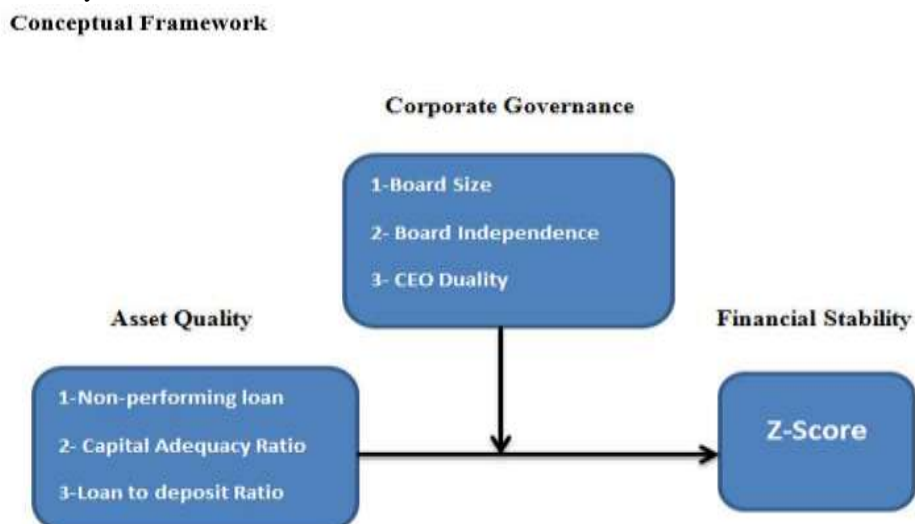
Okoye et al. (2020) investigates the relationship between Nigerian bank profitability and governance policies. Corporate governance is analysed with the size of board of directors and interests of directors, whereas financial success is examined by the ROA and ROE. The study's controlled variable is the company's size. The method of estimation utilized was the Generalized Method of Moments. The board size, directors' equity, and firm size all have substantial influence on the financial performance of Nigerian banks. In addition, research shows delayed return on equity has a considerable influence on current

performance. As a result, the study says that corporate governance has key influence to financial performance or recommends keeping board size to a minimum to minimize boardroom conflicts.

3. Theoretical Framework

Primary goal of the research is to study the factors that may contribute to the financial stability of Islamic Banking Industry in Pakistan. Conceptual model that follows is organized around the study’s purpose. Financial stability is influenced by both factors as mentioned in the above linked studies such as capital adequacy ratio, loan to deposit ratio, non-performing loan ratio as well as corporate governance’s measures; board size, board independence and CEO duality.

Theoretical framework of study is shown as:



A literature review is used to create the research framework. The approach emphasizes the importance of asset quality for Islamic Bank’s financial stability. Financial stability of Islamic banks is dependent variable that is examined by using the Z-Score method. Asset quality is the study's independent variable as evaluated by non-performing loans, (ii) Capital Adequacy ratio, and (iii) Loan to Deposit Ratio. Corporate governance which is the moderating variable of the study is evaluated by board size, (ii) board independence, and (iii) CEO duality.

To test the significance contribution the following regression model

$$FS_{it} = \beta_0 + \beta_1 AQ_{it} + \mu \dots \dots \dots I$$

$$Z\text{-Score} = \beta_0 + \beta_1 CAR + \beta_2 LDR + \beta_3 NPL + \mu \dots \dots \dots II$$

$$FS_{it} = \beta_0 + \beta_1 AQ_{it} + \beta_2 CG_{it} + \mu \dots \dots \dots III$$

$$Z\text{-Score} = \beta_0 + \beta_1 CAR + \beta_2 LDR + \beta_3 NPL + \beta_4 BS + \beta_5 Bind + \beta_6 Cd + \mu \dots \dots \dots IV$$

FS= financial stability

β_0 = alpha / intercept

Z-Score= Indicator for the measurement of financial stability

CAR = Capital Adequacy Ratio

LDR = Loan to Deposit Ratio

NPL = Non-Performing Loans

AQ= asset quality

CG= corporate governance

BS = Board Size

Bind = Board Independence

Cd = CEO Duality

Table 1: Description of Variables

Variables	Notations	Measurements
Financial Stability	F.S	Z-Score Non-Performing Loans Capital Adequacy Ratio Loan to Deposit Ratio
Asset Quality	A. Q	Board Size Board Independence
Corporate Governance	C.G	CEO Duality

In this study, panel data is used(Gil-Garcia & Puron-Cid, 2014) it can account for variance across different units over time by taking into account individual-specific features. It also delivers more useful data by merging time series and cross-section observation. It also uncovers and quantify effects that aren't visible in cross-section or time series data. The secondary data source was chosen by the researcher since it is less expensive in terms of time and money spent on data collection. It also

gives you the opportunity to obtain high-quality data. Secondary data comprising of financial ratios of the 5 domestic Islamic banks are used. The period of this study is confined to 2010-2020. Data of this study was obtained from Meezan Bank, Muslim Commercial Bank, Al-Barakah Bank, Bank Islami and Dubai Islamic Bank, while annual yearly reports for banks were obtained as of the bank website. The data was constructed based on the balance sheet, annual reports, income statement and financial statements of the concerned banks.

4. Results and Discussions

This section describes analysis of variables and the results originate by using STATA version 12 and Generalized Least Square (GLS). Consequently, the Analysis results of the study are described in different stages: first descriptive statistics are found, secondly the results are got by the measurement model, the results related to the structural model represent the hypothesized structural paths and the third is the result of the moderating effect in the structural model.

Table 2 shows a descriptive result of each variable that is used to assess the impact of Islamic Banks' asset quality from 2010 to 2020. The table also includes a descriptive statistic for the sample observation, as well as the mean, standard deviation, a maximum and lowest values for the study's components. A total of 55 observations are included in the table above. The Z-Score mean for financial stability is 29.33958, with a deviation of 22.11498 and maximum, minimum values are 68.08925, 0.063635, respectively. Asset quality, as defined by CAR, LDR, and NPL, is the study's independent variable. Average value of CAR 15.74073 with a deviation of 3.339281, maximum value = 22.25, minimum value = 10.17. The average LDR was 10908.63, with a standard deviation of 22237.83, maximum and minimum values of 68210.73 and 19.59771. The average NPL is 8.399709, with standard deviation of 8.031562, while the maximum and minimum NPL values are respectively 34.3 and 0.13. The average Board Size (number of the board members) is 10.14545, standard deviation = 2.013088, maximum and minimum values of 14 and 7, respectively. Average value of the board independence is 2.454545, standard deviation value = 0.939231, while CEO minimum value is 0 and the highest value = 4, mean value of CEO duality = 0.054546, a standard deviation of 0.229184, and lowest and maximum values of 0 and 1.

Table 2: Descriptive Matrix

Variable	Observations	Mean	Std. Dev.	Min	Max
Z-score	55	29.33958	22.11498	0.063635	68.08925
CAR	55	15.74073	3.339281	10.17	22.25
LDR	55	10908.63	22237.83	19.59771	68210.73
NPL. Ratio	55	8.399709	8.031562	0.13	34.3
Bs	55	10.14545	2.013088	7	14
Bind	55	2.454545	0.939231	0.0000	4
Cd	55	0.054546	0.229184	0.0000	1

Correlation coefficient of the variables, that range from -1 to 1, are shown in table 2 with symbolic signs (positive (+) and negative (-) which signify the direction for a relationship. There is a perfect positive linear connection between each variable and itself, as evidenced by diagonal correlation coefficient of 1.0000. The values of variables at a low level are shown in the above findings. These variables are not connected to one another, and there is little multicollinearity between them. For the correlated variables, the results define that non-Performing loan ratio and board independence negatively correlated with Z-Score. While capital adequacy ratio, loan to deposit ratio, board size, and CEO duality have positive linear with z-score. The negative relationship between non-Performing loan and board independence with z-score indicated an inverse means that the increase in non-performing loans and board independence will reduce the value of Z-Score that is accordingly not good for the asset quality of Islamic banks in Pakistan.

Table 3: Correlation Matrix for variables

	Zscore	CAR	LDR	NPL. Ratio	Bs	Bind	Cd
Zscore	1.0000						
CAR	0.3029	1.0000					
LDR	0.3188	-0.2836	1.0000				
NPL. Ratio	-0.1199	-0.1696	-0.2916	1.0000			
Bs	0.0855	0.2285	0.3248	-0.2749	1.0000		
Bind	-0.2428	-0.4579	0.2568	0	0.0232	1.0000	
Cd	0.2741	-0.0259	-0.1185	0.3829	-0.2583	-0.0313	1.0000

Each variable of the study has low multicollinearity with other variable. According to (Folli et al., 2020) A threshold of 0.7 is specified for correlation and significant multicollinearity between any two variables.. According to (Shrestha, 2020) any variable with a variance inflation factor (VIF) larger than ten (10) should be eliminated from the empirical model, according

to this theory. A high VIF indicates that the linked independent variable is highly collinear with the model's other variables. Below results shows less than 10 variance inflation factors of variable.

Table 4: Variance Inflation Factor

Variable	VIF	1/VIF
Car	1.6	0.626221
LDR	1.46	0.685308
NPL. Ratio	1.37	0.732156
Bs	1.36	0.735514
Bind	1.31	0.76525
Cd	1.22	0.817424
Mean VIF	1.39	

Findings of the regression analysis shows that financial stability of the Islamic banking industry which is represented with Z-Score value is positively significantly associated to the CAR value at the significant level of 1% because the P-Value for CAR is 0.000 which represents the asset quality of the Islamic banking industry of Pakistan. Coefficient value of the CAR is $\beta=1.478256$ which shows that if there is one unit change in CAR value, it effects the financial stability by 1.4728. The impact of Z-Score with loan to deposit ratio with the value of regression coefficient $\beta = 0.000147$ and value of $P= 0.458$ which is >0.05 shows positive insignificant relationship between z-score and loan to deposit ratio. If there is 1% change in LDR value then z-score is changed by 0.000147. The impact of non-performing loan on z-score value of regression coefficient $\beta= -0.1526$ and the value of $P=0.211$ which is > 0.05 which shows negative insignificant relationship of non-performing loan to z-score. If 1% changes in non-performing loans then z-score is changed by - 0.1526. The results of the study indicated that capital adequacy ratio as significant impact on z-score while loan to deposit ratio has positive insignificant impact on z-core and non-performing loan ratio has negative insignificant relationship with z-score.

Table 5: Regression Analysis

Zscore	Coef.	Std.Err Z	P> z	95% conf	Interval	
CAR	1.478256	0.379583	3.89	0.000	0.734288	2.222224
LDR	0.000147	0.000198	0.74	0.458	-0.00024	0.000535
NPL.Ratio	-0.1526	0.122006	-1.25	0.211	-0.39173	0.086524
Cons	5.749282	11.22058	0.51	0.608	-16.2426	27.74121

Table 6: Random Effect Analysis

Zscore	Coef.	Std.Err Z	P> z	95% Conf	Interval	
CAR	1.585165	0.855665	1.85	0.064	-0.09191	3.262236
LDR	0.000424	0.00012	3.53	0.000	0.000189	0.00066
NPL.Ratio	0.187692	0.325109	0.58	0.564	-0.44951	0.824894
BS	-5.15809	1.647028	-3.13	0.002	-8.38621	-1.92998
BIND	-4.83596	2.615348	-1.85	0.064	-9.96195	0.290026
CD	20.30451	10.85784	1.87	0.061	-0.97646	41.58548
_cons	-141.174	43.04298	-3.28	0.000	-225.537	-56.8115

The estimate technique was expected to be a fixed effect model or a random effect model, according to the study. The optimal of estimating approach largely depend by the findings of the Hausman Test. The random effect model was found to be a most acceptable estimating approach for the investigation. Despite the fact that the random effect model was shown to be the most appropriate estimate approach by the Hausman test, the robust random effect model was utilized in this study since it provides a more accurate estimation of the data. The outcomes of the Random effects research on the independent factor are shown in the table above.

Table 6 illustrates the regression study findings on dependent variable which is financial stability of five Islamic banks and measured by Z-Score. The independent variable is asset quality which is assessed by NPL, LDR and CAR, moderating variable is corporate governance which is examined with board size, board independence and CEO Duality.

Findings of study indicates positive significant relationship for the impact of capital adequacy ratio with z-score with value of coefficient $\beta=1.585165$ and P-value is 0.064 which $s < 0.10$. This shows that if 1% change in capital adequacy ratio which represents asset quality then z-score which represents financial stability is changed by 1.585165 and the relationship is significant at the level of 10%.

For the impact of loan to deposit ratio on z-score value of coefficient $\beta=0.000424$ and P-value $=0.0000$ which is < 0.05 , it shows if 1% changes occur in loan to deposit ratio financial stability is changed by 0.00042 and the relationship between the LDR and Z-Score is significant at the level of 1%. Relationship between non-performing loan and z-score is positive

insignificant with coefficient value $\beta=0.187692$ and P-value $=0.564$ which is > 0.05 if 1% change in non-performing loan then financial stability is changed by 0.187692.

For the impact of board size which represents corporate governance on z-score that is represented by z-core coefficient $\beta= -5.15809$ and P-value $=0.002$ which is < 0.05 , this shows significant negative link among board size and z-score., and the relationship significant at the level of 1%. If 1% change in board size then z-score is changed by -5.15809. For the relationship between board independence and z-core results are negative significant with the coefficient value $\beta= -4.83596$ and P-value is 0.064 which is < 0.10 . If 1% change in board independence, financial stability is changed by -4.83596 and the relationship is significant between the variable at the level of 10%.

For the impact of CEO duality on z-core with the value of coefficient $\beta=20.30451$ and P-value $= 0.061$ which is < 0.10 shows positive significant impact of CEO duality on z-score and the relationship between variables is significant at the level of 10%. If 1% change in CEO duality then financial stability is changed by 20.30451.

4.1. Discussions of the Results

First objective for the research study is “To analyse the impact of asset quality on financial stability of Islamic banking industry in Pakistan. Asset Quality is analysed with NPL, LDR. Financial Stability is examined by Z-Score. Regression analysis for the study shows non-Performing loan ratio is positively insignificantly associated with Z-Score this indicates that the increases level of non-performing loans ratio will decrease the level of asset quality for Islamic Banks in Pakistan which will negatively affect on financial stability its mean instead of non-performing loans, macroeconomic variables such as GDP, Foreign Investment will positively affect the asset quality. On the other side, Loan to Deposit Ratio and Capital Adequacy Ratios are positively significantly associated with Z-Score, shows that the increases in the level of these ratios will also increase the level of asset quality for Islamic Banks in Pakistan.

Second objective of study is “to examine moderating role of corporate governance between asset quality or financial stability of Islamic banking industry in Pakistan over the period of 2010 to 2020. Corporate Governance is examined with its measurements i.e., Board Size, Board Independence and CEO Duality. Regression analysis of the study shows; Bs and bind shows negative significant relationship to Z-Score. CEO Duality positively significantly related to Z-Score.

5. Conclusion

The impact of Asset Quality on financial stability of Islamic Banks with moderating role of corporate governance is examined in the study. The data used in the study is 5 Islamic Banks for the period of 2010 to 2020. Data for the study is gathered from the annual reports of banks from their official websites which gives 55 observations. The study used Asset Quality as independent variable with its measurements i.e., non-Performing loan Ratio, Loan to Deposit Ratio or Capital Adequacy Ratio. Financial stability is taken as dependent variable with Z-Score proxy as the measurement of financial stability. Results show the insignificant relationship of non-performing loans ratio between asset quality and financial stability z-score is used to measure financial stability. For the relationship between Loan to Deposit Ratio and z-score results show significant relationship between asset quality and financial stability here, findings support second hypothesis. Lastly, capital adequacy ratio also shows significant relationship between AQ and FS with z-score thus hypothesis is accepted. Board size, board independence and CEO Duality also shows significant relationship between asset quality and financial stability.

Asset quality is an important factor in sustaining financial stability in the banking industry, as changes in asset quality have an influence on the banks' overall performance. In terms of scope in terms of years and dimension in terms of data quantity, this research adds to the current literature on the banking industry. In addition, academic specialists, particularly those in the Islamic banking business, would be interested in this research. This is due to the empirical findings, which will be utilized to support the decision, as well as the study's limits and recommendations for further research. The results of the study will help policymakers in the development of new financial stability rules. The influence of asset quality on financial stability on Islamic Banking industry in Pakistan is seen as a critical part of the process of achieving optimal performance and productivity, which is a trend that has already begun in the Islamic Banking Industry in Pakistan. In addition, policymakers will be more likely to seek out methods to maximize and utilize their resources to the best of their abilities in order to decrease the rate of excess in the process of boosting asset quality and stabilizing the financial performance of Pakistan's Islamic banking industry. It has become necessary for practitioners in the Islamic Banking sector to enhance asset quality for banks to make ensure financial stability. However, an uncontrolled growth in the proportions of the non-performing loan portfolio can result in a loss of asset quality, putting financial stability at risk. When we look at the impact of asset quality on Islamic Banks' financial stability in Pakistan, we see that capital adequacy has a favourable impact. It may be concluded that, despite the fact that capital injection has a cost, it increases financial stability. These findings add to the current research, particularly in the milieu of evolving economies, through providing information on aspects that influence quality of asset and financial stability in the Islamic banking institutions. Following a thorough examination of asset quality and financial stability, policymakers and bankers may be better equipped to deal with future financial shocks by implementing suitable policies and procedures. In addition, this study would be beneficial in assisting in the formulation of financial stability choices and policies. The CEOs of banks should be encouraged to be devoted and dedicated to their roles so that they may utilize their depth of knowledge and credibility to successfully supervise the operations for board of directors, particularly for loan administration. Average board size of the banks investigated in this study should be maintained since it enhances bank's asset quality. However, in order to increase asset quality, they must be encouraged to be devoted to the banks' service.

References

Abdulazeez, Daniya Adeiza, Tajudeen Lawal, and Mohammed Yabagi. (2019). Board Structure and Asset Quality of Listed Deposit Money Banks in Nigeria. *Jurnal Riset Akuntansi dan Keuangan Vol 7(1)*.

- Adeola, Ogechi, and Fredrick Ikpesu. (2017). Macroeconomic Determinants of Non-Performing Loans in Nigeria: An Empirical Analysis. *The Journal of Developing Areas* 51(2), 31–43.
- Agyei-Mensah, Ben Kwame. (2018). Impact of Corporate Governance Attributes and Financial Reporting Lag on Corporate Financial Performance. *African Journal of Economic and Management Studies* 9(3), 349–66.
- Ahamed, M Mostak. (2017). Asset Quality, Non-Interest Income, and Bank Profitability, Evidence from Indian Banks. *Economic Modelling* 63, 1–14.
- Al-Ahdal, Waleed M, Mohammed H Alsamhi, Mosab I Tabash, and Najib H S Farhan. (2020). The Impact of Corporate Governance on Financial Performance of Indian and GCC Listed Firms, An Empirical Investigation. *Research in International Business and Finance* 51, 101083.
- Al-Homaidi, Eissa A, Mosab I Tabash, Najib H S Farhan, and Faozi A Almaqtari. (2018). Bank-Specific and Macro-Economic Determinants of Profitability of Indian Commercial Banks, A Panel Data Approach. *Cogent Economics & Finance* 6(1), 1548072.
- Alabdullah, Tariq Tawfeeq Yousif, Essia Ries Ahmed, and Mohammed Muneerali. (2019). Effect of Board Size and Duality on Corporate Social Responsibility, What Has Improved in Corporate Governance in Asia? *Journal of Accounting Science* 3(2), 121–35.
- Alkurdi, Amneh, Khaled Hussainey, Yasean Tahat, and Mohammad Aladwan. (2019). The Impact of Corporate Governance on Risk Disclosure, Jordanian Evidence. *Academy of Accounting and Financial Studies Journal* 23(1), 1–16.
- Alqahtani, Faisal, and David G Mayes. (2018). Financial Stability of Islamic Banking and the Global Financial Crisis, Evidence from the Gulf Cooperation Council. *Economic Systems* 42(2), 346–60.
- Anarfo, Ebenezer Bugri, and Joshua Yindenaba Abor. (2020). Financial Regulation and Financial Inclusion in Sub-Saharan Africa, Does Financial Stability Play a Moderating Role? *Research in International Business and Finance* 51, 101070.
- Aslam, Ejaz, and Razali Haron. (2020). Does Corporate Governance Affect the Performance of Islamic Banks? New Insight into Islamic Countries. *Corporate Governance, The International Journal of Business in Society* 20(6), 1073–90.
- Babar, Sadia, Rashid Latief, Sumaira Ashraf, and Sania Nawaz. (2019). Financial Stability Index for the Financial Sector of Pakistan. *Economies* 7(3), 81.
- Battiston, Stefano, and Serafin Martinez-Jaramillo. (2018). Financial Networks and Stress Testing, Challenges and New Research Avenues for Systemic Risk Analysis and Financial Stability Implications. *Journal of Financial Stability* 35, 6–16.
- Bouheni, Faten Ben, and Amir Hasnaoui. (2017). Cyclical Behavior of the Financial Stability of Eurozone Commercial Banks. *Economic Modelling* 67, 392–408.
- Dafermos, Yannis, Maria Nikolaidi, and Giorgos Galanis. (2018). Climate Change, Financial Stability and Monetary Policy. *Ecological Economics* 152, 219–34.
- Das, Ramesh Chandra. (2023). Issues of Non-Performing Assets, Security Investments Vis-à-Vis Credit, GDP and HDI. In *Growth and Developmental Aspects of Credit Allocation, An Inquiry for Leading Countries and the Indian States*, Emerald Publishing Limited, 41–58.
- Elsa, Elsa, Wiwik Utami, and Lucky Nugroho. (2018). A Comparison of Sharia Banks and Conventional Banks in Terms of Efficiency, Asset Quality and Stability in Indonesia for the Period 2008-2016. *International Journal of Commerce and Finance* 4(1), 134–49.
- Fouejieu, Armand, Alexandra Popescu, and Patrick Villieu. (2019). Trade-Offs between Macroeconomic and Financial Stability Objectives. *Economic Modelling* 81, 621–39.
- Guluma, Tolossa Fufa. (2021). The Impact of Corporate Governance Measures on Firm Performance, The Influences of Managerial Overconfidence. *Future Business Journal* 7(1), 1–18.
- Ijtsma, Pieter, Laura Spierdijk, and Sherrill Shaffer. (2017). The Concentration–Stability Controversy in Banking, New Evidence from the EU-25. *Journal of Financial Stability* 33, 273–84.
- Kadioglu, Eyup, and Nurcan Ocal. (2017). Effect of the Asset Quality on the Bank Profitability. *International Journal of Economics and Finance* 9(7), 60–68.
- Kamath, Bharathi. (2019). Impact of Corporate Governance Characteristics on Intellectual Capital Performance of Firms in India. *International Journal of Disclosure and Governance* 16, 20–36.
- Khalid, Asifa. (2020). Impact of Terrorism on The Economy of Pakistan. *Pakistan Vision* 21(1).
- Kim, Hakkon, Jonathan A Batten, and Doojin Ryu. (2020). Financial Crisis, Bank Diversification, and Financial Stability, OECD Countries. *International Review of Economics & Finance* 65, 94–104.
- Ma, Lina, Fengju Xu, Iqbal Najaf, and Akther Taslima. (2021). How Does Increased Private Ownership Affect Financial Leverage, Asset Quality and Profitability of Chinese SOEs? *Chinese Political Science Review* 6, 251–84.
- Muda, Iskandar, Weldi Maulana, Hasan Sakti Siregar, and Naleni Indra. (2018). The Analysis of Effects of Good Corporate Governance on Earnings Management in Indonesia with Panel Data Approach. *Iranian Economic Review* 22(2), 599–625.
- Nasreen, Samia, Sofia Anwar, and Ilhan Ozturk. (2017). Financial Stability, Energy Consumption and Environmental Quality, Evidence from South Asian Economies. *Renewable and sustainable energy reviews* 67, 1105–22.
- Neaime, Simon, and Isabelle Gaysset. (2018). Financial Inclusion and Stability in MENA, Evidence from Poverty and Inequality. *Finance Research Letters* 24, 230–37.
- Ngatno, Endang P Apriatni, and Arief Youlianto. (2021). Moderating Effects of Corporate Governance Mechanism on the Relation between Capital Structure and Firm Performance. *Cogent Business & Management* 8(1), 1866822.
- Noman, Abu Hanifa Md, Chan Sok Gee, and Che Ruhana Isa. (2017). Does Competition Improve Financial Stability of the

- Banking Sector in ASEAN Countries? An Empirical Analysis. *PloS one* 12(5), e0176546.
- Oduor, Jacob, Kethi Ngoka, and Maureen Odongo. (2017). Capital Requirement, Bank Competition and Stability in Africa. *Review of development finance* 7(1), 45–51.
- Okoye, Lawrence Uchenna et al. (2020). Effect of Corporate Governance on the Financial Performance of Commercial Banks in Nigeria. *Banks and Bank systems* 15(3), 55.
- Orazalin, Nurlan, Monowar Mahmood, and Timur Narbaev. (2019). The Impact of Sustainability Performance Indicators on Financial Stability, Evidence from the Russian Oil and Gas Industry. *Environmental Science and Pollution Research* 26, 8157–68.
- Phan, Dinh Hoang Bach, Bernard Njindan Iyke, Susan Sunila Sharma, and Yoga Affandi. (2021). Economic Policy Uncertainty and Financial Stability—Is There a Relation? *Economic Modelling* 94, 1018–29.
- Salike, Nimesh, and Biao Ao. (2018). Determinants of Bank’s Profitability, Role of Poor Asset Quality in Asia. *China Finance Review International* 8(2), 216–31.
- Sánchez Serrano, Antonio, and Tuomas Peltonen. (2020). Pension Schemes in the European Union, Challenges and Implications from Macroeconomic and Financial Stability Perspectives. *ESRB, Occasional Paper Series* (2020/17).
- Singh, Satwinder, Naeem Tabassum, Tamer K Darwish, and Georgios Batsakis. (2018). Corporate Governance and Tobin’s Q as a Measure of Organizational Performance. *British journal of management* 29(1), 171–90.
- Sironi, Andrea. (2018). The Evolution of Banking Regulation since the Financial Crisis, A Critical Assessment. *BAFFI CAREFIN Centre Research Paper* (2018–103).
- Sumantri, Muhammad Bayu Aji et al. (2021). The Effect Of Capital, Liquidity And Asset Quality On Profitability In Banking In Indonesia. *Review of International Geographical Education Online* 11(3), 1408–15.
- Suriawinata, Iman Sofian, and Tomas Augusto Correia. (2019). The Moderating Effect of Corporate Governance on the Relationship between Earnings Management and Firm Value, Indonesian Evidence. In *5th Annual International Conference on Accounting Research (AICAR 2018)*, Atlantis Press, 121–25.
- Tabak, Benjamin M, Dimas M Fazio, Karine C de O Paiva, and Daniel O Cajueiro. (2016). Financial Stability and Bank Supervision. *Finance Research Letters* 18, 322–27.
- Taib, Che Azlan, Muhammad Saleem Ashraf, and Mohd Shahril Bin Ahmad Razimi. (2018). Productivity Change in The Efficiency of The Insurance and Takaful Industry of Pakistan. 22(1).
- Wu, Chiu-Hui. (2021). On the Moderating Effects of Country Governance on the Relationships between Corporate Governance and Firm Performance. *Journal of Risk and Financial Management* 14(3), 140.
- Yang, Wei, and Shengdao Gan. (2019). Can Asset Quality Promote the Sustainable Development of Enterprises? In *2019 3rd International Conference on Economic Development and Education Management (ICEDEM 2019)*, Atlantis Press, 48–53.