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Do Non-Performing Loans Deteriorate the Sustainability of the Banking Sector?

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ABSTRACT

This paper seeks to investigate the enduring influence on Non-Performing Loans (NPLs) due to bank-specific and macroeconomic factors along with governance structure within the Pakistani banking sector context during 2011 to 2023. Utilizing OLS and Quantile Regression Models, distinct analyses were conducted for Islamic banks, private banks, and public banks in Pakistan separately. The empirical results indicate that a significant portion of variations in NPL can be elucidated by bank-specific and macroeconomic variables. Study shows that different bank specific and macroeconomic variables have different impacts on NPL of Islamic, Public & private banks. Islamic banks are less sensitive as compared to private and public banking systems to variability in their NPLs. This unlocks the door for policy makers and practitioners to foresee the future of banking transactions especially the Islamic banks where the ratio of NPLs is minimum.

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1. Background

The stability of any country's economy relies heavily on the banking sector. However, this sector encounters various risks that not only jeopardize its financial health but also pose a threat to the stability of the entire nation (Naili and Younes, 2021). Improper management of risky lending and financial investments by banks can lead to a surge in non-performing loans - NPL (Kumar et al., 2018).

Financial institutions, especially commercial banks provide advances to corporate sector and household consumers, expecting repayment of the principal amount alongwith interest. However, if the borrower defaults on the debt, the bank faces credit risk, often manifested as Non-Performing Loans (NPLs). NPLs serve as crucial indicators of credit risk, significantly influencing the quality of bank credit. The deterioration in credit quality is a primary driver of financial instability. Moreover, the level of NPLs impacts bank efficiency, consequently affecting overall financial stability (Foglia, 2022).

As per the definitions provided by the European Central Bank and IMF, Non-Performing Loans (NPLs) refer to loans that remain outstanding for more than 90 days with debtors unable to fulfill their credit obligations entirely. NPLs have adverse effects on banks, hindering their ability to issue new loans. Additionally, companies with strong creditworthiness tend to borrow more from banks (Febo and Eliana, 2022).

Following the financial crises of 2007-2008, the global economy experienced a significant downturn, leading to a sharp deterioration in banks' asset quality. Consequently, Non-Performing Loans (NPLs) have become a key indicator of credit quality. Given the negative correlation between NPLs and economic outcomes, researchers often refer to NPLs as a form of financial pollution. Studies have identified the accumulation of NPLs as a fundamental cause of banking crises. Minimizing NPLs is crucial for establishing a robust banking system and fostering financial stability (Ahmed et al., 2021).'

Performing loans transitioning into Non-Performing Loans (NPLs) typically stem from heightened default probabilities. Factors such as increased unemployment risks and borrowers with lower incomes tend to elevate default rates. The global financial crisis was largely attributed to the proliferation of NPLs, which not only adversely affected financial statement reporting but also exposed banks to elevate credit risks. Additionally, the macroeconomic landscape of a nation plays a significant role in this transition from performing to non-performing loans. Consequently, NPLs have become a focal point in literature, prompting extensive examination (Ghosh, 2017).

A higher proportion of non-performing loans (NPLs) suggests potential financial distress, leading to more regulatory oversight and reputational risk. This might exacerbate the bank's inefficiencies and constrain its competitive potential. (Katuka et al., 2023).

In the microfinance sector, the rate of non-performing loans tends to be lower compared to traditional banking. This is primarily facilitated by microfinance institutions charging higher interest rates to cover operational expenses. As per the relationship banking theory, there exists a negative correlation between operating costs and NPLs. This is because the allocation of resources towards building client relationships increases operational costs while simultaneously enhancing repayment rates. Numerous studies within the banking industry have also demonstrated a positive correlation between these variables (Zamore, Leif, and Roy, 2017).

Shehzad, Jakob, and Bert (2009) indicate that concentrated ownership influences the risk profile of banks. Conversely, dispersed ownership diminishes the power of shareholders. Some scholars contend that ownership concentration strengthens corporate control. Moreover, it has been demonstrated that large shareholders often have divergent interests compared to minority shareholders. Strong boards tend to augment a bank's risk appetite. Consequently, concentrated ownership is associated with a reduction in non-performing loans.

Non-performing loans serve as indicators of weaknesses within the financial system, often used to assess its vulnerability. Following the global crisis, there has been a notable increase in non-performing loans, posing risks to banking system liquidity, profitability, and overall financial stability (Us, 2016).

Banks collapse mostly because of two issues. First, their loan portfolios include Non-Performing Loans (NPLs), and second, they have poor cost efficiency. One theory is that bad management is a major cause of bank failures. According to the "bad luck" concept, NPLs have a negative impact on cost efficiency since economic downturns cause banks to incur higher expenses, diminishing efficiency. On the other side, the "bad management" theory implies that cost efficiency effects NPLs, since insufficient monitoring of loan portfolios by managers might result in greater NPL rates (Podpiera and Laurent, 2008).

Research indicates that bank-specific factors serve as early indicators for non-performing loans when both microeconomic and macroeconomic variables are considered together. Many times, the NPL ratio is seen as a key sign of credit risk and bank soundness. (Ozili, 2022). NPL are significantly influenced by macroeconomic conditions. In the Chinese banking system, managerial efforts to mitigate non-performing loans are positively impacted by incentive controls. Disposable income, unemployment rates, and monetary conditions exert a substantial influence on the occurrence of non-performing loans (Berger and DeYoung, 1997). Louzis, Angelos, and Vasilios (2011) have investigated various hypotheses including bad management, bad luck, moral hazard and skimping, and concluded that low cost efficiency resultant in increase in future problematic loans.

The banking sectors of Emerging Asian countries grapple with ongoing challenges, particularly regarding Non-Performing Loans (NPLs). The real business-cycle (RBC) theory, introduced by King and Plosser (1984), initially identified the link between macroeconomic variables and NPLs. However, various studies have revealed diverse relationships among macroeconomic variables and NPLs, with some indicating procyclical patterns and others countercyclical ones (Arham et al., 2020). Financial organizations use NPLs as performance measures, with research indicating a negative association between the NPL ratio and banks' economic success (Lafuente, Yancy, and Ferran, 2019).

Tunisian banking experienced significant disruption following the revolution, characterized by heightened risk and decreased liquidity. Moreover, the purchasing power suffered a decline owing to rising inflation, resulting in stock index losses and a 15 percent acceleration in the debt ratio. Focused on profitability, banks raised interest margins, rendering borrowers unable to fulfill their debts, thus leading to NPLs (Kumar et al., 2018).

1.1. Problem Statement:

Over the past decade, banks in both industrialized and developing nations have experienced a consistent rise in non-performing loans (NPLs) as a result of bank specific variables and macroeconomic indicators. Based on the survey of previous papers, this study takes this opportunity to fill the gap of overlapping empirical findings of NPLs with several independent variables. As the study is related to the emerging market of Pakistan, the results help practitioners and academicians to generalize them to the extent of emerging markets.

1.2. Objective of the Study:

The current study aims to examine the cause and effect and long run relationship among macroeconomic factors, ownership structure, bank specific factors with non-performing loans in the context of Pakistan's banking sector. There are in total 25 banks, 15 are private banks, 5 are public sector banks and 5 are Islamic banks which are included in the sample of the paper. We take non-performing loans (NPLs) as dependent variable. List of independent variables alonghwith their measurement is given in table 1. We employed OLS as well as Quantile regression model to compare the empirical findings among different econometric models.

Figure 1 and figure 2 figure 3 show the fluctuations of NPL in Islamic Banks, public sector banks and private banks respectively during the time period of 2011-2023. The bank faced some crucial time when NPL went on peak but improved the situation in later year. these figures show a common decreasing trend of NPL in all banks except the Sindh Bank. It is possible that due to small in size, the bank failed to improve its NPL level at par with other banks.

Table 1. Operational Definitions of the Constructs

CONSTRUCTS	EXPLANATION	ABBREVIATION	EXPECTED SIGN	REFERENCE
Bank Specific Factors				
Credit growth	"Loans-to-assets ratio"	Cg	+	(Ahmed et. al., 2021)
Loan Loss Provision	"Ratio of loan loss provision provided	Llp	+	(Ahmed et. al., 2021)

	by bank in its financial statement"			
Bank Diversification	"Ratio of non-interest income to total income"	Bd	+	(Ahmed et. al., 2021)
Bank Operating efficiency	"Ratio of non-interest expenses to total assets"	Boe	-	(Ahmed et. al., 2021)
Bank size	"Natural log of total assets"	Bs	-	(Naili and Younes, 2022)
Bank Profitability (Return on assets)	"Ratio of net pre-tax income to total assets"	roa	-	(Ahmed et. al., 2021)
Net interest margin	"Difference between lending and borrowing rate"	nim	+	(Ahmed et. al., 2021)
Ownership Structure				
Government ownership	"Ratio of government ownership"	go	+	(Ahmed et. al., 2021)
Family ownership	"Ratio of family ownership"	fo	-	(Ahmed et. al., 2021)
Macroeconomic factors				(Ahmed et. al., 2021)
Interest rate	"Country policy rate specify by the State Bank of Pakistan"	ir	+	(Ahmed et. al., 2021)
Exchange rate	"Real exchange rate in dollars provided obtained from IMF website"	er	+	(Ahmed et. al., 2021)
GDP growth rate	"GDP growth rate obtained from IMF website"	gr	-	(Ahmed et. al., 2021)
Unemployment	"Percentage (%) of unemployment in year t"	un	+	(Naili and Younes, 2022)
Public debt	"Gross government debt as % of GDP"	pd	-	(Naili and Younes, 2022)
Credit to the private sector	"When bank give loan to the private sector as a % of GDP."	cps	+	(Naili and Younes, 2022)

Figure 1 – NPL of Islamic Banks

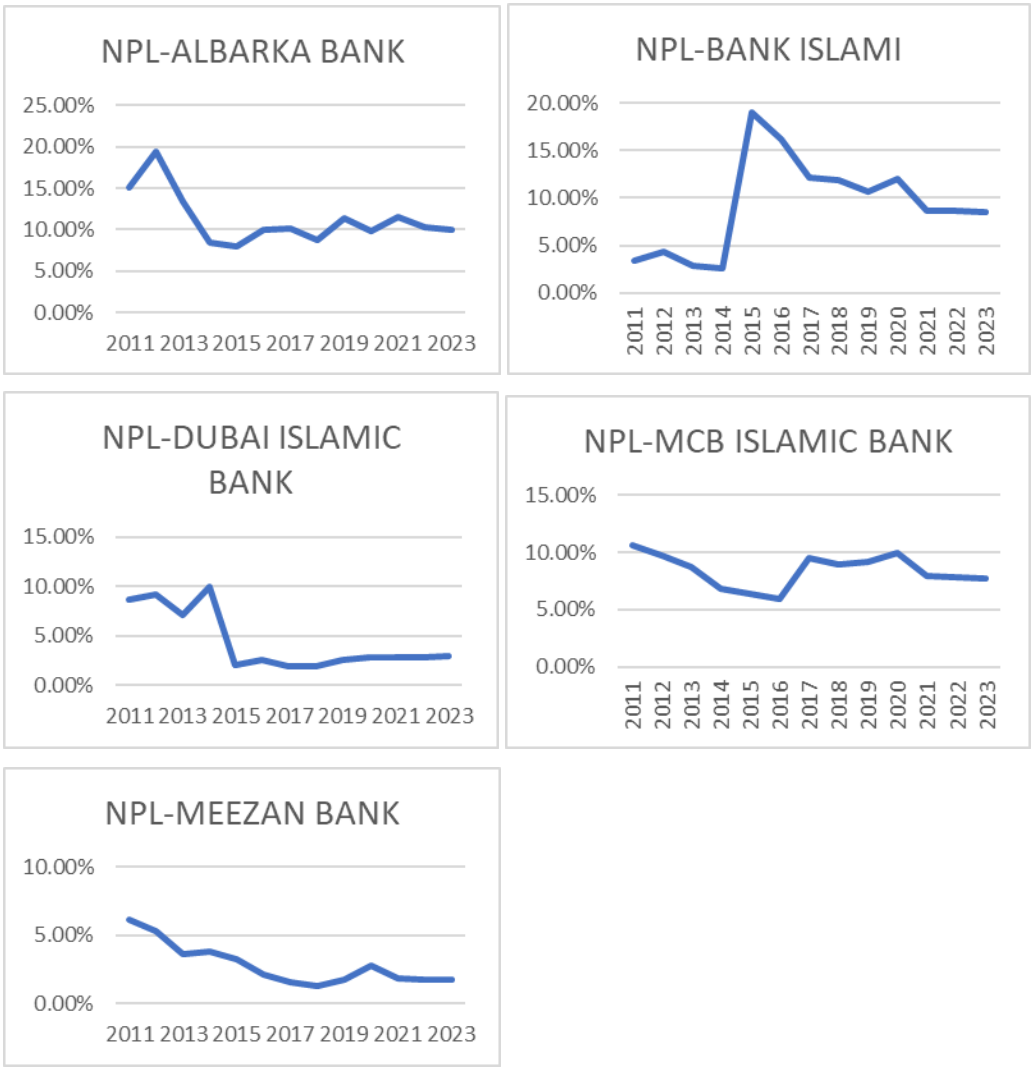
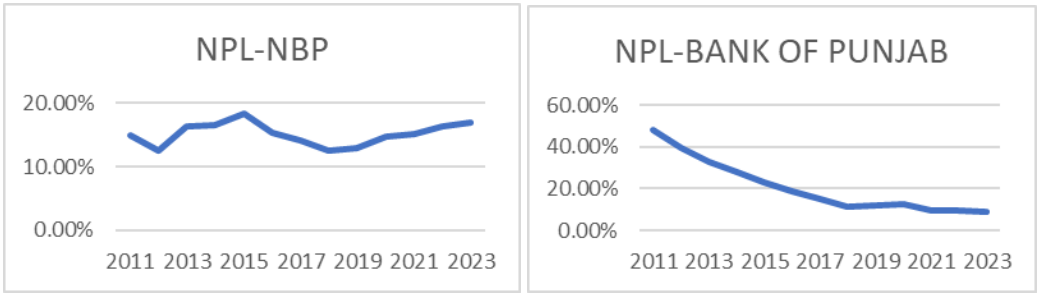


Figure 2 – NPL of Public Banks



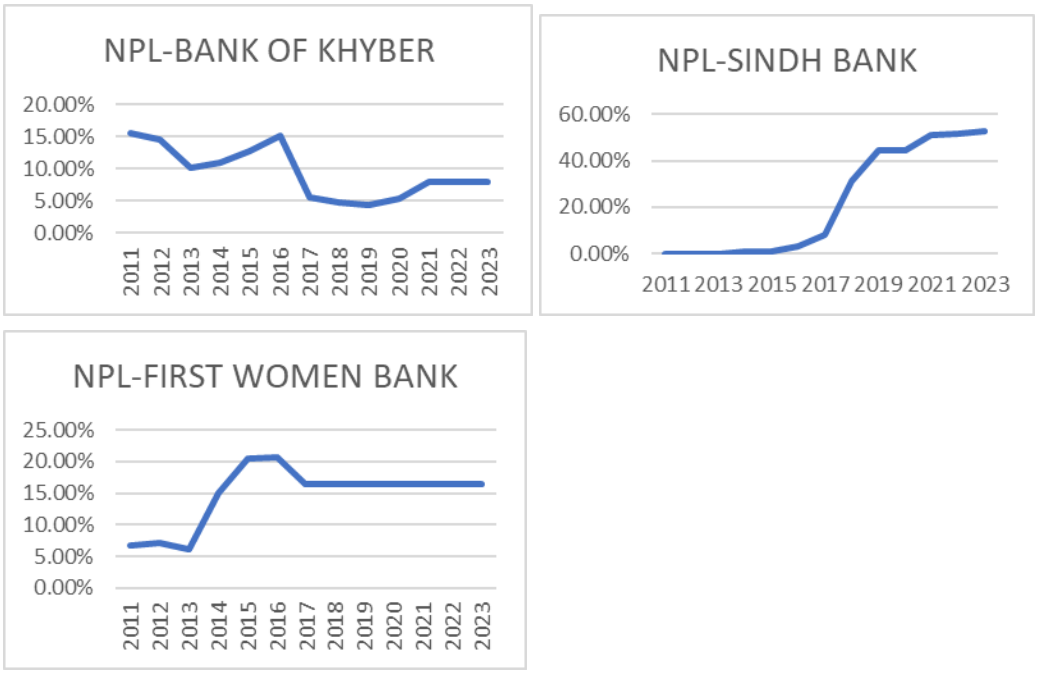
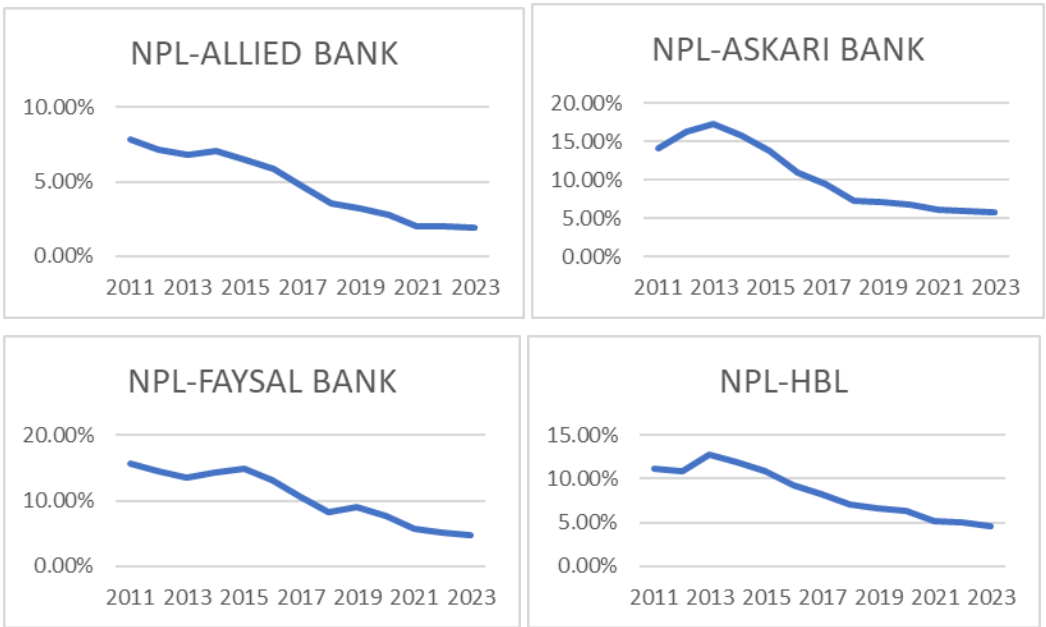
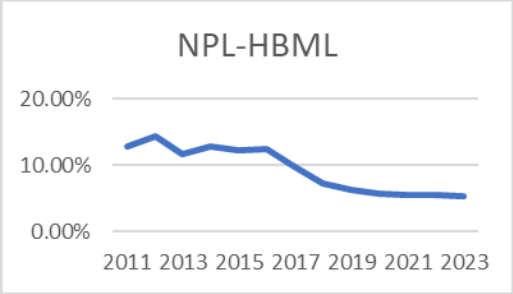
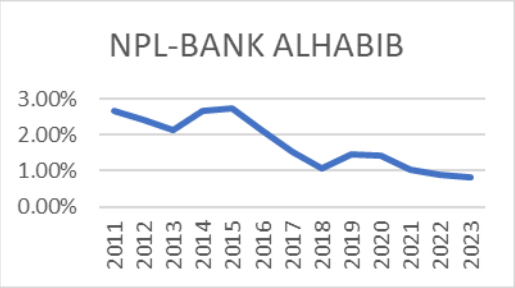
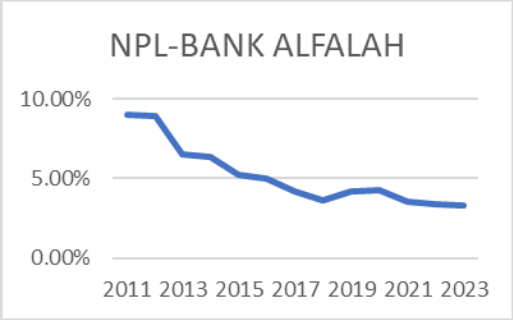


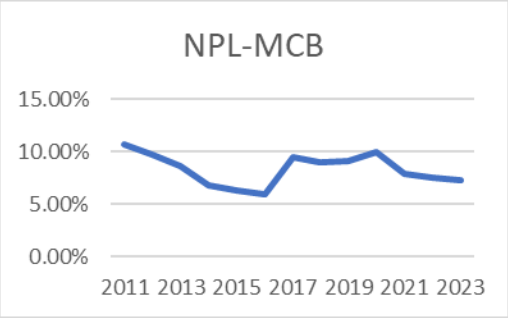
Figure 3 – NPL of Private Banks

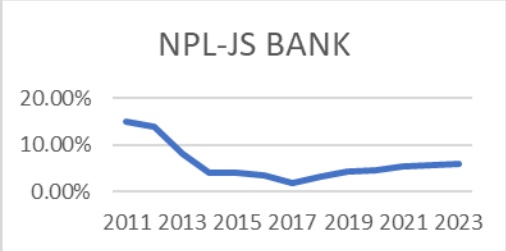


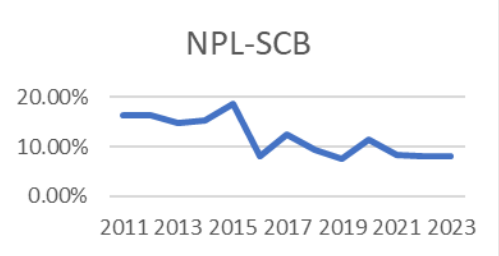


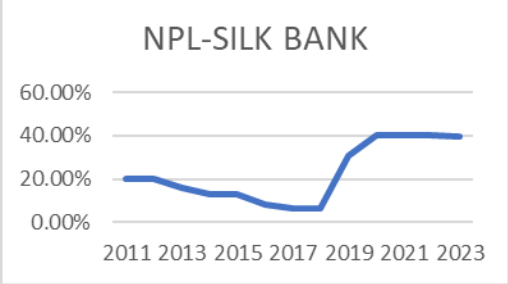


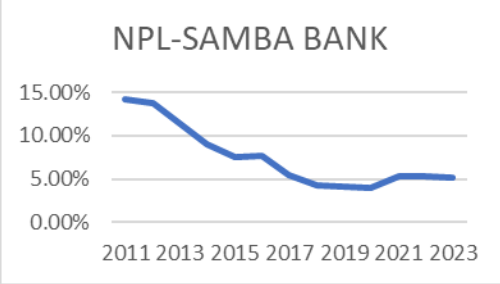


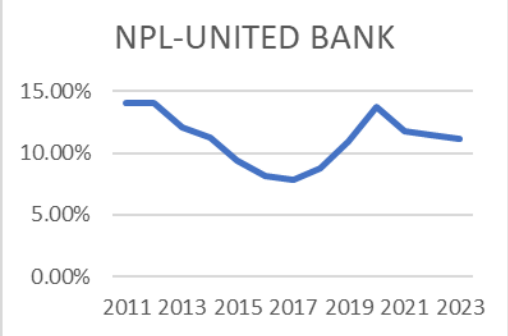


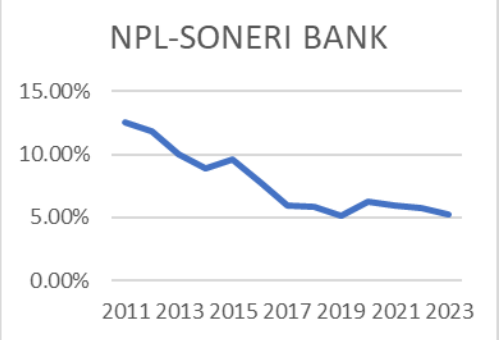


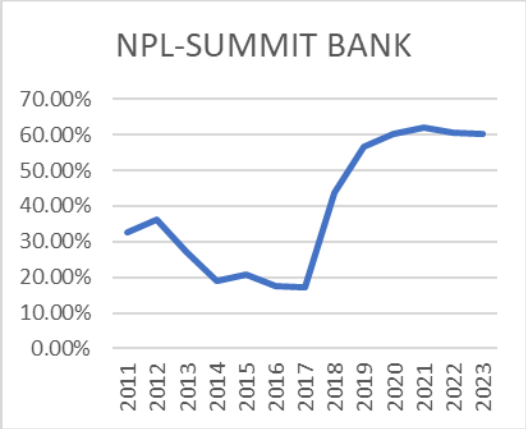












2. Literature Review

Foglia (2022) investigated the correlation between Non-Performing Loans (NPLs) and macroeconomic factors in the Italian banking system. Covering the period from 2008Q3 to 2020Q4, the author implemented an Autoregressive Distributed Lag (ARDL) cointegration model. Data from Italian institutions, which included up to 50 observations, was obtained from sources such as OECD, CEIC, Eurostat and ECB.

The main variables affecting Non-Performing Loans (NPLs) in developing economies are examined by Naili and Younes (2022). NPLs are the dependent variable in this research, while the independent variables are macroeconomic and bank-specific factors. The authors use the Generalized Method of Moments (GMM) model to examine these variables. Annual data from BankScope and Thomson Reuters covers 53 banks in the MENA area, which includes Morocco, Tunisia, Egypt, Jordan, and Turkey. The data spans from 2000 to 2019.

Arham et al. (2020) conducted a study investigating the influence of the macroeconomic cycle and country governance on bank Non-Performing Loans (NPLs). The authors scrutinized the relationship between variables by employing the panel regression analysis methods. In order to test the hypothesis, employed the pooled ordinary least squares (POLS) on the data from 2007 to 2017. The macroeconomic variables were taken as independent variables whereas bank NPLs was the dependent variable. Empirical findings revealed a positive impact of the unemployment rate and inflation on NPLs, while total external debt/GDP and inflation rate exhibited a negative impact. Interaction analysis suggested that the NPL risks are mitigated by the good governance procedures.

Ebo and Eliana (2022) looked at how macroeconomic factors affected China's Non-Performing Loans (NPLs). 57 quarterly observations, covering the period from 2008Q1 to 2021Q1 were used in the research. The short- and long-term causal links and linkages between these variables were investigated using wavelet analysis. The OECD and the World Bank provided the data. The EPU index, GDP, and inflation were the independent variables, while non-performing loans (NPLs) were the dependent variable.

Dan-Costin, Dedu and Maria (2021) conducted an analysis of the European Union banking system, examining the influence of social, governance, and macroeconomic variables. The study utilized annual data sourced from the World Bank website, covering 27 EU member states over the period from 2005 to 2018. Panel regression was employed, revealing that an increase in banking development led to higher levels of private sector activity and a decrease in Non-Performing Loan (NPL) rates. Social factors such as social inequality, legal rights strength, and bureaucracy were found to correlate with private sector lending levels, while NPL rates were influenced by social inequality and bureaucracy. Governance factors, including regulatory system quality and governance efficiency, impacted both the share of private lending in GDP and NPL rates. Additionally, selected macroeconomic indicators were found to influence private sector lending levels, with unemployment and inflation affecting NPL rates.

Ahmed et al. (2021) conducted an examination into the correlation between bank-specific and macroeconomic factors with Non-Performing Loans (NPLs). Employing the Generalized Method of Moments (GMM) estimator, the authors ensured the reliability of the model by assessing instrument validity through J tests and Arellano-Bond AR (2) tests. Data spanning from 2006 to 2018 was collected from 20 banks in Pakistan, primarily comprising private sector banks with a few public sector banks. The State Bank of Pakistan provided the data, which was cross-checked against the banks' financial statements. Research results show that a number of variables, including credit expansion, net interest margin, loan loss reserves, and bank diversification, have been linked to a notable rise in non-performing loans (NPLs). Conversely, NPLs were found to decrease due to operating efficiency, bank size, and Return on Assets (ROA). Furthermore, GDP growth rate was

associated with lower NPLs, while increases in interest rates and exchange rates were linked to higher NPLs.

Zamore, Leif, and Roy (2021) delved into the influence of microfinance institutions' (MFIs) cost efficiency on Non-Performing Loans (NPLs). Employing stochastic frontier analysis alongside Granger-causality tests and Generalized Method of Moments (GMM), the study examined the relationship among variables. World Bank data, spanning from 1998 to 2015 was gathered from 87 countries, containing sample of 607 rated MFIs. The findings resultant in a non-linear relationship between NPLs and operating costs.

Kumar et al. (2018) conducted an investigation into the factors influencing Non-Performing Loans (NPLs) within Fiji's banking sector. The research examined a number of factors that might influence nonperforming loans (NPLs), including bank management, economic development, inflation, real effective exchange rate, unemployment, remittances, political instability, and the global financial crisis.

Pooled Ordinary Least Squares (OLS), random effects, and fixed effects methods were employed for testing. Data spanning from 2000 to 2013 was obtained from the annual disclosure statements of banks, as well as the World Development Indicators and World Bank database. The dataset included five commercial banks and two non-bank financial institutions. Upon analysis, the authors observed a negative association between these variables and NPLs, while net interest margin exhibited a positive association with NPLs.

Ben Saada (2017) investigated the influence of control quality on NPLs in Tunisian Banks. Utilizing panel data regression analysis, the study focused on the period from 2010 to 2015 involving 11 listed banks. The results indicated a negative impact of institutional investors, foreign directors, and risk committees on NPLs, whereas state representatives showed a positive effect. Additionally, macroeconomic variables were considered, revealing a negative association between credit formation and GDP growth with NPLs, whereas inflation displayed a positive association.

Ghosh (2017) explored the association between NPLs and sectorial product and labor markets. Employing single equation Partial Least Squares (PLS) and instrumental variables regression, the author conducted the analysis on the US banking industry spanning from 1984Q1 to 2016Q2. Data was sourced from the Federal Deposit Insurance Corporation (FDIC). The analysis unveiled that high NPLs contribute to a decline in GDP growth. Furthermore, NPLs were found to decrease total and non-farm employment, as well as employment growth in the financial activities and construction sectors.

After classifying loans as either consumer, mortgage, or business, Louzis, Angelos, and Vasilios (2011) investigated the causes of non-performing loans (NPLs) in Greece's banking system. From 2003Q1 through 2009Q3, the authors used data from the nine biggest Greek banks to examine the relationships between variables using a dynamic panel data estimator. Nonperforming loans (NPLs) were the dependent variable, while the independent factors were state debt, low cost efficiency, high measured efficiency, small bank capitalization, bank size, net-interest income, leverage, performance, and ownership concentration. Government debt, the inefficiency index, and ownership concentration were shown to have a positive effect on nonperforming loans (NPLs), but net interest income and the Return on Equity (ROE) indicator were found to have a negative effect.

Us (2016) investigated the impact of the global crisis on the dynamics of Non-Performing Loans (NPLs) within the Turkish banking sector. From the fourth quarter of 2002 to the third quarter of 2013, data covering twenty-one deposit banks was retrieved from the Turkey Banks Association. For testing, the Hausman test was used to choose between the fixed effects and random effects models. Nonperforming loans (NPLs) were shown to be positively affected by increased capital adequacy, inefficiency, and bank dispersion, and negatively affected by increased lending, according to the research.

Shehzad, Jakob, and Bert (2009) scrutinized the impact of bank ownership concentration on bank risk factors, namely capital adequacy and NPLs. The research used information gathered between 2005 and 2007 from 500 commercial banks in 50 different countries. Previous studies, BankScope, and the World Bank's Development Indicators were used to compile the data. Assuming supervisory supervision and shareholder protection rights are in place, the Random Effects model found that a

concentration of bank ownership reduces nonperforming loans. Furthermore, capital sufficiency was positively affected by ownership concentration, subject to shareholder protection. Additionally, concentration of ownership at lower levels of shareholder protection rights and supervisory supervision lessened the riskiness of the bank.

Podpiera and Laurent (2008) investigated the connection between cost efficiency and NPLs to determine their roles as determinants of bank failures. Employing a Granger causality model, the study utilized a GMM dynamic panel estimator. Data spanning from 1994 to 2005 was collected from the balance sheets and income statements of 43 Czech banks sourced from Bank Scope. The findings supported the bad management hypothesis, revealing an insignificant relationship between NPLs and cost efficiency, along with a negative impact of cost efficiency on NPLs. Contrary to the bad luck hypothesis, no significant negative impact of NPLs on cost efficiency was observed. The study provided clear evidence for the bad management hypothesis, suggesting that a decline in cost efficiency leads to an increase in NPLs.

3. Research Methodology

3.1. Bank Specific Factors:

3.1.1. Credit Growth:

Studies have consistently demonstrated that faster credit growth is associated with higher loan losses, revealing a positive correlation between these variables (Ahmed et al., 2021; Naili and Younes, 2022). Based on these findings, the following hypothesis is formulated.

Hypothesis (H1): Faster credit growth leads to higher NPLs.

3.1.2. Loan Loss Provision:

Loan loss provisions are a tool for banks to deal with non-performing loans (NPLs), and there is a correlation between the two. A higher level of loan loss provision may indicate inefficiency in management (Ahmed et al., 2021). Based on these observations, the following hypothesis is formulated.

Hypothesis (H2): Loan Loss Provision have a positive impact on NPLs.

3.1.3. Bank Diversification:

The fact that banks generate non-interest revenue from things like asset management and trading shows that they're diversified. Earnings variations in banks are often caused by this non-interest revenue (Ahmed et al., 2021). Research has indicated a negative correlation between bank diversification and Non-Performing Loans (NPLs) (Naili and Younes, 2022). Based on these findings, the following hypothesis is formulated.

Hypothesis (H3): Bank diversification has a negative impact on NPLs.

3.1.4. Bank Size:

There has been conflicting evidence in the literature about the correlation between bank size and NPLs. Although there seems to be an inverse association between size and nonperforming loans (NPLs), it has also been noted that bigger banks may actually have fewer NPLs (Ahmed et al., 2021; Naili and Younes, 2022). Based on these findings, the following hypothesis is formulated.

Hypothesis (H4): Higher the bank size, lesser the NPL.

3.1.5. Bank Profitability:

Research has consistently demonstrated an inverse relationship between bank profitability and Non-Performing Loans (NPLs). Higher bank profitability is often associated with lower risk levels. Numerous studies have confirmed a negative impact between these variables (Ahmed et al., 2021; Naili and Younes, 2022). Based on these findings, the following hypothesis is formulated.

Hypothesis (H5): Bank profitability has negative impact on NPLs.

3.1.6. Net Interest Margin:

When banks increase their interest margin, their risk tends to decrease. Previous studies have established a direct relationship between net interest margin and Non-Performing Loans (NPLs) (Ahmed et al., 2021). Based on these findings, the following hypothesis is formulated.

Hypothesis (H6): Net interest margin has positive impact on NPLs.

3.1.7. Operating Efficiency:

Research has indicated an inverse relationship between bank operating efficiency and Non-Performing Loans (NPLs), with studies demonstrating a negative impact of operating efficiency on NPLs (Ahmed et al., 2021). Based on these findings, the following hypothesis is formulated.

Hypothesis (H7): Bank operating efficiency has a negative impact on NPLs.

3.2. Macroeconomic Factors:

3.2.1. Interest Rates:

As interest rates increase, borrowers tend to accumulate higher levels of debt, resulting in elevated Non-Performing Loans (NPLs). Conversely, reducing interest rates can lead to a decline in the NPL rate (Ahmed et al., 2021). Previous studies have underscored the positive relationship between interest rates and NPLs (Arham et al., 2020). Based on these findings, the following hypothesis is formulated.

Hypothesis (H8): Interest rate has a positive impact on NPL.

3.2.2. Exchange Rates:

New studies show that the main factor that determines the prevalence of non-performing loans is the exchange rate (Ahmed et al., 2021). Based on this study, the following hypothesis is formulated.

Hypothesis (H9): Exchange rate is associated with NPLs.

3.2.3. GDP Growth Rate:

Research has revealed that an enhancement of GDP rate facilitates easier repayment of consumer debt (Foglia, 2022). While GDP is commonly regarded as a determinant of Non-Performing Loans (NPLs) by many authors, Febo and Eliana (2022) found that NPL is not the primary determinant in China. Likewise, other studies have analyzed the relationship between NPLS and GDP,

showing a negative correlation (Dedu, Dan-Costin, and Maria-Alexandra, 2021; Naili and Younes, 2022; Foglia, 2022). Despite being a developing country, Pakistan demonstrates a negative impact of GDP on Non-Performance Loans (Ahmed et al., 2021). Based on the findings of these authors, the following hypothesis is formulated.

Hypothesis (H10): GDP growth rate has a negative impact on NPL.

3.2.4. Public Debt:

Research indicates a relationship between public debt or sovereign debt and Non-Performing Loans (NPL) (Naili and Younes, 2022). Recent studies have provided contrasting findings, with Foglia (2022) suggesting a negative relationship between public debt and NPLs, while Naili and Younes (2022) found a positive relationship. Based on the literature, the following hypothesis is formulated.

Hypothesis (H11): Public Debt is negatively associated with NPLs.

3.2.5. Unemployment Rate:

The unemployment rate, a macroeconomic variable, reflects that as a country's unemployment increases, households' ability to meet debt obligations decreases (Foglia, 2022). Many authors utilize the unemployment rate as a determinant of Non-Performing Loans (NPLs). Foglia (2022) investigated the impact of the unemployment rate on NPLs and found a positive relationship between them. Similarly, Arham et al. (2020) and Naili and Younes (2022) have also observed a significant impact of the unemployment rate on Non-Performance Loans. However, Kumar et al. (2018) found a negative relationship between unemployment and NPLs. Based on the literature, the following hypothesis is formulated.

Hypothesis (H12): Unemployment is positively related with NPL.

3.2.6. Credit To the Private Sector

The literature indicates that economic growth prompts banks to increase lending, as consumers gain the ability to repay their debts (Foglia, 2022). Moreover, it is evident that NPLs and credit to the

private sector are significantly correlated (Maria-Alexandra, 2021; Dedu, Dan-Costin, and Foglia, 2022). Based on these studies, the following hypothesis is formulated:

Hypothesis (H13): Credit to the private sector is positively associated with NPL.

3.3. Ownership Structure:

3.3.1. Government Ownership

Public banks are owned and controlled by the state, have been observed to potentially exhibit a higher rate of Non-Performing Loans (NPLs). These banks are tasked with promoting societal welfare and operating in the public interest (Ahmed et al., 2021). Based on previous studies, the following hypothesis is formulated.

Hypothesis (H14): Government ownership has a positive impact on NPL.

3.3.2. Family Ownership

A business or bank is considered to be owned by a family if it is controlled by members of that family. There seems to be an inverse relationship between family engagement and the Non-Performing Loan (NPL) ratio, since studies have shown that it may reduce the latter (Ahmed et al., 2021).

Hypothesis (H15): Family ownership has a negative association with NPL.

Framework:

The framework incorporates constructs from the prior research studies. (Foglia, 2022) and (Ahmed et. Al. 202).

4. Interpretation

This study aims to examine the cause-and-effect relationship among macroeconomic indicators, bank-specific factors, and ownership structure with Non-Performing Loans (NPLs) in the banking sector of Pakistan. We have selected a sample of 31 banks in Pakistan, consisting of 5 public sector banks, 22 private banks, and 4 foreign banks. Annual data spanning from 2011 to 2023 was collected from the IMF and the official website of the State Bank of Pakistan, encompassing the entire banking

sector of Pakistan. Building upon prior research, this study adopts the model proposed by Foglia (2022). We employed OLS Regression along with Quantile Regression to test the hypotheses. Unlike ordinary least squares (OLS) regression, which estimates the mean effect of the independent variables on the dependent variable, quantile regression provides estimates at various quantiles (e.g., the median, 25th percentile, 75th percentile). This allows for a more comprehensive understanding of how the independent variables impact different points in the distribution of the dependent variable. It is also less sensitive to outliers compared to OLS regression. Since it does not rely on the mean, extreme values do not disproportionately influence the estimates, making it more robust in the presence of outliers.

4.1. Theoretical Model

$NPL = \alpha + \sum Xit\ \beta 1 + €it$

Where;

$\sum X$ = Bank Specific Factors

= Macroeconomic Factors

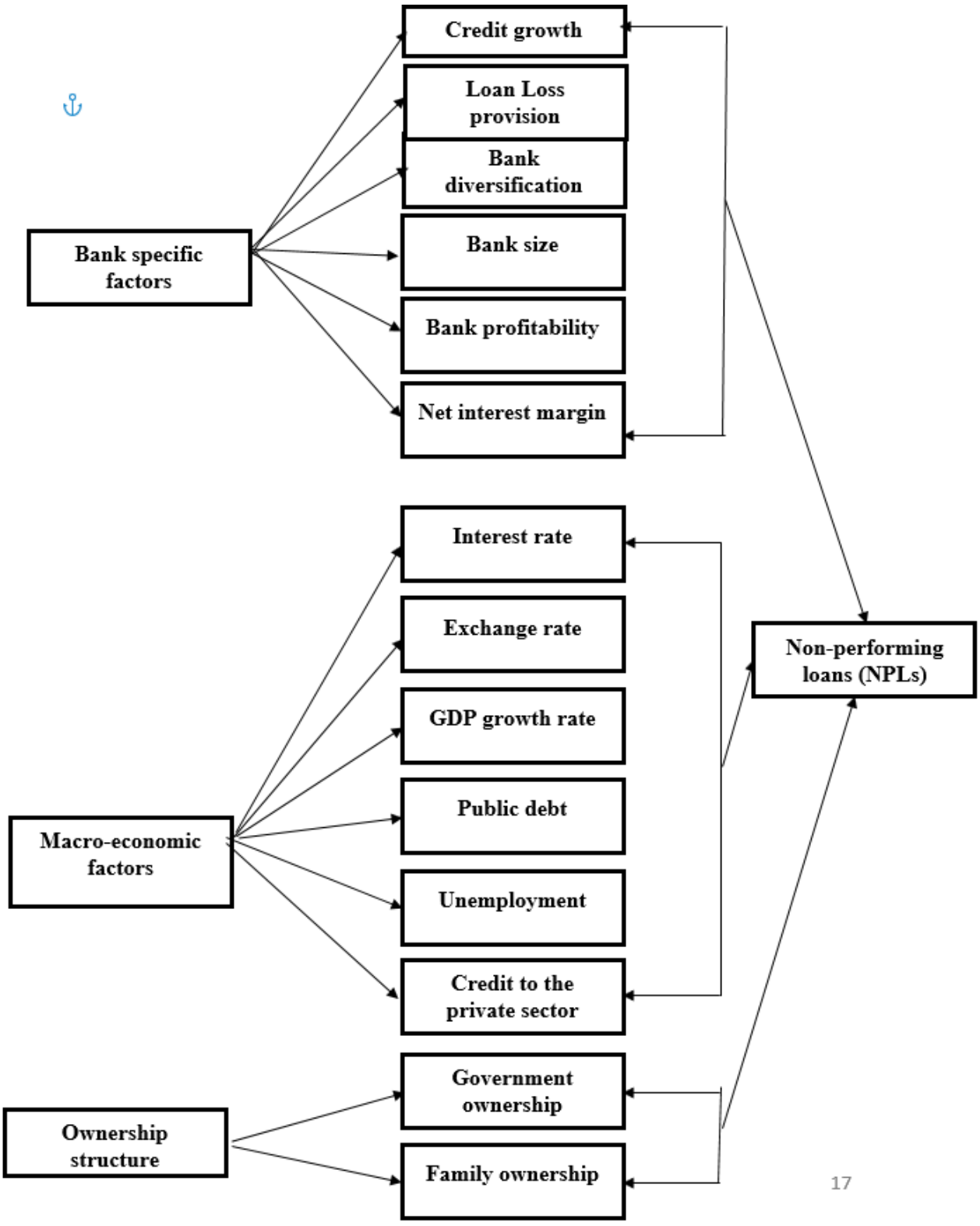
= Governance Factors

α = Constant

β = Beta Coefficient

$€$ = Error Term

This model explains the statistical relationship of antecedent variables with the dependent variable. Any change in an independent variable will cause a change in the dependent variable. This cause-and-effect dependency is examined through this model.



5. Data Analysis

In this research, two statistical tests are applied which are OLS Regression and Quantile Regression to check the impact of independent variables on the dependent variable. We have tested the sample data separately for all categories of banks of Pakistan with both of the econometric models.

5.1. Private Banks

5.1.1. OLS Regression – Private Bank

TABLE 2: Estimation of NPL

Excluding Macroeconomic Variables			**Including Macroeconomic Variables**		
Variables	**Coefficient**	**Std. Error**	**Variables**	**Coefficient**	**Std. Error**
Constant	-.339	.162	Constant	-.421	.287
Llp	-.010	.006***	Llp	-.010	.006***
cg	1.140	.127	cg	1.113	.132
Bd	.181	0.43	Bd	.192	.045
Boe	.786	.317*	Boe	.869	.325
Bs	-.083	.015	Bs	-.0.75	.017
Roa	.128	.669	roa	.562	.706
Nim	3.611	.938	nim	2.791	1.036
Go	1.337	1.845	Go	.617	1.922
Fo	-.090	.047**	Fo	-.106	.048**
			Ir	.319	.360
			Gr	-.001	.001
			Er	-.501	.824
			Ur	.006	.006
			Pd	.166	.409
			cps	.054	.181
F Stats	20.756	.06366	F Stats	12.803	.06374
Prob	.000	.06366	Prob	.000	.06374
Adj R^2	.523	.06366	Adj R^2	.522	.06374

Table 2 shows the results of OLS Regression. We segregated the results without macroeconomic factors and with macroeconomic factors. It illustrates that in the long term only few of the bank specific variables have shown the significance with NPLs. We have excluded the macroeconomic variables and it was seen that the Adjusted R^2 of the sample data was .523 and it has the standard error of .06366. Therefore, in the long-term Loan Loss Provision **(supporting H1),** Bank Operating Efficiency **(not supporting H7)** and Family Ownership **(supporting H14)** showed significant relation with NPLs. Normally, banks are not controlled by family members in Pakistan. The entire banking sector is controlled and managed by the central bank (State Bank of Pakistan) which may be the reason that the H7 is rejected.

When we include the Macroeconomic variables in the OLS Regression test, the results were same as before. It was seen that Macroeconomic variables do not help to predict the NPLs in the banking sector **(not supporting H8 to H13)**.

5.1.2. Quantile Regression - Private Banks

TABLE 3: Explaining the Model at different quartiles

Measurement	**0.25**	**0.50**	**0.75**
* Pseudo R^2	0.2486	0.2450	0.2935
** Pseudo R^2	0.2979	0.2890	0.3193

In the Quantile Regression, we see the impact of bank-specific and Macroeconomic variables in different Quantiles in Table 3. Through Pseudo R2, it is evident that if the value of NPLs increases, the effect of bank-specific variables will increase up to 30% in the 75^{th} quartile. If we include Macroeconomic variables, the impact of macroeconomic and bank-specific variables on NPLs will increase to 32% in the same quartile. There is not a big difference between each quartile in both of the cases.

TABLE 4: Estimation of NPL

Excluding Macroeconomic Variables				**Including Macroeconomic Variables**			
Variables	**Coefficient**			**Variables**	**Coefficient**		
	0.25	**0.50**	**0.75**		**0.25**	**0.50**	**0.75**
Constant	0.0486944	.1132265	-.0834772	Constant	0.2117647	.1012632	-0.1920364
Llp	0.0074346*	.0059818	-.0092488	Llp	0.0063051***	0.007212	-0.0108583
cg	0.0681063	.1700921	.8780231*	cg	-0.1588972**	0.0819827	0.6149011**
Bd	0.1600008*	.2380498*	.2807506*	Bd	0.1360832*	0.1830144*	0.2725487*
Boe	1.168481*	1.370824*	1.711853*	boe	1.14489*	1.146851*	1.556736**
Bs	-0.0238779*	-.0425833*	-.0833806*	Bs	0.0040708	-0.0225995	-0.0667285**
Roa	0.325433	-.1551496	.8483017	roa	-0.1218432	0.8744058	0.4085352
Nim	1.782365*	2.299519*	2.031071	nim	0.1644527	-0.1985983	0.9746543
Go	0.4459721	.0853327	3.585978	go	-0.533164	-0.4749195	1.575803
Fo	-0.0482143**	-.0372328	-.0964566	fo	-0.0865509*	-0.078261**	-0.1211505
				Ir	0.360181***	0.4118521	.2290759
				Er	-0.000899**	-0.0010852*	-0.0010505

				gr	-0.8158137	-0.4937842	0.0318052
				ur	0.0089331**	0.0065629	0.0031945
				pd	-0.0501099	0.1437525	0.5561982
				cps	0.0975212	0.0786151	0.035035

Table 4 shows the results of quantile regression. It presents that if we exclude the macroeconomic variables, the impact of Loan loss provision ends as soon as the amount of NPLs increases in the Private Banks. Similarly, it illustrates that as the amount of NPLs increases from 25% to 50% and then 75%, the impact of board diversification and board operating efficiency increase in the long term. Nonetheless as the NPLs amount increases to 75%, then the impact of Net Interest Margin will deteriorate on the NPLs. Family ownership had impact on NPLs at 25%, if the NPLs in the Private Banks of Pakistan increases from 25% than the impact of Family ownership will decline.

In the Quantile Regression after including the Macroeconomics variables, we have seen that in the long term if the value of NPLs increases, the impact of Loan Loss Provision will decline.

Credit growth has an impact on NPLs if the value of NPLs are too low or extremely high. If the amount of NPLs, in the Private banks are upto 25% than the credit growth will have an impact on NPLs at 5% significance level, and if the NPLs increases and are upto 75% than the credit growth will have impact at 5% significance level on NPLs.

It was seen that as the amount of NPLs increases from 25% to 50% and then 75%, the impact of board diversification and bank operating efficiency increases in the long term, at 1% significance level Board diversification and Bank operating efficiency have an impact on NPLs. But as the value of NPLs increases to 75% the impact of Bank Operating efficiency increases to the 5% significance level. Bank size had only impact on NPLs if the value of NPLs increases to 75%.

Family ownership had an impact on NPLs at 1% significance level but as the NPLS value increases to 50%, Family ownership will have impact on NPLs at 5% significance level.

Interest rate had only impact on the NPLs at 10% significance level if the NPLs amount in Private Banks are lower upto 25%. But as the value of NPL increases Interest rate loses its impact on NPLs.

Exchange rate has an impact on NPL in a way that if NPLs are upto 25% than the exchange rate has an impact at 5% significance level. But as NPLs increases, impact of exchange rate also increases at 10% significance level.

In contrast unemployment rate only has an impact on NPLs at 5% significance if the amount of NPLs in Banks are upto 25%. As soon as the NPLs increases the impact of Unemployment rate decline.

From the above results following equation has been formed:

$NPLs = \alpha + 0.614cg + 0.27bd + 1.55boe - 0.06bs – 0.07fo + 0.008ur – 0.36ir -0.001er + €$

5.2. Public Banks:

Table 5 illustrates the results of OLS regression which shows that for public banks of Pakistan when we excluded the macroeconomic variables, none of the bank specific variables showed significance with the NPLs. As we include macroeconomic variables, the results stated that loan loss provision have an impact on NPLs at 5% significance level. Interest rate had an impact on NPL at 1% significance level. While exchange rate had an impact on NPL at 10% significance level.

Public debt and credit to the private sector showed an impact on NPL at 5% significance level. With having Adjusted R^2 of .637, it was seen that on a 100% level if NPLs increases then there are only few bank specific and macroeconomics variables that had an impact on NPLs of Public banks of Pakistan.

5.2.1. OLS Regression – Public Bank

TABLE 5: Estimation of NPL

Excluding Macroeconomic Variables			**Including Macroeconomic Variables**		
Variables	**Coefficient**	**Std. Error**	**Variables**	**Coefficient**	**Std. Error**
Constant	-0.268	.384	Constant	.520	.528
Llp	-.002	.008	Llp	-.005	.008
cg	.370	.363	cg	.837	.371**
Bd	.164	.075	Bd	.095	.080
Boe	-.036	2.143	Boe	1.366	2.156
Bs	.039	.012	Bs	.040	.012
Roa	-2.997	.749	Roa	-3.074	.750
nim	-5.881	1.854	Nim	-6.545	1.749
Go	-.040	.037	Go	-.046	.037
Fo	-9.643	10.035	Fo	-4.936	10.482
			Ir	1.701	.695*
			Gr	.000	.001
			Er	-3.116	1.719***
			Ur	.018	.012
			Pd	-1.704	.815**
			Cps	-.818	.366**
F Stats	8.936	.07816	F Stats	7.331	.07172
Prob	.000	.07816	Prob	.000	.07172
Adj R^2	.569	.07816	Adj R^2	.637	.07172

5.2.2. Quantile Regression Public Sector Banks

TABLE 8: Explaining the Model at different quartiles

Measurement	**0.25**	**0.50**	**0.75**
* Pseudo R^2	0.4297	0.3458	0.4556
** Pseudo R^2	0.5090	0.4867	0.5630

As the OLS regression was performed at 100%, we also tested the sample using Quantile Regression at different Quantiles. In the Quantile Regression in Table 8, we have seen the impact of Bank-specific and Macroeconomic variables in different Quantiles. Through Pseudo R^2 we have seen that as the value of NPLs increases in the bank, the impact of Bank-specific variables will increase upto 45.56% in the 75th quantile. And if we include Macroeconomic variables than the impact of macroeconomic and bank-specific variables on NPLs will increase upto 56.30% in the same quantile.

TABLE 9: Estimation of NPL

Excluding Macroeconomic Variables				**Including Macroeconomic Variables**			
Variables	**Coefficient**			**Variables**	**Coefficient**		
	0.25	**0.50**	**0.75**		**0.25**	**0.50**	**0.75**
Constant	0.5956841	-0.0123028	-0.5240148	Constant	1.282145	.4303362	0.1194529
Llp	-0.0063899	0.0035343	0.0101563	Llp	0.0009816	-0.0133339	0.0075386
cg	-0.4711742***	0.1524769	0.6051315	cg	-0.1300963	0.9972981**	0.9345078***
Bd	0.1692262*	0.0913528	0.1372881	Bd	0.0793485	0.0547271	0.0241875
Boe	-2.525069	-0.4985597	2.715105	Boe	0.2285783	0.9913311	3.873591
Bs	0.0251661***	0.0294784***	0.0353365*	Bs	0.0316013*	0.0206052	0.0312047**
Roa	-3.83*	-3.270677*	-1.596417	Roa	-3.439012*	-3.401642*	-2.003916**
Nim	-	-	-	Nim	-	-	-

	4.145497*	5.266802**	6.984925**		7.931753*	5.848604*	7.979573*
Go	-0.0906303*	-0.0879158***	0.0402182	Go	-0.091606*	-0.0940488**	-0.0112958
Fo	-0.125232	-6.255465	-20.84018	Fo	1.188957	.6523045	-13.63287
				Ir	0.7231717	1.552204***	2.104626**
				Er	-0.000667	-0.0016275	-0.0003889
				Gr	-2.965691**	-3.079156	-2.148374
				Ur	0.0208061**	0.0203034	0.0022992
				Pd	-1.273802***	-1.305844	-1.282917
				Cps	-.5471964***	-0.5067211	-0.8596041***

After running the Quantile Regression test, we have seen in table 9 that if we exclude the macroeconomic variables, the impact of Credit Growth ends as soon as the amount of NPLs increases in the Public Banks. Similarly, it was seen that if the amount of NPLs is upto 25% then the impact of board diversification on NPL will be at 1% significance level. But as the NPLs amount increases from 25%, then the Net Interest Margin impact on the NPLs will also increase.

Board size had impact on NPLs at 25% and 50% at the 10% significance level. But as the NPLs amount increases in the public banks Board size impact got decline at 1% significance level. If the NPLs in the Public Banks of Pakistan increases from 50% than the impact of ROA will decline, but at the 25% Government ownership have an impact on NPLs at 1% significance level and at 50% Quantiles Government ownership have an impact on NPLs at 10% significance level.

The table 9 also shows results after including macroeconomic variables, in the long term it was seen that after including macroeconomic variables, Credit growth have an impact on NPLs at 5% and 10% significance level as soon the value of NPLs increases in the Public banks.

Bank size will have an impact on NPLs if the value of NPLs of the Public banks of Pakistan are very lower or much higher. As the NPLs amount increases from 25%, then the ROA and Net interest margin impact on the NPLs will also increase. At the 25% Government ownership have an impact on NPLs at 1% significance level and at 50% Quantiles Government ownership have an impact on NPLs at 5% significance level.

Interest rate had an impact on NPL at 10% significance level if the NPLs amount are upto 50% in Public banks but as the amount of NPLs increases the impact of interest rate reduces at 5% significance level. . While GDP growth rate and Unemployment rate had an impact on NPL at 5% significance level if the NPLs amount are upto 25% but as the NPLs increases the GDP growth rate loses its impact on NPLs. Public debt and credit to the private sector showed an impact on NPL at 10% significance level. Credit to the Private Sector will have an impact on NPLs if the value of NPLs of the Public banks of Pakistan are very lower or much higher.

It has been observed that hypothesis H16 and H17 are accepted, H16; Larger amount of NPL can be explained by Bank Specific Variables. H17; Larger amount of NPLs can be explained by Bank Specific and Macroeconomic Variables.

From the above results following equation has been formed:

$$NPLs = 0.934\ CG - 0.715BOE + 0.031BS - 2.00ROA - 1.27PD - 7.97NIM - 0.09GO + 2.10IR - 2.96GR - 0.85CPS + e$$

5.3. Islamic Banks:

5.3.1. OLS Regression - Islamic Banks

TABLE 11: Estimation of NPL

Excluding Macroeconomic Variables			**Including Macroeconomic Variables**		
Variables	**Coefficient**	**Std. Error**	**Variables**	**Coefficient**	**Std. Error**
Constant	.256	.274	Constant	.557	.361
Llp	.000	.009	llp	-.001	.009
cg	-.150	.349	cg	-0.54	.350
Bd	.175	.146	bd	.078	.154
Boe	-.281	.316	boe	-.328	.317
Bs	-.009	.016	Bs	.005	.017
Roa	-.169	.522	roa	-1.066***	.632***
Go	-.152	1.015	Go	-1.913	1.315
Fo	.052	.269	fo	.230	.285
			ir	.641***	.347***
			er	8.453E-005	.001
			ur	-2.171**	1.096**
			pd	.005	.007
			cps	-.626	.485
F Stats	2.398	.04134	F Stats	2.013	.04072
Prob	0.30	.04134	Prob	.044	.04072
Adj R^2	.172	.04134	Adj R^2	.196	.04072

The OLS regression results in Table 11 reveal that, for Islamic banks in Pakistan, excluding macroeconomic variables results in no significant correlation between bank-specific variables and NPLs. However, upon including macroeconomic variables, the findings indicate that ROA and interest rate affect NPLs at a 10% significance level, while the unemployment rate affects NPLs at a 5% significance level. With an Adjusted R^2 of 0.196, it is observed that at a 100% increase in NPLs, only

a few bank-specific and macroeconomic variables significantly impact the NPLs of Islamic banks in Pakistan.

5.3.2. Quantile Regression – Islamic Banks

TABLE 12: Explaining the Model at different quartiles

Measurement	**0.25**	**0.50**	**0.75**
* Pseudo R^2	0.2910	0.3040	0.1520
** Pseudo R^2	0.3955	0.3869	0.3286

As the OLS regression was performed at a 100%, we also tested the sample using Quantile Regression at different Quantiles. In the Quantile Regression analysis in Table 12, we observed the effects of bank-specific and macroeconomic variables across different quantiles. The Pseudo R^2 indicates that as NPL values rise in Islamic banks, the influence of bank-specific variables decreases to 15.20% in the 75^{th} quantile. Including macroeconomic variables, the combined impact of these variables on NPLs further decreases to 32.86% in the same quantile.

TABLE 13: Estimation of NPL

Excluding Macroeconomic Variables				**Including Macroeconomic Variables**			
Variables	**Coefficient**			**Variables**	**Coefficient**		
	0.25	**0.50**	**0.75**		**0.25**	**0.50**	**0.75**
Constant	0.512328	0.4332907	0.3236944	Constant	0.8890296	0.4772382	-0.0342927
Llp	0.001687	0.0052873	-0.0014966	Llp	-0.0059873	-0.0009557	0.0024749
Cg	-0.4886662	-0.3240864	-0.1370156	cg	-0.4783056***	-0.0194793	1.166298**
Bd	0.1584501	0.1464303	0.1683542	Bd	0.1002922	-0.0035	0.1934747

						629	
Boe	-0.6110171 *	-0.6347207***	-0.079609	Boe	-0.6964957*	-0.7151544**	-0.4595534
Bs	0.0044419	-0.205563*	-0.0182029 ***	Bs	0.127218	-0.0149993	-0.0626564*
Roa	-0.6024358	-0.2592334	-1.090443	Roa	-1.007879**	-1.074664	-0.7108617
Nim	-0.75527	1.489078	0.6422766	Nim	-0.8104637	-0.4915716	-0.6534238
				fo	0.1883295	0.0133241	-0.7071123
				Ir	0.5035298	0.4314516	0.657527
				Er	0.00041	-0.0000971	-0.0003025
				gr	-2.412347	-1.852249	-2.717718
				ur	0.0068057	0.0048179	0.0108082
				pd	-0.7273227***	-0.3383503	-0.622021
				Cps	0.1829905	0.1943743	0.1870438

After conducting the Quantile Regression test in table 13, it was observed that excluding macroeconomic variables results in an increased impact of bank operating efficiency as NPLs decrease in Islamic banks. Conversely, as NPLs increase, bank size influences NPLs significantly. At the 50th quantile, bank size impacts NPLs at a 1% significance level, while at the 75th quantile, it impacts NPLs at a 10% significance level.

The results in Table 13 also shows when include macroeconomic variables which indicate that in the long term, credit growth affects NPLs. It was observed that when NPL values are either very low or very high, only credit growth impacts NPLs.

Bank size influences NPLs significantly when the NPL values of Islamic banks in Pakistan are very high. As NPLs exceed 25%, ROA loses its impact on NPLs. At the 25th percentile, bank operating efficiency impacts NPLs at a 1% significance level, and at the 50th percentile, it impacts NPLs at a 5% significance level.

Public debt impacts NPLs at a 10% significance level, but this impact diminishes as NPL values increase.

Therefore, hypothesis H16 is accepted, indicating that a larger amount of NPLs can be explained by bank-specific variables. Hypothesis H17, which states that a larger amount of NPLs can be explained by both bank-specific and macroeconomic variables, is partially accepted, as macroeconomic variables do not aid in predicting bank-specific variables

From the above results following equation has been formed:
NPLs = 1.16 CG -0.715BOE -0.062BS -1.00ROA -0.727PD + e

6. Conclusion

The study aims to investigate the influence of bank-specific factors, macroeconomic conditions, and ownership structures on non-performing loans (NPLs) in Pakistani banks from 2011 to 2023. We used OLS and Quantile Regression to analyze variables separately for Islamic, private, and public banks.

The findings reveal that in Pakistani Islamic banks, a significant portion of NPLs can be attributed to bank-specific variables (Hypothesis H16) and a combination of bank-specific and macroeconomic variables (Hypothesis H17). Specifically, credit growth impacts NPLs, aligning with the results of Naili and Younes (2022) and Ahmed et al. (2021), which indicate a positive relationship between credit growth and NPLs when their levels are very high in Islamic banks. Bank profitability shows a negative correlation with NPLs, supporting the findings of Naili and Younes (2022). Additionally, bank operating efficiency negatively correlates with NPLs, corroborating the studies of Ahmed et al. (2021) and Naili and Younes (2022). Bank size also has a negative relationship with NPLs, consistent with Naili and Younes (2022). However, the study finds that public debt has a negative relationship with NPLs, which contradicts the findings of Naili and Younes but aligns with those of Foglia (2022).

In private banks, credit growth has shown a positive relationship with NPLs, supporting the findings of Naili and Younes (2022) and Ahmed et al. (2021). Bank operating efficiency also shows a positive relationship with NPLs, contradicting the previous research by Ahmed et al. (2021) and Naili and Younes (2022). Similarly, bank diversification has a positive relationship with NPLs, rejecting the earlier results of Naili and Younes (2022). Bank size exhibits a negative relationship with NPLs, aligning with the findings of Ahmed et al. (2021) and Naili and Younes (2022). Family ownership has a negative impact on NPLs, supporting the results of Ahmed et al. (2021). The unemployment rate has a positive relationship with NPLs, consistent with the studies by Naili and Younes (2022) and Foglia (2022). However, the interest rate shows a negative relationship with NPLs, contradicting the findings of Ahmed et al. (2021) and Arham et al. (2020). Finally, the exchange rate also has a negative relationship with NPLs, opposing the results of Ahmed et al. (2021).

In public banks, credit growth has shown a positive relationship with NPLs, supporting the findings of Naili and Younes (2022) and Ahmed et al. (2021). Bank operating efficiency has a negative relationship with NPLs, aligning with the results of Ahmed et al. (2021) and Naili and Younes (2022). However, bank size has a positive relationship with NPLs, contradicting the findings of Ahmed et al. (2021) and Naili and Younes (2022). Bank profitability shows a negative relationship with NPLs, supporting the findings of Naili and Younes (2022). Public debt has a negative relationship with NPLs, which does not support the findings of Naili and Younes but aligns with Foglia (2022).

The net interest margin has a negative relationship with NPLs, contradicting the results of Ahmed et al. (2021). Government ownership also shows a negative relationship with NPLs, contradicting the findings of Ahmed et al. (2021). The interest rate has a positive relationship with NPLs, supporting the studies of Ahmed et al. (2021) and Arham et al. (2020). Credit to the private sector has a negative relationship with NPLs, which does not match the findings of Foglia (2022). Finally, GDP growth rate has a negative relationship with NPLs, supporting the results of Ahmed et al. (2021), Foglia (2022), and Naili and Younes (2022).

6.1 Limitations

The study has collected data of some selected variables based on past researchers. Therefore, the results of the study are limited to only those variables selected on the basis of some recent past researches. Secondly, we employed two econometric models i.e. OLS Regression and Quantile Regression. Thirdly, we collected the data only from Pakistan. The time duration i.e. 2011 to 2023 is another limitation of the study.

6.2 Managerial Implications and Recommendations

The managerial implications of bank-specific and macroeconomic factors on non-performing loans (NPLs) are crucial for improving bank performance and maintaining financial stability. Here are several key implications:

Credit Growth Management

Rapid credit growth can lead to higher NPLs. Managers should implement stringent credit risk assessment and monitoring practices to ensure that loan growth is sustainable and not compromising credit quality. Develop robust credit scoring models and perform regular stress tests to evaluate the impact of various credit growth scenarios on the loan portfolio.

Operating Efficiency

High operating efficiency can reduce NPLs by improving overall bank performance and management practices. Focus on optimizing operational processes, adopting new technologies, and enhancing staff training to improve efficiency.

Bank Size

Larger banks may have different risk profiles compared to smaller banks. Effective risk management practices must be tailored to the bank's size. Scale-specific strategies should be implemented, such as centralized risk management for larger banks and more personalized oversight for smaller banks.

Profitability

Higher profitability is often associated with lower NPLs, indicating better overall health and risk management of the bank. Managers should aim to enhance profitability through diversified income streams, cost management, and prudent lending practices.

Bank Diversification

Diversified banks might experience different impacts on NPLs based on their diversification strategies. Ensure diversification strategies are balanced and aligned with risk management policies to avoid overexposure to risky sectors.

Unemployment Rate

Higher unemployment rates can lead to increased NPLs as borrowers may struggle to meet their loan obligations. Monitor macroeconomic indicators and adjust lending criteria accordingly. Implement proactive borrower assistance programs during economic downturns.

Interest Rate

Fluctuating interest rates affect borrowers' repayment capacities and can influence NPL levels. Develop flexible interest rate strategies and loan products that can adapt to changing rate environments. Offer fixed-rate loans during periods of expected interest rate volatility.

Public Debt

High public debt levels can impact the overall economic environment, affecting borrowers' ability to repay loans. Evaluate the potential impact of government debt on the economy and incorporate this into risk assessment models. Adjust lending strategies based on public debt trends.

GDP growth Rate

Strong GDP growth generally correlates with lower NPLs, indicating a healthier economic environment. Align business strategies with economic cycles, expanding lending during growth periods and tightening credit during recessions to mitigate risk.

Credit to Private Sector

Changes in the level of credit extended to the private sector can influence NPL ratios. Monitor credit conditions and private sector health to adjust lending practices. Encourage prudent borrowing and provide financial literacy programs to borrowers.

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