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Determinants of the firm value of listed banks in Pakistan: A panel data approach

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ABSTRACT

The aim of this study is to examine the determinants of firm value for listed banks in Pakistan. This study is based on secondary data extracted from the annual reports of listed banks in Pakistan with quarterly data comprising 512 sample observations from 2015 to 2021. Panel data estimation techniques were employed for the analysis. The findings of the study revealed that all determinants influence firm value except liquid assets to total assets (LATA). The stock price of listed banks in Pakistan is continuously falling, which causes the stock's value to change from being overpriced to being undervalued. Nonperforming loans (NPLs) and the cost-to-income ratio (CIR) reduce firm value, while increases in the net interest margin (NIM) and capital adequacy ratio (CAR) enhance firm value. Further, NPLs and the CIR have a negative relationship with firm value. However, CAR, LATA, and NIM have positive associations with the firm value. The study concluded that the average capital adequacy ratio of listed banks in Pakistan is 10.5%, which is higher than the minimum requirement set by the regulator. This indicates that CAR helps to increase firm value in listed banks in Pakistan. The study will be useful to policymakers, regulators, and the banking sector in evaluating the major determinants that affect firm value.

Contribution/Originality: This study contributes to the existing literature on the firm value of listed banks in Pakistan by employing panel data estimation methodology. This study is one of the few that has investigated the determinants that affect the firm value of listed banks in Pakistan.

1. INTRODUCTION

In the past 15 years, firm value has grown in importance for both financial and non-financial businesses. The firms that actively participate in corporate governance prioritize firm value. The first step toward enhancing firm value is to maximize shareholder wealth. Financial firms are somewhat more cautious when determining firm value (Esan, Nwobu, Adeyanju, & Adeyemi, 2022). Financial institutions encountered numerous problems following the global financial crisis, which had a negative impact on share prices and worsened stock returns and market capitalization. This caused the financial sector to become more cautious (Latif, Mohd, & Kamardin, 2022).

A high degree of complexity can have an impact on banking performance, and the banking industry is developing very quickly. The dangers encountered by banks operating in Pakistan may increase due to the banking industry's high level of complexity. Monetary policy and subpar banking practices are two major factors that contribute to the problems of Pakistan's banking sector. Weak internal control and policies in the banking industry are a reflection of

this situation, e.g., a decline in interest rates, mismanagement of liquidity, excessive cost compared to revenue, morally deficient human resources, inadequate bank management, a depreciation of the Pakistani rupee, and a lack of rigorous oversight by the banks in Pakistan. The banking industry in Pakistan is negatively affected by this situation, which also causes a rise in NPLs and a drop in banks' capital (Farooq, Maqbool, Humanyun, Nawaz, & Abbas, 2015).

After the global financial crisis of 2007–2008, banks are more cautious when taking firm value into account because it can affect how investors consider the business. Firm value also considers future prospects and predictions for a firm's capacity to grow the value of its wealth (Chaudhary & Abbas, 2017). The banking industry in Pakistan is sophisticated and diversified, and is governed by the Central Bank of Pakistan (Jagirani, Zaidi, & Tahir, 2017). All banks in Pakistan are required to maintain a minimum capital level of 10% to handle any risk (Rafique, Quddoos, Akhtar, & Karim, 2020) and because a bank's capital is essential to attracting business.

The main factors contributing to bank failures all around the world are problems with loan quality. Therefore, bank assets that are of poor quality will turn into nonperforming loans (NPLs), which could affect firm value (Bouheni, Ammi, & Levy, 2016). Liquidity was also one of the major factors in the global financial crisis of 2007–2008. Liquidity arises when excessive funds from the banks are withdrawn. Therefore, it is difficult for banks to pay their short-term obligations. Hence, liquidity problems significantly affect firm value (Saleh & Abu, 2020). Increasing costs in the banking sector reduce revenue, while increasing net interest margins boosts profit.

The banking sector of Pakistan is facing numerous challenges, including problems with liquidity, asset quality in banks, as well as excessive costs and interest rates (Ishtiaq, 2015). The major objective of this study is to examine the determinants that affect firm value in listed banks in Pakistan by employing the latest dataset because the financial crisis had an impact on the market capitalization of firms in Pakistan, which could also affect firm value (Ali & Afzal, 2012). There are very few studies on the determinants of firm value in South Asia, including Pakistan. The study by Subanidja, Rajasa, Suharto, and Atmanto (2016) was on the drivers of firm value in financial firms, but their findings were not conclusive. Therefore, the focus of earlier studies was on other developing countries except Pakistan, which had inconclusive findings. This study is unique because it focuses exclusively on listed banks in Pakistan and uses the very latest dataset from 2015 to 2021. The next section of this study presents the literature review and the development of the hypotheses. Then, the methodology and a theoretical framework followed by empirical results are discussed. Finally, conclusions are presented.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Theoretical Review

Agency theory, institutional theory, stakeholder theory, stewardship theory, resource dependency theory, and many other theories support the key factors that significantly influence firm value. However, in this study, the agency theory will serve as a framework for understanding the key factors and how they affect firm value.

The agency theory demonstrates the relationship between an agent and a principle in which one person (the principal) employs another person (the agent) to perform services on their behalf due to the separation of ownership and control (Jensen & Meckling, 1976). Information asymmetry could make the financial system's agency issues more obvious. Asymmetric knowledge can lead to disputes concerning agency between the debtor and the creditor. The agency hypothesis holds that debtors have control over their money from creditors so that they can manage it and safeguard their creditors' interests (Keown, Martin, Petty, & Scott, 2007).

The agency theory also advocates that managers get more funds from shareholders due to their tendency to take higher risks. This means that when these funds are not carefully used, it affects shareholders' wealth maximization, which could affect firm value and may lead to agency problems between managers and shareholders (Ishtiaq, 2015).

2.2. Review of Empirical Studies

The following section is a detailed review of empirical investigations.

2.2.1. Firm Value in the Banking Sector

The banking sector serves as an intermediary institution, obtaining funds from parties with excess funds and distributing them in the form of credit to those who need it. By monitoring and carefully choosing depositors and borrowers, the banking sector can avoid moral hazard issues and adverse selection (Berger, Demirguc-Kunt, Levine, & Haubrich, 2004). Firm value is important to increase the wealth of shareholders (Kim, Henderson Jr, & Garrison, 1993). The market price of a share is a key factor in determining a firm's value because an increase in the share price will also increase the firm's worth, which could lead to increased shareholder wealth (Endri & Fathony, 2020). Investors utilize financial ratios to determine a firm's market worth. This ratio allows management to understand how investors evaluate the firm's historical performance and potential in the future. Tobin's Q is one of the ratios used to calculate the firm's market value.

2.2.2. Capital Adequacy Ratio and Firm Value

Capital is essential because it provides funds for banks to attract business. It is also crucial since it enhances a firm's value by protecting against the possibility of bank failure and absorbing financial losses (Mishkin, 1999). The bank's ability to meet its obligations is demonstrated by the proper capital in relation to its assets. After the global, regional, and banking crises in many countries over the past 20 years, regulators have advised banks to maintain minimum capital requirements to withstand unforeseen losses from the excessive risks taken by the banks. The capital adequacy ratio (CAR) is an essential measure to promote the stability and efficiency of financial systems around the globe. According to Chioma, Okoye, Chidume, and Nnenna (2021), there is a positive association between the capital adequacy ratio and firm value.

H_1: Capital adequacy ratio increases firm value.

2.2.3. Nonperforming Loans and Firm Value

A loan becomes nonperforming when the borrower defaults and does not make payments on time as per the payment schedule agreed by both the bank and the borrower. The higher nonperforming loans (NPLs) are a default risk for the banks and can result in the deterioration of firm value. In their study evaluating firm value and NPLs, Olalere, Islam, Junoh, Yusoff, and Iqbal (2020) found that NPLs affect firm value. Asset quality is crucial in the banking sector, as it ensures that loans provided to borrowers are safe and will be repaid on time, along with a markup. According to Perera and Morawakage (2017), NPLs significantly affect firm value. NPLs cause losses for banks, which lowers their profitability. Banks must therefore make provisions. This implies that firms must set aside funds to cover anticipated losses. Dauda and Nyor (2018) also found that higher NPLs reduce firm value.

H_2: Nonperforming loans affect firm value.

2.2.4. Cost-to-Income Ratio and Firm Value

The cost-to-income ratio (CIR) is an essential financial indicator that is primarily employed when appraising banks. This ratio provides a clear picture of the bank's operational efficiency. The CIR and firm value have an inverse relationship (Olalere et al., 2020). Situmorang and Augustine (2019) found a negative relationship between CIR and firm value. They also mentioned that a higher CIR indicates that a bank generates lower revenue and higher costs. Similarly, a lower CIR reveals that a bank earns more revenue compared to its costs. The CIR is also crucial to compare ratios across the industry.

H_3: The cost-to-income ratio has an impact on firm value.

2.2.5. Liquid Assets to Total Assets and Firm Value

When a bank encounters sudden variations in cash outflows in the form of substantial deposit withdrawals, it may experience liquidity problems. Therefore, liquidity is crucial for banks globally. Increased liquidity problems

could also result in increased market, credit, and liquidity risks. Liquidity problems were one of the major causes of the global financial crisis in 2007–2008 because the banks relied on the short-term money market to finance their assets (Chen, Shen, Kao, & Yeh, 2018). Banks are extremely important to the global financial system, and without proper safety margins, banks may create a risk for the financial system and the economy. Therefore, liquidity problems affect firm value (Ebenezer, Islam, Yusoff, & Rahman, 2019). Du, Wu, and Liang (2016) argued that liquidity problems are a threat to the overall banking sector becoming insolvent, which could affect firm value and can have a reputational loss. Olalere et al. (2020) found a negative relationship between liquidity and firm value and that liquidity problems have a significant impact on firm value.

H_4: The ratio of liquid assets to total assets has an impact on firm value.

2.2.6. Net Interest Margin and Firm Value

Net interest margin (NIM) is a crucial indicator of a bank's profitability and growth. It shows the difference in interest rates between the bank's interest on deposits and its interest on loans (Busch & Memmel, 2015). When analyzing their investment choices, financial institutions such as banks and creditors frequently use NIM as a tool. This enables them to efficiently and profitably manage their loan activity. Olalere et al. (2020) found that NIM affects firm value. Ebenezer et al. (2019) argued that there is a positive relationship between NIM and firm value. Therefore, NIM affects firm value.

H_5: Net interest margin increases firm value.

3. EMPIRICAL METHODOLOGY AND THEORETICAL FRAMEWORK

3.1. Sample Selection

This study aims to quantify the key factors that affect the firm value of listed banks in Pakistan. More than 31 banks, including conventional, Islamic, public, private, and international banks, are currently operating in Pakistan. Due to the dominance of the banking sector in Pakistan's financial system, this study only considered the listed banks. In comparison to Pakistan's banks, other financial institutions, including leasing firms, mutual funds, and insurance companies, have a less substantial impact on the country's financial system (Khan, 2007). Therefore, this study is based on a sample selection of banks listed on the Pakistan Stock Exchange (PSX). To conduct this study, this research considered 18 listed banks in Pakistan as of December 2021 with quarterly data.

Table 1. Population and sample size.

Population & sample	2015	2016	2017	2018	2019	2020	2021
Total banks in Pakistan	31	30	29	29	29	29	29
Total listed banks in Pakistan	19	19	18	18	18	18	18

This study covers the period from 2015 to 2021 with 512 observations (see Table 1 and Table 2). The reason for considering this particular period is to target the latest dataset.

Table 2. Quarterly observations of listed banks in Pakistan.

Year	Year-wise total listed banks	Quarterly observations
2015	19	76
2016	19	76
2017	18	72
2018	18	72
2019	18	72
2020	18	72
2021	18	72
Total observations	512	

3.2. Research Framework

The logical relationship between dependent and independent variables is shown in Figure 1.

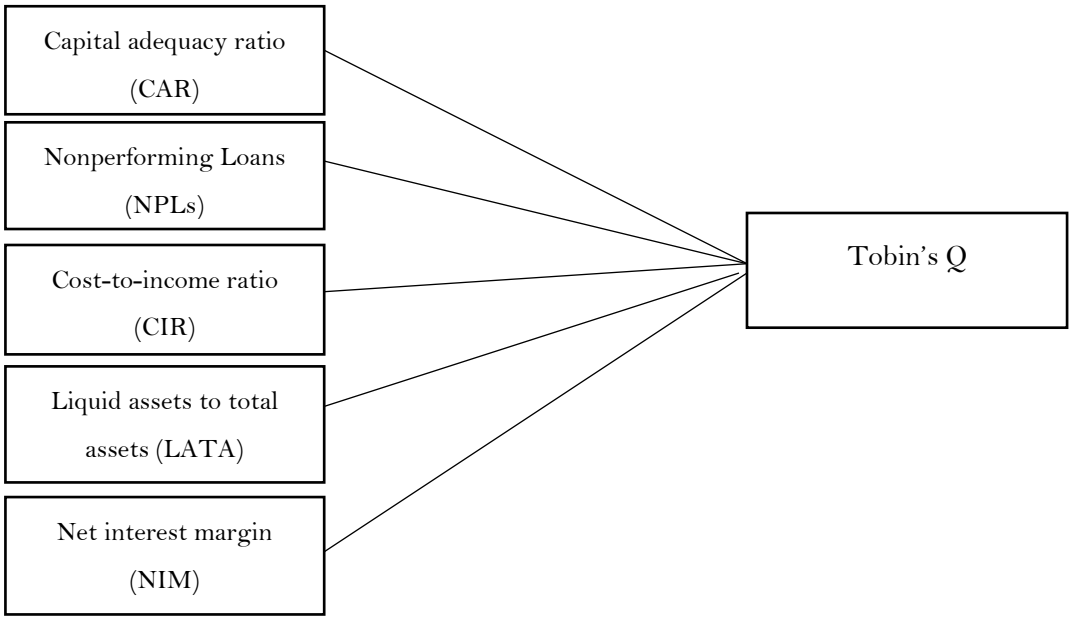

Figure 1. Relationship between variables.

3.3. Variables and their Measurements

Table 3 lists the variables used in the study along with their measurements.

Table 3. Summary of variables and their measurements.

Variable	Code	Measurements	Sources
Tobin's Q	Tobin's Q	Market value of equity + book value of debt/book value of total assets	Isidro and Sobral (2015)
Capital adequacy ratio	CAR	Total capital / Risk weighted assets: Risk weighted assets = credit risk weighted assets	Laeven and Levine (2009)
Nonperforming loans	NPL	Total NPLs/Total loans outstanding	Perera and Morawakage (2017); Olalere et al. (2020)
Liquid assets to total assets	LATA	Liquid assets/Total assets	Ebenezer et al. (2019); Olalere et al. (2020)
Cost-to-income ratio	CIR	Operating cost/Operating income	Olalere et al. (2020)
Net interest margin	NIM	Net interest income/Average interest earning assets	Ebenezer et al. (2019); Olalere et al. (2020)

3.4. Model Specification

This study employs unbalanced panel data methods. Panel data has both longitudinal and cross-sectional attributes that observe firm value responses over time. Therefore, to formulate the hypotheses of this study, the following econometric equations are developed:

$$FM_{i,t} = \beta_0 + \beta_1 CAR_{i,t} + \beta_2 NPL_{i,t} + \beta_3 LATA_{i,t} + \beta_4 CIR_{i,t} + \beta_5 NIM_{i,t} + e_{i,t} \quad (1)$$

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 CAR_{i,t} + \beta_2 NPL_{i,t} + \beta_3 LATA_{i,t} + \beta_4 CIR_{i,t} + \beta_5 NIM_{i,t} + e_{i,t} \quad (2)$$

Where:

FM = Firm value.

CAR = Capital adequacy ratio.

NPL = Non-performing loan.

LATA = Liquid assets to total assets.

CIR = Cost-to-income ratio.

NIM = Net interest margin.

Ɛ = Error term.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Table 4 reveals the descriptive statistics of this study.

Table 4. Descriptive statistics.

Variable	Tobin's Q	CAR	NPL	LATA	CIR	NIM
Mean	0.214	10.6	9.89	0.882	43.02	0.994
Median	0.928	9.93	8.92	0.745	34.9	0.915
Maximum	21.3	19.2	11.5	0.923	52.5	1.02
Minimum	0.200	9.53	0.925	0.015	0.134	0.882
Std. dev.	1.95	2.45	0.264	0.316	0.421	0.361

Table 4 contains the descriptive statistics for the dependent and independent variables, where Tobin's Q is the dependent variable, and CAR, NPL, LATA, CIR, and NIM are the independent variables. The lower mean of Tobin's Q, 0.2145, indicates that listed banks in Pakistan are undervalued. It shows that listed banks' Tobin's Q values are constantly falling, which causes the stock's value to change from being overpriced to being undervalued. The mean value of CAR is 10.5671, i.e., the average CAR of listed banks in Pakistan is 10.5%, which is higher than the minimum requirement recommended by the regulator. The average NPL ratio of listed banks in Pakistan is 9.8%, which suggests that a higher NPL ratio could put banks at risk of lower profitability. The mean value of LATA is 0.8826, indicating that listed banks in Pakistan have about 88% of easily convertible liquid assets. In other words, banks in Pakistan are strong enough to fulfil their short-term obligations. CIR has the highest mean of 43.0245, which indicates that listed banks in Pakistan make less revenue compared to their expenses, which may be because of insufficient systemic supervision or weak internal controls. The lower mean of NIM (0.9945) indicates that investment returns are insufficient to offset interest costs. Therefore, listed banks in Pakistan need to effectively use their assets.

4.2. Goodness of Fit Test and Calculation of Firm Value

Table 5 shows the results of the goodness of fit test, which is commonly known as model fitness. The regression model explained 77% of the variability observed in the targeted variable, resulting in an R-squared of 0.774. Further, 77% of the results of R-squared indicate that the data is fit for the regression model.

Table 5. Goodness of fit test.

Model	R	R-squared	Adjusted R-squared	Std. error of the estimate
1	0.880[a]	0.774	0.566	78.159

Note: a. Dependent variable: Tobin's Q; P < 0.05.

Table 6. Coefficients.

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. error	Beta		
1	(Constant)	1.95	0.083		27.1	0.000
	CAR	1.86	0.000	1.23	17.3	0.000
	NPL	-0.613	0.445	-0.319	-1.68	0.000
	LATA	0.435	0.132	0.214	2.78	0.224
	CIR	-0.769	0.226	-0.298	-1.39	0.020
	NIM	0.889	0.298	0.789	0.678	0.010

Note: a. Dependent variable: Tobin's Q; P < 0.05.

Table 6 reveals that the coefficient establishes how closely the dependent and independent variables are related to each other. The results indicate both positive and negative relationships between the dependent and independent variables. The results for four out of the five independent variables are statistically significant. However, LATA is statistically insignificant. This means that CAR, NPL, CIR, and NIM affect firm value in listed banks in Pakistan.

4.3. Pearson's Correlation

The relationships between the independent and dependent variables were determined using Pearson's correlation, and the results are shown in Table 7.

Table 7. Pearson's correlation.

Variable	Tobin's Q	CAR	NPL	LATA	CIR	NIM
Tobin's Q	1					
CAR	0.571*	1				
NPL	-0.621	-0.427**	1			
LATA	0.594*	0.604***	-0.195*	1		
CIR	-0.657	-0.338	0.431	0.194*	1	
NIM	0.725	0.478	0.229***	0.377	-0.315***	1

Note: * P < 0.05, ** P < 0.01, *** P < 0.001.

Table 7 shows a positive relationship between CAR and Tobin's Q. It also implies that the capital adequacy ratio raises the firm value of listed banks in Pakistan. Nonperforming loans have a negative association with Tobin's Q and CAR, but the degree of association with CAR is weak. This means that NPLs in listed banks decrease both capital adequacy and firm value. Correspondingly, LATA has a positive relationship with Tobin's Q and CAR and a weak and negative association with NPLs, which means that LATA in listed banks of Pakistan increases firm value and capital adequacy. The cost-to-income ratio reveals a negative relationship with Tobin's Q and a weak negative relationship with CAR. However, CIR shows a positive relationship with NPLs, which means that increased costs in listed banks decrease firm value and capital adequacy but increase NPLs. Lastly, NIM has a positive relationship with Tobin's Q and CAR; however, it reveals a weak positive relationship with NPLs and LATA and a weak negative association with CIR.

4.4. Hausman Test

Table 8 reveals the results of the ordinary least squares (OLS) and fixed and random effects.

Table 8. Quality of firms' value determinants.

Variable	(1) Ordinary least squares (OLS)	(2) Fixed effects	(3) Random effects
CAR	0.847*** (0.367)	0.714** (0.000)	0.865*** (0.367)
NPL	-0.079 (0.323)	-0.728** (0.000)	-0.069 (0.323)
LATA	0.432 (0.236)	0.227** (0.247)	0.263 (0.214)
CIR	-3.043*** (0.745)	-2.876** (0.022)	-2.033*** (0.784)
NIM	3.873* (1.579)	4.019** (0.014)	2.287* (1.449)
C	26.76*** (7.477)	28.88*** (7.561)	29.75*** (6.459)
Observations	512	512	512
R-squared	0.42	0.45	0.47
F-test	7.743	8.934	11.562
Prob > F	0.00785	0.00564	0.00897
Hausman test	--	--	0.31
Prob.	--	0.001**	--

Note: *P < 0.05, ** P < 0.01, *** P < 0.001.

The Hausman test is used to select the best model between the fixed effects and random effects. For this test, the null hypothesis states that the random effects model is suitable, and the alternative hypothesis states that the fixed effects model is appropriate (Torres-Reyna, 2007). We reject the null hypothesis if the p-values are statistically significant; otherwise, we accept the null hypothesis. The impact of key determinants on firm value is shown in Table 8, and the probability value of 0.001 supports the use of a fixed effects model in this case.

The R-squared (45%) and F-statistic values reflect model fitness. Further, the results also indicate that determinants, such as CAR, NPL, CIR, and NIM, significantly influence firm value, whereas LATA does not.

4.5. Summary of Hypothesis Testing Results

Table 9 presents the results of the hypotheses testing.

Table 9. Hypothesis testing results.

Hypothesis	Tobin's Q
H_1: Capital adequacy ratio increases firm value.	Hypothesis supported
H_2: Nonperforming loans affect firm value.	Hypothesis supported
H_3: The cost-to-income ratio has an impact on firm value.	Hypothesis supported
H_4: The ratio of liquid assets to total assets has an impact on firm value.	Hypothesis not supported
H_5: The net interest margin increases firm value.	Hypothesis supported

5. CONCLUSION

The global financial crisis of 2007–2008 brought about several other crises, including a lack of liquidity, an increase in NPLs, poor capital management, excessive costs, and decreased revenue. Following these crises, banks have become more cautious due to the possibility of firm value problems (Liu, Uchida, & Yang, 2012). The question is whether major determinants such as CAR, NPL, LATA, CIR, and NIM affect firm value. Therefore, this study investigated the effect of major determinants on the firm value of listed banks in Pakistan and concluded that CAR, NPL, CIR, and NIM affect firm value. Conversely, LATA does not affect firm value.

The study also concluded that listed banks in Pakistan are undervalued. This means that the stock price is continuously falling, which causes the stock's value to change from being overpriced to being undervalued. The average capital adequacy ratio of listed banks in Pakistan is 10.5%, which is higher than the minimum requirement set by the regulator, meaning that CAR helps to increase the firm value of listed banks in Pakistan. The study also concluded that NPLs and CIR reduce firm value and that increases in NIM and CAR enhance firm value. Finally, the study concluded that NPL and CIR have a negative relationship with firm value. However, CAR, LATA, and NIM have positive associations with the firm value of listed banks in Pakistan.

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