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Analyzing the Influence of Post-2018 Macroeconomic and Bank-Specific Indicators on Banking Sector Profitability: Evidence from Pakistan

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ABSTRACT

This study examines the impact of macroeconomic and bank-specific indicators on the profitability of Pakistan's banking sector, focusing on the volatile post-2018 period. Using return on assets (ROA) as the performance metric, it analyzes data from 20 commercial banks between 2018 and 2023. Panel data regression, conducted via Gretl software, reveals those internal factors – Capital Adequacy Ratio (CAR), Spread Ratio (SR), and Earnings per Share (EPS) – positively and significantly influence ROA, while Firm Size (SZ) has a significant negative effect. In contrast, macroeconomic indicators like Exchange Rate (EXR), GDP, and Policy Rate (POLR) show insignificant negative relationships, and Inflation (INF), Foreign Exchange Reserves (FXRV), and Cash Equivalents (CEQU) have insignificant positive effects. These findings highlight that bank-level factors play a more critical role than external economic conditions in determining profitability. The study recommends that bank managers focus on operational efficiency and risk control, while policymakers ensure institutional stability over macroeconomic adjustments.

1 Introduction

A nation's banking sector is essential to its economic progress, functioning as a vital intermediary in resource allocation and financial development (Iskandar et al., 2019). Banks support the economy by facilitating the flow of funds, managing risk, and fostering market openness (Allen & Santomero, 2001; Scholtens & Wensveen, 2000). The relationship between banking and economic development is reciprocal; as the banking industry grows, it reinforces broader economic stability (Seven & Yetkiner, 2016). However, banking inefficiencies and institutional failures can catalyze financial crises (Thakor, 2018). In Pakistan, the financial ecosystem comprises commercial and investment banks, insurance companies, national savings entities, and development finance institutions. The sector's performance is significantly influenced by macroeconomic factors, which are especially relevant in developing economies like Pakistan, where economic fluctuations and market reforms are more frequent and impactful (Rahaman et al., 2020; Badullahewage, 2018).

This area of study holds immense importance for both academics and policymakers due to the current economic volatility and the interconnectedness of global financial markets. Bank profitability in Pakistan is subject to multiple pressures: regulatory reforms, economic restructuring, inflationary

surges, and shifts in foreign capital flows. Jahan and Abdullah (2014) assert that bank performance is shaped by both internal characteristics and macroeconomic forces. The existing literature by Gazi et al. (2024), Smirlock (1985), Kamran et al. (2016), and Mule et al. (2015) further demonstrates that variables such as capital adequacy, operational efficiency, GDP, inflation, and firm size have a substantial influence over financial performance. The practical importance of these findings lies in their ability to guide strategic financial planning and monetary policymaking. With Pakistan facing significant economic disruptions post-2018, it becomes imperative to empirically assess how these shifts impact banking profitability.

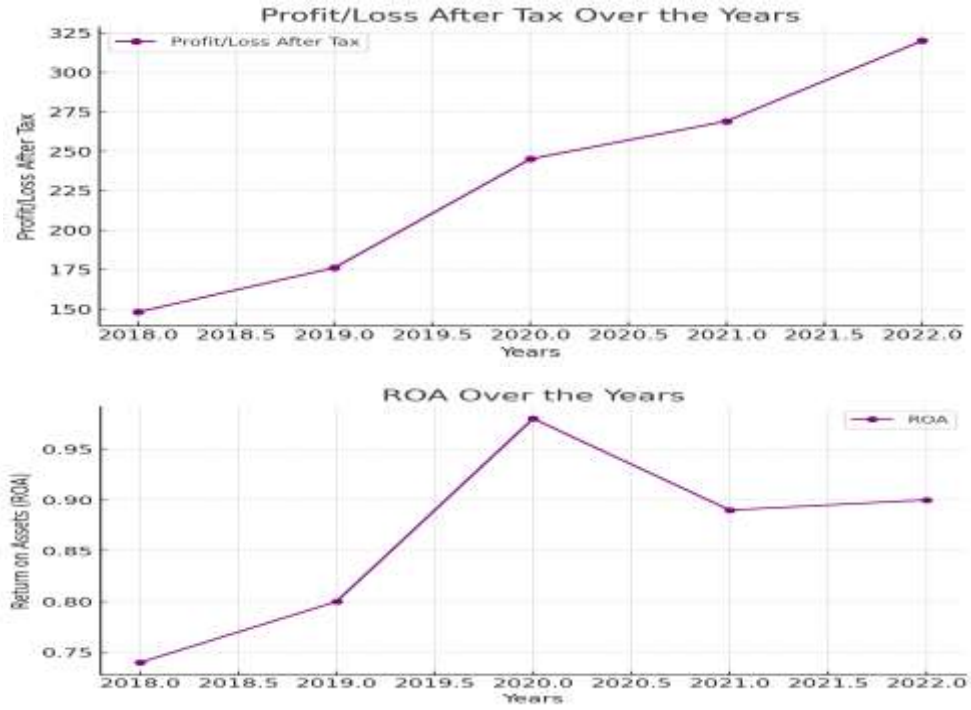
Following 2018, Pakistan's economy experienced a period of unprecedented macroeconomic distortions. These include the lowest GDP growth in the country's history (0.29%), record-breaking inflation above 38.5%, frequent foreign exchange fluctuations, depleted foreign exchange reserves, and the highest policy rate recorded at 22.5%. These shocks directly affect the banking sector, reducing loan demand, increasing non-performing loans (NPLs), and intensifying regulatory challenges. In Pakistan, Khan and Sattar (2014) demonstrate that rising interest rates correlate with improved bank profitability, suggesting a complex interaction between external economic variables and internal financial metrics. Yet, studies like those by Ongore and Kusa (2013) and Chowdhury and Rasid (2016) underline the unpredictable and non-linear impact of macroeconomic factors. Therefore, Pakistan's economic environment after 2018 presents a new research challenge, as traditional models may no longer adequately capture the reality.

This study identifies a clear research gap: existing literature fails to comprehensively analyze the compounded impact of bank-specific and macroeconomic variables on profitability in a post-2018 Pakistani context. Prior research often relies on data sets that do not reflect the sharp shifts in macroeconomic behavior seen after 2018. The current research, therefore, aims to offer a more nuanced analysis by exploring how these unprecedented shifts in economic indicators impact profitability. The lack of heterogeneity in earlier data masks the effects of structural economic changes that have fundamentally altered the operational environment for banks. The core problem this study seeks to address is how Pakistan's banking sector's profitability responds to the highly distorted macroeconomic and financial environment that emerged post-2018.

This study carries considerable significance. First, it captures a historical period of acute economic instability in Pakistan, providing insights that are both timely and relevant. By identifying how profitability responds to inflation, policy rates, exchange rate movements, and capital adequacy, this study contributes to financial management literature and enhances the predictive accuracy of profitability models. Second, the study offers policy-level guidance. By linking financial performance to macroeconomic shifts, it helps regulators craft targeted monetary and fiscal interventions. For instance, understanding how interest rate volatility affects ROA can shape SBP policy decisions. Third, the findings serve the banking sector by offering diagnostic tools for managing internal resources and navigating market instability.

The main objective of this study is to examine the impact of post-2018 macroeconomic and bank-specific indicators on the profitability of banks in Pakistan. The research intends to determine how economic downturns, currency devaluation, inflation, and reserve depletion affect key performance metrics like Return on Assets (ROA). It further aims to assess how bank-internal factors such as size, capital adequacy, cash reserves, and spread ratio interact with external variables to influence profitability. By systematically exploring these relationships, the study contributes to a more grounded understanding of the determinants of bank profitability in volatile emerging market contexts.

Pakistan's evolving financial landscape has made banking sector profitability and ROA increasingly tangled with the volatile post-2018 macroeconomic environment, as illustrated through State Bank of Pakistan data.



The remainder of the paper is structured as follows. Following this introduction, the literature review section presents a comprehensive summary of theoretical models and empirical findings related to bank profitability. The methodology section details the data sources, variable definitions, and estimation methods used to test the research hypotheses. The results and discussion section presents the findings from descriptive, correlation, and regression analyses. Finally, the conclusion offers a synthesis of the results, discusses their implications for policy and practice, and proposes directions for future research.

2 Literature Review and Hypotheses Development

Several economic theories serve as foundational pillars for understanding the profitability of banking institutions, particularly in the context of Pakistan. The Structure-Conduct-Performance (SCP) framework and Relative Market Power (RMP) hypothesis emphasize the role of market structure and dominance in shaping bank profitability (O'Connell, 2022; Berger, 1995; Salike, 2016). The SCP framework posits that banks in highly concentrated markets exploit reduced competition, leading to higher spreads and profitability. RMP supports this by asserting that banks with greater market power can offer unique products and influence pricing mechanisms. Efficiency-based theories also explain profitability, including the X-efficiency theory, which links managerial performance with profitability through operational control (Athanasoglou et al., 2008), and the scale efficiency theory, which argues that large banks benefit from economies of scale and reduced unit costs (Berger, 1995; Jeon & Miller, 2005; Kosmidou, 2008). In contrast, diseconomies of scale emerge when growth introduces managerial complexity and inefficiencies. The Arbitrage Pricing Theory (Ross, 1976) and the Quantity Theory of Money (QTM) further provide macroeconomic context. They respectively posit that multiple macroeconomic variables affect returns on financial assets and that inflation is primarily influenced by changes in money supply (Saeed & Akhter, 2012). Together, these theories provide the intellectual backdrop for assessing the impact of internal and external indicators on banking profitability. In developing economies like Pakistan, these theories provide a framework to assess how internal efficiencies and market positioning affect performance, particularly in a volatile macroeconomic context.

Empirical literature examining bank-specific variables presents consistent evidence on internal determinants of profitability. Hassan and Bashir (2003) include Pakistani banks in a Middle Eastern sample and find that bank size, leverage, and risk management significantly affect returns. Samad (2004) highlights liquidity and asset quality as key internal drivers. Javaid et al. (2011) focusses exclusively on Pakistan, identifying capital adequacy and managerial competence as major influences. Hoffmann (2011) finds a strong link between capital levels and profitability in U.S. banks, while Ameer (2013) confirms similar findings for Pakistani banks. More recent studies i.e. Yuan et al. (2022) suggest that bank size, asset structure, and cost-efficiency are universally significant, with ROA positively correlated with size and negatively with poor operational structure. These studies collectively reinforce those internal decisions on asset management, capital allocation, and operational structure remain crucial in determining bank profitability.

In the case of Pakistan, Khan et al. (2015) shows that while EPS, size, and capital ratio significantly affect ROA, variables such as spread ratio and cash equivalents are less consequential. Qayyum and Noreen (2019) also emphasizes the central role of bank-specific features in profitability, pointing to asset management quality and capital sufficiency. Raza et al. (2019) and Phillip T. G. (2020) conclude that financial metrics, especially capital strength and operational efficiency, remain key profitability determinants. This is consistent with Yuan et al. (2022), who find that debt-to-asset ratio and loan-to-deposit ratio affect profitability across Asian banks. Thus, it becomes evident that internal structures—more than any single external shock—largely determine how banks weather volatility. This leads to the first hypothesis:

H1: The profitability of Pakistan's banking industry is significantly influenced by bank-specific factors

Complementing this perspective, the influence of macroeconomic conditions cannot be understated. Drawing from Ross's Arbitrage Pricing Theory and the Quantity Theory of Money, it becomes evident that variables like GDP, inflation, and interest rates form core components of the profitability equation. Haron (1996) finds that Islamic and conventional banks are both constrained by external factors such as inflation and interest rates. Gerlach et al. (2005) similarly demonstrates that fluctuations in macroeconomic indicators like GDP, exchange rates, and aggregate demand strongly influence banking performance in developed economies. Gul et al. (2011) confirms a positive relationship between inflation, interest rates, and profitability in Nigeria and Pakistan. Studies by Sharma and Mani (2012), Babazadeh and Farrokhnejad (2012), reveal conflicting findings across Bangladesh, India, and Kenya. In Pakistan, Gul et al. (2011) report a positive correlation between inflation and profitability. However, later studies reveal more nuanced findings: Kanwal and Nadeem (2013) and Khan et al. (2015) show that GDP and interest rates have significant bearings, while inflation has mixed impacts. Osamwonyi and Michael (2014) in Nigeria note mixed effects of GDP and interest rate on ROA. Sheefeni (2015) also finds that interest rate volatility can dampen profitability, although inflation sometimes has a stimulating effect, especially when moderate. Gikombo and Mbugua (2018) confirm exchange rate volatility and inflation as influential. Studies by Olokoyo et al. (2021), Myra De Leon (2020) reinforce those macroeconomic indicators like inflation, GDP, interest rate, exchange rate, and foreign reserves impact profitability either positively or negatively across diverse contexts. Recent research continues to confirm this ambivalence. Ajaz et al. (2022) finds a weak correlation between exchange rate and ROE for Pakistani banks. Mustafa and Al Sharif (2023), examining Jordanian Islamic banks, show that most macroeconomic indicators positively influence ROA and ROE, except for foreign direct investment. Aslam et al. (2023) add that inflation and interest rates negatively affect non-performing loans, which in turn depress profitability. In the South Asian region, Venera Kelmendi (2024) uses panel data to confirm the significance of GDP, inflation, and exchange rate in shaping bank performance in Kosovo and Turkey. These studies establish the vital role of macroeconomic stability in banking performance, especially in volatile developing economies like Pakistan. Hence, the second hypothesis is as follows:

H2: The profitability of Pakistan's banking industry is significantly influenced by macroeconomic indicators

While internal and external factors are commonly studied separately, numerous empirical studies stress the importance of their interaction, often alongside industry-specific variables. Bashir (2003) and Hassan and Bashir (2003) show that bank performance improves with favorable macroeconomic conditions and robust internal ratios. Pasiouras and Kosmidou (2007) confirm that profitability is jointly shaped by capital strength, inflation, and interest rate dynamics. Staikouras and Wood (2011) similarly argue that both bank-specific features and macroeconomic shifts must be jointly evaluated to explain profitability variations.

Dietrich and Waldenried (2009) and Ennis et al. (2016) find that GDP growth influences profitability but that interest rate effects are inconsistent. Javaid (2016), Al-Homaidi et al. (2018), and Yao et al. (2018) show that capital adequacy, leverage, exchange rate, and GDP interact meaningfully. Caliskan and Silva (2020), Rahman et al. (2020), and Farooq et al. (2021) continue this line in Turkey and Pakistan, using OLS and GMM to show how market structure, innovation, and liquidity jointly drive profitability. In Pakistan, Gul et al. (2011), Bilal et al. (2013), and Kamran et al. (2016) show that spread ratios and leverage ratios interact with GDP and inflation to determine net income outcomes. Sarwar et al. (2018) and Wadood et al. (2020) go further, using OLS and GMM methods to demonstrate that market structure (industry-specific variable), when combined with capital adequacy and inflation, produces the most accurate predictors of profitability. Thus, a more comprehensive analytical framework becomes essential. Recent contributions by O'Connell (2022) and Bhattacharya et al. (2023) also factor in technological transformation as an emerging industry-specific determinant. Issa et al. (2024) study Shariah-based banks and find that profitability is negatively impacted by inefficiencies but positively linked to macroeconomic resilience. These findings suggest a confluence of determinants, internal, external, and structural, that interactively shape banking performance.

3 Research Methodology

This study examines the profitability determinants of Pakistan's banking sector by analyzing bank-specific and macroeconomic variables from 2018 to 2023. It focuses on commercial banks regulated by the State Bank of Pakistan (SBP), drawn from a total of 42 licensed banks, including commercial, Islamic, specialized, and microfinance institutions, forming the core of the country's financial intermediation. A random sampling technique selects 20 representative banks, ensuring equal selection probability and minimizing bias to improve objectivity, reliability, and generalizability.

The study uses Return on Assets (ROA) as the dependent variable, a widely recognized measure of profitability in banking research. ROA, defined as net income divided by total assets, indicates how efficiently banks use assets to generate earnings. It is extensively used in prior studies, including Williams (2003), Bougatef (2017), and Haris et al. (2019). Marimuthu (2008) argues that ROA more accurately reflects bank performance than return on equity, particularly in evaluating operational efficiency. The independent variables are categorized into bank-specific and macroeconomic indicators. Below is a summary table of variables used, with proxies/formulas and associated references:

Table 1

Variables of the Study

Variable	Formula/Proxy	Scholarly References
ROA (Profitability)	Net Income / Total Assets	Williams (2003), Bougatef (2017), Haris et al. (2019), Marimuthu (2008)
EPS	Net Income / Total Common Shares Outstanding	Khan et al. (2015), Nazir et al. (2022)
Size (SZ)	Log (Total Assets)	Ahamed (2017), Bougatef (2017), Wasiuzzaman and Tarmizi (2010), Bashir (2003)
Cash Equivalents (CEQU)	Short-term liquid assets / Total Assets	Khan and Ali (2016), Molyneux and Thornton (1992), Idris et al. (2011)
Spread Ratio (SR)	Lending Rate − Deposit Rate (%)	Gazi et al. (2024), Al-Homaidi et al. (2018), Yuan et al. (2022), Javaid (2016)
CAR	Total Equity / Total Assets	Abel and Le Roux (2016), Alper and Anbar (2011), Antoun et al. (2018), Mohiuddin (2017)
Inflation (INF)	% Annual Change in CPI	Alper and Anbar (2011), Djalilov and Piesse (2016), Masood et al. (2012)
GDP	GDP growth rate (%)	Ongore and Kusa (2013), Pasiouras and Kosmidou (2007), Dietrich and Wanzenried (2009)
Exchange Rate (EXR)	log (USD/PKR exchange rate)	Chowdhury and Rasid (2016)
FX Reserves (FXRV)	Annual total (USD millions)	Baksay et al. (2012), Dominguez et al. (2012)
Policy Rate (POLR)	Annual average SBP policy rate (%)	Dietrich and Wanzenried (2009), Saona (2016), Masood et al. (2012)

Econometric Equation:

$$ROA_{it} = \alpha + \beta 1 EPS_{it} + \beta 2 SIZE_{it} + \beta 3 CEQU_{it} + \beta 4 SR_{it} + \beta 5 CAR_{it} + \beta 6 INF_{it} + \beta 7 GDP_{it} + \beta 8 EXR_{it} + \beta 9 FXRV_{it} + \beta 10 POLR_{it} + \varepsilon_{it}$$

ROA denotes the return on assets for bank *i* at time *t*, where *i* represents each bank (i = 1 to 20) and *t* spans the period 2018–2023; ε_{i} is the error term capturing unobserved heterogeneity. The model is designed to test the influence of various internal and external factors, along with their interactions, on the profitability of commercial banks operating within Pakistan's dynamic post-2018 environment. It accounts for both bank-level heterogeneity and external macroeconomic shocks and is estimated using Fixed Effects, Random Effects, and robust regression techniques to address potential endogeneity and omitted variable bias.

The study employs a linear panel regression model and Generalized Method of Moments (GMM) for empirical analysis. Initially, panel estimators such as Pooled OLS, Fixed Effects, and Random Effects are employed, with the Hausman test used to determine the more consistent model between FE and RE. Subsequently, to mitigate endogeneity, the two-step Generalized Method of Moments (GMM) is applied, which uses lagged instruments and addresses heteroskedasticity (Zarrouk et al., 2016; Chowdhury & Rasid (2016); Zaefarian et al., 2017). As emphasized by Antonakis et al. (2010) and Lim et al. (2023), endogeneity arises when explanatory variables correlate with the error term, leading to biased estimates. GMM corrects for this by instrumenting endogenous regressors (Baltagi, 2005; Roy et al., 2014).

4 Results and Analysis

The descriptive statistics for the variables used in this study reveal critical insights into the profitability landscape of Pakistan's banking sector.

Table 2

Model Results from Descriptive Analysis

VARIABLES	Mean	Median	Standard Deviation	Minimum	Maximum
ROA	0.973	1	0.923	-5.2	4.42
GDP	5.826	5.838	.0720	5.705	5.926
INFL	14.448	9.12	9.898	5.70	33.43
POLR	11.416	9.625	5.520	6.50	22.0
EXR	183.073	164.015	52.150	122.1	285.58
FXRV	17.266	15.9	3.576	14.0	24.4
CAR	16.586	16.285	3.103	7.50	26.2
SIZE	1.491	1.0375	1.322	0.152	6.67
CEQU	0.144	0.084	0.163	0.012	0.82
S.R	4.880	4.6	1.889	2.10	13.3
E.P.S	9.885	6.015	10.849	-7.95	54.9

Return on Assets (ROA), with a mean of 0.973 and a median of 1.0, shows that banks, on average, earn close to 1% on their assets. The wide standard deviation of 0.923 and a range from -5.20 to 4.42 indicate a notable disparity in bank performance, suggesting operational and strategic inefficiencies across different institutions. This finding is consistent with earlier studies, such as Mezan Bank, MCB, SCB, ICBC, and UBL outperforming while banks like BOK, Sindh, ISLAMI, JS, and SONERI lag behind. These variations underscore the influence of internal efficiencies and external shocks. GDP shows a stable mean of 5.826 with very low variation (SD = 0.072), reflecting economic steadiness in Pakistan.

Table 3

Model Results from Correlation Analysis

	ROA	GDP	INFL	POLR	EXR	FXRV	CAR	SIZE	C.EQU	S.R	E.P.S
ROA	1										
GDP	-0.0018	1									
INFL	0.2732	0.2714	1								
POLR	0.2427	0.1427	0.9277	1							
EXR	0.2776	0.0699	0.9764	0.9399	1						
FXRV	-0.0920	-0.0470	-0.4425	-0.6443	-0.4328	1					
CAR	0.4215	-0.1786	0.3214	0.3149	0.3680	-0.1224	1				
SIZE	0.1831	0.0885	0.3046	0.2674	0.3015	-0.0409	0.3103	1			
C.EQU	0.1750	-0.1339	0.0709	0.0619	0.1018	0.0472	0.1992	0.4186	1		
S.R	0.4533	-0.0612	0.4657	0.5213	0.4931	-0.3929	0.3590	0.1379	0.1397	1	
E.P.S	0.4468	0.0521	0.4358	0.3919	0.4394	-0.1125	0.4263	0.7279	0.3176	0.2830	1

However, the correlation between GDP and ROA is almost negligible (-0.0018), suggesting a weak link between macroeconomic growth and bank profitability, aligning with findings by Sharma and Mani (2012) and Dodi and Arief (2018). Inflation displays greater variability (SD = 9.898) and has a modest positive correlation (0.2732) with ROA, suggesting that banks may adjust interest rates in

inflationary periods to protect or enhance profitability, as supported by Perry (1992). The Policy Rate (mean = 11.416; SD = 5.52) is positively correlated with ROA (0.2427), indicating potential for enhanced profitability through wider spreads. Exchange Rate volatility is pronounced (SD = 52.15), and its correlation with ROA (0.2776) implies that depreciation might improve foreign asset values or transaction-based income.

Foreign Exchange Reserves (FXRV) show a weaker negative correlation i.e. (-0.0920) with ROA, suggesting minimal direct influence. EPS (mean = 9.885; SD = 10.849) exhibits a strong positive correlation with ROA (0.4468), reaffirming its value as a performance indicator. Spread Ratio (SR), with a mean of 4.88 and SD of 1.889, also shows a strong positive relationship with ROA (0.4533), underlining its role in income generation interest. Capital Adequacy Ratio (CAR), with a mean of 16.586 and SD of 3.10, maintains a significant positive correlation with ROA (0.4215), highlighting capital strength as a stabilizing profitability factor. Bank Size (SZ) and Cash Equivalents (CEQU) show weaker but positive correlations (0.1831 and 0.1750 respectively), supporting the notion that liquidity and scale provide moderate advantages.

Correlation analysis further illustrates relationships among variables. Bank-specific factors EPS, SR, and CAR consistently show strong positive correlations with ROA. Bank Size and CEQU show mild positive associations, as echoed by studies such as Khan and Ali (2016) and Sultan et al. (2020). Macroeconomic variables demonstrate mixed relationships. GDP again displays minimal impact, while Inflation, Policy Rate, and Exchange Rate correlate moderately and positively, suggesting possible indirect effects through interest margins or valuation gains. Inter-variable correlations, such as Inflation with Policy Rate (0.9277) and Exchange Rate with Inflation (0.9764), reveal tight linkages within macroeconomic variables. Size's strong correlation with EPS (0.7279) further illustrates operational scalability's influence on shareholder returns.

Table 4

Model Results from Pooled OLS, Fixed Effect

Variables	POL		Fixed		Random	
	Coefficient	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
CONSTT.	−0.4056	0.8564	6.3693	0.2044	3.9722	0.2109
GDP	−2.1831e05	0.9959	−0.0123	0.1676	−0.0079	0.1672
INFL	0.0395	0.5651	0.1318	0.2386	0.0966	0.2532
POLR	−0.0234	0.5069	0.0149	0.5350	−0.0002	0.9926
EXR	−0.0065	0.6055	−0.0216	0.2375	−0.0163	0.2542
FXRV	0.0126	0.5077	0.0380	0.0906 *	0.0256	0.0966 *
CAR	0.0645	0.0831 *	−0.0169	0.5999	0.0157	0.1899
SIZE	−0.2029	0.0140 **	−0.1980	0.2074	−0.1551	0.0802 *
CEQU	0.3683	0.3124	−1.0004	0.0582 *	−0.6427	0.1220
SR	0.1681	0.0625 *	0.0886	0.1280	0.1140	0.0551 *
EPS	0.0412	0.0011***	0.0302	0.0206**	0.0369	0.0013***
R-squared	0.3977		0.3867		0.3427	
Adjusted Rsqd	0.3425		0.7791		0.3401	
P-value (F)	0.0001		0.0001		0.0001	
Durbin Watson	-		1.7803		1.7803	
HousmanSpcfn	-		If p < 0.05		P-value = 0.1732 > .05	
rho	0.5922		−0.0627		−0.0627	

Note. * p < 0.10, ** p < 0.05, *** p < 0.01

Model results from Pooled OLS, Fixed Effect, and Random Effect estimations indicate that 34% to 39% of ROA variation is explained by the variables. EPS consistently shows a significant positive

effect on ROA across all models, consistent with findings by Khan, Kauser and Abbas (2015). SR also demonstrates a significant positive effect, especially in REM. Size, however, shows a significant negative association in OLS and REM, suggesting possible diseconomies of scale as firms grow. CEQU is negatively related to ROA but statistically insignificant, echoing concerns by Molyneux and Thornton (1992) about holding excessive non-earning assets. Macroeconomic indicators, including GDP, Inflation, Policy Rate, and Exchange Rate, fail to reach statistical significance, confirming the minimal direct impact noted by Alper and Anbar (2011) and Ovamba (2014). FX Reserves appear significant at the 10% level in REM, indicating a potential but weak stabilizing influence. GMM analysis confirms these findings.

Table 5

Model Result from GMM Analysis

Variables	**ROA**			
	Coefficient	**Std. Error**	**z**	**p-value**
CONST	−0.4056	4.1042	−0.0988	0.9213
GDP	−0.0000218	0.0077	−0.0028	0.9978
INFL	0.0395	0.1008	0.3922	0.6949
POLR	−0.0234	0.0637	−0.3669	0.7137
EXR	−0.0065	0.0191	−0.3373	0.7359
FXRV	0.0126	0.0315	0.3980	0.6906
CAR	0.0645	0.0177	3.639	0.0003 ***
SIZE	−0.2030	0.0561	−3.613	0.0003 ***
CEQU	0.3683	0.2537	1.451	0.1467
SR	0.1681	0.0550	3.050	0.0023 ***
EPS	0.0412	0.0091	4.494	<0.0001***
Mean dept. var	0.9733			
S. D .dept var	0.9232			
GMM criterion	Q = 4.84 e-025 (TQ = 5.80 4e-023)			

Note. * p < 0.10 ** p < 0.05, *** p < 0.01

With reference to the bank-specific factors the study finds, a significant positive correlation between CAR (shareholders' equity to total assets) and ROA in Pakistan's banks, indicating greater stability and lower risk. This supports Khan et al. (2015) and Nisar et al. (2017), Ashraf et al. (2017), and Bilal et al. (2013) also note a positive but insignificant impact. Gazi et al. (2024), however, suggest high equity financing may reduce profitability due to cheaper alternatives. Bank size (SZ) shows a significant negative effect on ROA, suggesting reduced profitability in larger banks due to inefficiencies, aligning with Khan, Kauser and Abbas (2015), O'Connell (2022), and Bennaceur and Goaied (2008). While Aladwan (2015) and Adelopo et al. (2017) find minimal impact. Smirlock (1985) links this to economies of scale, whereas Pasiouras and Kosmidou (2007) highlight a non-linear relationship due to regulatory and agency costs. Nevertheless, there is a significant positive impact of Spread Ratio (SR) on ROA, indicating higher interest spreads enhance bank profitability, supported by Gazi et al. (2024), Al-Homaidi et al. (2018), Curak et al. (2012), and Yuan et al. (2022). In contrast, Javaid (2016) and Chowdhury and Rasid (2016) report differing results. Also, the study finds a strong positive link between EPS and ROA, suggesting higher earnings per share enhance bank profitability, consistent with Khan, Kauser and Abbas (2015), and Ashraf et al. (2017). However, Nazir et al. (2022) report a negative relationship between ROA, share price, and EPS. Related to cash equivalents the study finds a positive but insignificant association between cash equivalents (CEQU) and ROA, indicating liquidity has no significant impact on profitability, aligning with Chandra (2001) and Haron (2004). While liquidity may reduce profitability due to opportunity costs (Paul et al., 2020; Al

Nimer et al., 2015), banks benefit from liquidity-driven performance (Khan & Ali, 2016). These results contrast with Bourke (1989), Molyneux and Thornton (1992), and Idris et al. (2011).

As for as the macroeconomic indicators are concerned the study finds an insignificant negative impact of GDP on bank profitability in Pakistan, aligning with Venera Kelmendi (2024), Gazi et al. (2024), Sufian (2011) and Dodi and Arief (2018), who argue GDP growth doesn't guarantee profitable lending. Economic upturns may ease lending standards, increasing credit risk. Conversely, Athanasoglou et al. (2008), Esther et al. (2016), Tan (2016), and Bouzgarrou et al. (2018) report a significant positive GDP-profitability link. There is a positive but insignificant relationship between inflation and ROA, consistent with Olokoyo et al. (2021), Gazi et al. (2024), Ovamba (2014), Zopounidis and Kosmidou (2008), Alper and Anbar (2011), and Khan et al. (2015). Perry (1992) noted that unanticipated inflation may harm profitability. However, Moualhi et al. (2016) report a significant negative link between inflation and bank profitability. A negative but insignificant relationship excist between policy rate (POLR) and ROA, indicating no impact on bank profitability, consistent with Caliskana and Lecunab (2020), Olokoyo et al. (2021), Nolle and Rice (1997), and Khan et al. (2015). However, Alper and Anbar (2011), Acaravci and Çalim (2013), Sheefeni (2015), and Topak and Talu (2017) report a positive effect. Also a negative but insignificant relationship is present between exchange rate and ROA, consistent with Olokoyo et al. (2021), Topak and Talu (2017), Hasanov et al. (2018), Sarwar (2018), Adama and Togbenou (2017), Ovamba (2014), Ramadan et al. (2011), Rao and Lakew (2012), and Ongore (2013). However, Davydenko (2010) and Akani et al. (2016) report a significant positive effect. Whereas there is a positive but insignificant relationship between foreign exchange reserves (FXRV) and ROA. While no direct research exists for Pakistan, Baksay et al. (2012) highlight the impact of reserve management on state bank profit-loss, and Dominguez et al. (2012) link higher reserves to improved economic conditions that may indirectly affect bank profitability.

In summary, the analysis confirms that among the examined variables, bank-specific factors—namely Capital Adequacy Ratio (CAR), Spread Ratio (SR), and Earnings Per Share (EPS)—have a statistically significant positive impact on ROA, while Cash Equivalents (CEQU) show a positive but insignificant relationship. Conversely, Firm Size (SZ) has a significant negative effect on ROA. These findings validate Hypothesis H1, affirming that bank-specific factors significantly influence the profitability of Pakistan's banking sector (Saeed, 2015; Yao, Muhammad, and Gulzara, 2018; Javaid, 2016; Yuan et al., 2022). On the other hand, macroeconomic indicators—GDP, Exchange Rate, and Policy Rate—exhibit insignificant negative associations with ROA, whereas Inflation and Foreign Exchange Reserves show insignificant positive links. These results offer a strong basis to reject Hypothesis H2, suggesting that macroeconomic variables have no significant effect on bank profitability in Pakistan, consistent with prior studies (Alper & Anbar, 2011; Sharma and Mani, 2012; Ovamba, 2014).

5 Conclusions and Recommendations

This study concludes that the profitability of Pakistan's banking sector between 2018 and 2023 is primarily driven by internal bank-specific factors rather than external macroeconomic conditions. Among the eleven variables examined—five macroeconomic and six bank-specific—only Capital Adequacy Ratio (CAR), Spread Ratio (SR), and Earnings Per Share (EPS) exhibit statistically significant positive effects on Return on Assets (ROA). These findings indicate that banks with stronger capital bases, efficient intermediation through higher spreads, and stronger earnings per share tend to achieve better profitability. The evidence suggests that internal efficiencies, such as robust financial controls and pricing strategies, play a more decisive role than macro-level fluctuations in shaping profitability. Firm size (SZ) shows a significant negative effect, implying that larger banks may suffer from diseconomies of scale, potentially due to inefficiencies in management or bureaucratic rigidity. Macroeconomic variables, including GDP, inflation, policy rate, and exchange rate, demonstrate statistically insignificant relationships with ROA, indicating that profitability is insulated from broader economic shifts in the short term. Cash Equivalents (CEQU)

and Foreign Exchange Reserves (FXRV) show positive but non-significant relationships, pointing to their limited direct influence on immediate profitability despite their importance in liquidity and stability management.

These findings align partially with theoretical frameworks such as the Relative Market Power (RMP) hypothesis and Market Structure Theory. The positive effects of SR and EPS confirm the RMP premise that banks with strategic pricing and product power can optimize returns. CAR's influence supports Market Structure Theory, where financial strength enhances stability and ultimately profitability. However, the negative association between size and ROA challenges the Scale Efficiency Theory, suggesting that expansion does not necessarily equate to efficiency or profitability. Additionally, the minimal impact of macroeconomic variables undermines the explanatory power of the Theory of Arbitrage Pricing and the Quantity Theory of Money (QTM), which traditionally assert that economic fluctuations should directly affect banking outcomes. Therefore, the results emphasize that for the Pakistani context, particularly in the post-2018 period marked by volatility, micro-level management and operational effectiveness are far more predictive of profitability than macro-level indicators.

These insights have vital implications for strategic and policy decision-making. To improve profitability, banks must prioritize internal optimization, beginning with enhancing their capital adequacy. Maintaining adequate capital buffers strengthens not only solvency but also risk-adjusted profitability. Strengthened governance and risk management frameworks support this goal and contribute to market credibility. A focused effort on improving spread ratios through strategic interest rate management is also recommended. Banks should regularly assess their lending and deposit pricing strategies, use scenario-based forecasting to evaluate monetary policy changes, and adjust portfolios to optimize returns. Diversifying into high margin lending sectors and offering tailored products to underserved markets can further support spread enhancement. In parallel, EPS can be improved by focusing on revenue diversification, cost optimization, digitalization, and sustainable earnings models. Transparent financial reporting, consistent dividend strategies, and innovation-driven business models can attract investors and boost confidence.

Regulatory frameworks must also adapt to evolving market realities. The State Bank of Pakistan should enhance capital adequacy and liquidity standards, stress-testing protocols, and oversight for digital platforms. Tailored monetary policies may be needed to accommodate the different needs of small and large banks. Supporting innovation, especially in financial technology, while maintaining risk oversight, can bridge access and cost challenges. Sectoral diversification is essential. Banks must be encouraged to expand into agriculture, exports, textiles, IT, and SMEs, aligning lending practices with national development goals. Offering customized financial services to rural and underserved regions can broaden revenue bases and enhance financial inclusion.

Future research should explore macroeconomic and bank-specific variable dynamics in greater depth, particularly by extending analysis beyond 2018 or comparing pre- and post-crisis periods. Incorporating factors such as non-performing loans, foreign direct investment, digital transformation, and business cycles using advanced econometric methods like dynamic panel models or machine learning could reveal nuanced relationships. Comparative studies with similar developing economies and mixed-method approaches, including interviews and case studies—may offer broader contextual understanding. This would help policymakers, regulators, and bank managers develop targeted strategies for sustaining profitability and resilience in Pakistan's evolving financial landscape.

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