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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 that these 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.

Keywords: Banking sector profitability, Pakistan, Foreign Exchange Reserves, Policy Rate, Generalized Method of Moments

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1. Introduction

The banking sector plays an important role in national economic development, 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 supporting financial-market activity (Allen & Santomero, 2001; Scholtens & Van Wensveen, 2000). The relationship between banking and economic development is reciprocal; banking development can support broader economic stability (Seven & Yetkiner, 2016). However, banking inefficiencies and institutional failures can contribute to financial instability (Athanasoglou et al., 2008). In Pakistan, the financial system includes commercial and investment banks, insurance companies, national savings entities, and development finance institutions. The sector's performance is significantly influenced by macroeconomic factors, which warrant particular attention in developing economies facing economic fluctuations and financial reforms (Rahman et al., 2020; Badullahewage, 2018).

The determinants of bank profitability matter to researchers and policymakers, particularly during periods of economic volatility and increasing financial interconnectedness. Bank profitability in Pakistan faces multiple pressures: regulatory reforms, economic restructuring, inflationary surges, and shifts in foreign capital flows. Jahan and Abdullah (2014) suggest that bank performance is shaped by both internal characteristics and macroeconomic forces. Similarly, research by Gazi et al. (2024), Smirlock (1985), Kamran et al. (2016), and Mule et al. (2015) indicates that variables such as capital adequacy, operational efficiency, GDP, inflation, and firm size may substantially influence financial performance. These findings can inform strategic financial planning and monetary policymaking. With Pakistan facing significant economic disruptions post-2018, therefore, it is important to examine the association between these changes and bank profitability.

Following 2018, Pakistan's economy experienced pronounced macroeconomic instability. This period included pronounced changes in GDP growth, inflation, exchange rates, foreign exchange reserves, and the policy rate. The reported historical extremes for these indicators require verification against their definitions and official data series. Such shocks may affect banks through credit demand, non-performing loans (NPLs), funding costs, and regulatory pressures (Kanwal & Nadeem, 2013; Rahman et al., 2020). In Pakistan, Khan and Sattar (2014) report that rising interest rates correlate with improved bank profitability, indicating a potentially complex relationship between external economic variables and internal financial metrics. Yet, studies such as Ongore and Kusa (2013) and Chowdhury and Rasid (2016) highlight variation in the reported effects of macroeconomic factors. Therefore, Pakistan's economic environment after 2018 provides a relevant setting for reassessing the determinants of bank profitability under changing macroeconomic conditions.

This study identifies a clear research gap: although bank-level and macroeconomic determinants have been studied in Pakistan, their estimated associations during the 2018–2023 period of marked instability warrant renewed examination (Khan et al., 2015; Rahman et al., 2020). Several prior investigations use earlier observation periods and may not fully capture the macroeconomic changes observed after 2018. This study therefore examines how the selected indicators are associated with profitability during the study period. In addition, the simultaneous movement of macroeconomic indicators during this period makes it important to distinguish their individual associations with profitability from common economic shocks. This study addresses how bank profitability in Pakistan responds to the volatile macroeconomic and financial environment that emerged post-2018. Accordingly, the distinctive contribution is the joint examination of these bank-specific and macroeconomic indicators over a clearly bounded period, rather than a claim that the determinants themselves have not been investigated (Javaid et al., 2011; Rahman et al., 2020).

The study contributes evidence from a period of economic instability in Pakistan. By estimating the relationships between profitability and inflation, policy rates, exchange rate movements, and capital adequacy, this study contributes to financial management literature and offers additional evidence for evaluating profitability models. In addition, the findings may inform policy discussion. By linking financial performance to macroeconomic shifts, it may help regulators assess the relevance of banking-

sector resilience alongside monetary and fiscal interventions. For example, evidence on policy-rate and ROA associations may inform discussions of State Bank of Pakistan (SBP) policy. Similarly, the bank-specific estimates may inform managerial assessments of internal financial performance during periods of instability.

The main objective of this study is to examine the impact of post-2018 macroeconomic and bank-specific indicators on bank profitability in Pakistan. Specifically, the analysis assesses how economic downturns, currency devaluation, inflation, and reserve depletion relate to return on assets (ROA). It also examines how bank-internal factors such as size, capital adequacy, cash reserves, and spread ratio relate to profitability alongside external variables. By systematically exploring these relationships, the study contributes evidence to the understanding of the determinants of bank profitability in volatile emerging market contexts. Pakistan's evolving financial landscape provides the context for examining trends in bank profitability and ROA in relation to the post-2018 macroeconomic environment, using the State Bank of Pakistan data illustrated below.

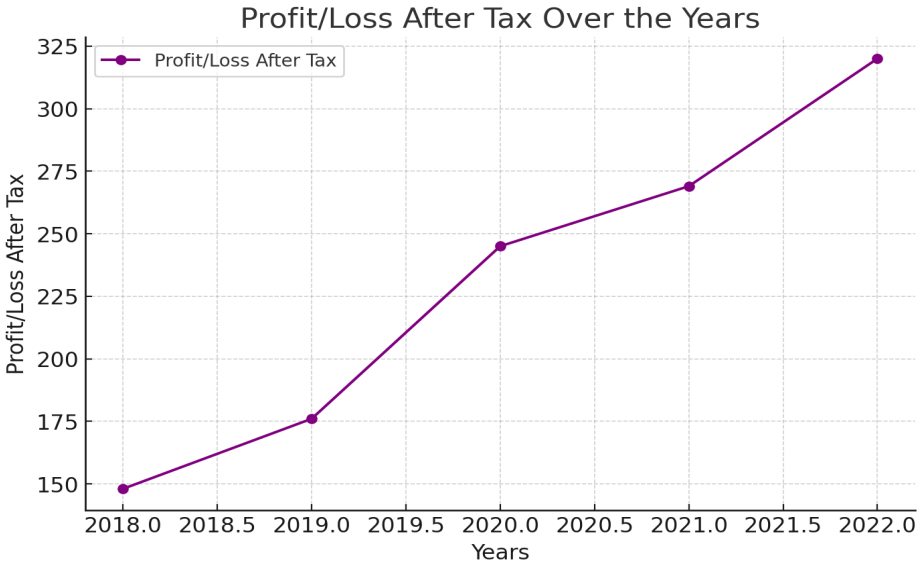


Figure 1: Trends in Profit/Loss After Tax in Pakistan's Banking Sector (2018–2022). Source: State Bank of Pakistan (SBP).

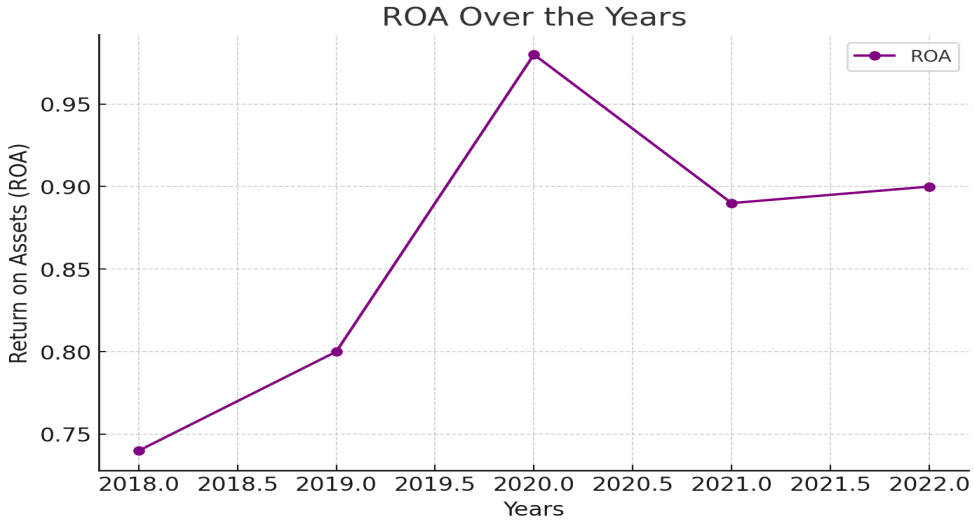


Figure 2: Trends in Return on Assets (ROA) in Pakistan's Banking Sector (2018–2022). Source: State Bank of Pakistan (SBP).

The remainder of the paper is structured as follows. Following this introduction, the literature review section reviews 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 reports descriptive, correlation, and regression analyses. The concluding section discusses their implications for policy and practice, and proposes directions for future research.

2. Literature Review and Hypotheses Development

Several theoretical perspectives help explain the profitability of banking institutions, particularly in Pakistan. The Structure-Conduct-Performance (SCP) framework and Relative Market Power (RMP) hypothesis emphasize how market structure and dominance shape bank profitability (Berger, 1995; O'Connell, 2022; Salike & Ao, 2016). The SCP framework posits that banks in highly concentrated markets may benefit from reduced competition, leading to higher spreads and profitability. Similarly, the RMP hypothesis suggests that banks with greater market power can offer unique products and influence pricing mechanisms. Efficiency-based perspectives offer an alternative explanation, 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). However, diseconomies of scale may emerge when growth introduces managerial complexity and inefficiencies. The Arbitrage Pricing Theory (Ross, 1976) and the Quantity Theory of Money (QTM) provide additional macroeconomic context; however, neither framework directly establishes the magnitude of bank-level profitability responses. These frameworks respectively propose that multiple macroeconomic variables affect returns on financial assets and that inflation is primarily influenced by changes in money supply (Saeed & Akhter, 2012). These theories provide a conceptual basis for assessing how internal and external indicators affect banking profitability. In Pakistan, they help assess how internal efficiencies and market positioning affect performance, particularly in a volatile macroeconomic context.

Empirical research identifies several bank-specific determinants of profitability, although the direction and strength of reported relationships differ across studies. Hassan and Bashir (2003) examine banks in a cross-country 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) focus 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 findings for the Pakistani setting are also discussed in the literature. Similarly, more recent evidence from Yuan et al. (2022) suggests that bank size, asset structure, and cost efficiency matter across the banks examined, with ROA positively correlated with size and negatively correlated with poor operational structure. Taken together, these studies indicate that internal decisions on asset management, capital allocation, and operational structure help explain bank profitability.

In Pakistan, Khan et al. (2015) show 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 emphasize the central role of bank-specific features in profitability, pointing to asset management quality and capital sufficiency. Raza et al. (2019) and Phillip (2020) conclude that financial metrics, especially capital strength and operational efficiency, remain key determinants of profitability. This aligns with Yuan et al. (2022), who find that the debt-to-asset ratio and loan-to-deposit ratio affect profitability across Asian banks. Therefore, the existing evidence suggests that internal structures—more than any single external shock—largely determine how banks weather volatility. Accordingly, the first hypothesis is proposed as follows: In addition, comparing capital, size, liquidity, and interest spreads provides a basis for evaluating competing efficiency and market-power explanations, although the present model does not directly test market concentration (Berger, 1995; O'Connell, 2022).

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

Complementing this perspective, macroeconomic conditions may also be associated with bank profitability. Drawing on Ross's Arbitrage Pricing Theory and the Quantity Theory of Money, the literature suggests that variables such as GDP, inflation, and interest rates are 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 show that fluctuations in macroeconomic indicators such as GDP, exchange rates, and aggregate demand are associated with banking performance in developed economies. Gul et al. (2011) report a positive relationship between inflation, interest rates, and profitability in Nigeria and Pakistan. Studies by Sharma and Mani (2012) and 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 effects, while inflation has mixed impacts. Osamwonyi and Michael (2014) in Nigeria note mixed effects of GDP and interest rates on ROA. Sheefeni (2015) also finds that interest rate volatility can dampen profitability, although inflation sometimes stimulates profitability, especially when moderate. Gikombo and Mbugua (2018) confirm exchange rate volatility and inflation as influential. Studies by Olokoyo et al. (2021) and De Leon (2020) reinforce that macroeconomic indicators such as inflation, GDP, interest rates, exchange rates, and foreign reserves affect profitability positively or negatively across diverse contexts. Recent research continues to confirm this ambivalence. Ajaz et al. (2022) find a weak correlation between the exchange rate and ROE for Pakistani banks. Al Sharif (2023), examining Jordanian Islamic banks, shows 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, Kelmendi (2024) uses panel data to confirm the significance of GDP, inflation, and exchange rate in shaping bank performance in Kosovo and Turkey. These findings suggest that macroeconomic stability may be relevant to 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, several empirical studies consider their joint association with profitability, 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) report that profitability is jointly associated 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 Wanzenried (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 Kirer-Silva-Lecuna (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 to show that market structure (an industry-specific variable), when combined with capital adequacy and inflation, is associated with profitability in the models studied. Thus, jointly considering these indicators is useful. Recent contributions by O'Connell (2022) and Bhattacharya et al. (2023) also consider technological transformation as an emerging industry-specific determinant. Issa et al. (2024) study Shariah-based banks and find that inefficiencies negatively affect profitability but that profitability is positively linked to macroeconomic resilience. These findings suggest the potential relevance of internal, external, and structural determinants of banking performance. However, joint estimation does not, by itself, demonstrate an interaction effect: an explicit interaction term is required to establish whether the response to a macroeconomic indicator varies with a particular bank characteristic.

3. Research Methodology

This study examines the profitability determinants of Pakistan's banking sector using bank-specific and macroeconomic indicators from 2018 to 2023. It focuses on commercial banks regulated by the State Bank of Pakistan (SBP). The stated sampling frame contains 42 licensed institutions across commercial, Islamic, specialized, and microfinance categories; these categories should be distinguished when interpreting the commercial-bank sample. The analysis includes 20 banks from the identified banking population. However, representativeness depends on the sampling frame and the actual selection procedure; therefore, the findings should be interpreted in relation to the banks and years observed. The 2018–2023 observation window offers at most six annual periods per bank; therefore, the interpretation of the findings should remain sensitive to the limited time dimension and any unbalanced observations.

The study uses Return on Assets (ROA) as the dependent variable, a commonly used measure of profitability in banking research. ROA, defined as net income divided by total assets, indicates earnings generated relative to a bank's assets. Prior studies have used it extensively, including Williams (2003), Bougatef (2017), and Haris et al. (2019). ROA is particularly relevant for assessing how effectively banks use their assets to generate earnings; however, alternative profitability measures can capture different aspects of financial performance (Williams, 2003; Bougatef, 2017). The independent variables are categorized into bank-specific and macroeconomic indicators. Table 1 presents the variables, operational definitions, and supporting references. Since EPS and ROA both incorporate net income, their association should also be interpreted with care, because the two ratios partly reflect the same underlying accounting result.

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 and Ashraf (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 and Ashraf (2012)

Source: By the author

Econometric Equation:

ROA it = α + β1*EPS_it* + *β2*SIZE_it + β3*CEQU_it* + *β4*SR_it + β5*CAR_it* + *β6*INF_it + β7*GDP_it* + *β8*EXR_it + β9*FXRV_it* + *β10*POLR_it + ε 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_{it} is the disturbance term representing variation not captured by the included regressors. The model tests the influence of various internal and external factors, within the same model, on the profitability of commercial banks operating in Pakistan's dynamic post-2018 environment. The specification includes bank-level and macroeconomic indicators and is estimated with pooled, fixed-effects, random-effects, and GMM approaches. However, including these estimators alone does not eliminate potential endogeneity or omitted-variable bias (Antonakis et al., 2010; Baltagi, 2005). Furthermore, Table 1 labels equity divided by total assets as the Capital Adequacy Ratio (CAR). This is an equity-to-assets measure and should be distinguished from the regulatory risk-weighted capital adequacy ratio when drawing regulatory implications.

The study employs a linear panel regression model and the Generalized Method of Moments (GMM) for the empirical analysis. The analysis first considers Pooled OLS, Fixed Effects, and Random Effects, with the Hausman test used to inform the choice between fixed- and random-effects specifications. Subsequently, Generalized Method of Moments (GMM) is used to address possible endogeneity, conditional on appropriate instrument choice and diagnostic validity (Zarrouk et al., 2016; Chowdhury & Rasid (2016); Zaefarian et al., 2017). As Antonakis et al. (2010) and Lim et al. (2023) emphasize, endogeneity arises when explanatory variables correlate with the error term, leading to biased estimates. GMM may address this concern if instrument selection and identifying assumptions are adequately justified (Baltagi, 2005; Roy et al., 2014). For a fully reproducible assessment, the selected endogenous variables, instruments, lag structure, instrument count, and relevant model diagnostics must be reported. These particulars cannot be inferred from the coefficient table alone.

4. Results and Analysis

4.1 Descriptive Statistics

The descriptive statistics for the variables used in this study describe variation in the profitability measures and explanatory indicators 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

Source: By the author

Return on Assets (ROA), with a mean of 0.973 and a median of 1.0, indicates a mean reported ROA of approximately 1%. The wide standard deviation of 0.923 and a range from -5.20 to 4.42 indicate a notable disparity in bank performance, showing considerable variation across banks. The manuscript identifies differences in performance between individual banks; however, the bank-specific comparisons should be supported by the underlying bank-level data. These differences warrant ofexaminingoth bank-specific characteristics and macroeconomic conditions. The reported GDP series has a mean of 5.826 and

a standard deviation of 0.072. However, its definition and scale should be distinguished from the GDP growth-rate proxy stated in Table 1 before interpreting this variation as economic steadiness.

4.2 Correlation Analysis

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

Source: By the author

However, the correlation between GDP and ROA is almost negligible (-0.0018), indicating little bivariate association in the reported sample, consistent with evidence reported by Sharma and Mani (2012) and Dodi and Arief (2018). In addition, inflation shows greater variability (SD = 9.898) and a modest positive correlation (0.2732) with ROA, which may reflect bank pricing responses during inflationary periods, although correlation does not establish that mechanism, as Perry (1992) notes. The Policy Rate (mean = 11.416; SD = 5.52) is positively correlated with ROA (0.2427), which could reflect changes in interest margins, although this mechanism is not directly tested. The exchange-rate series displays substantial variation (SD = 52.15), and its correlation with ROA (0.2776) does not, by itself, establish whether depreciation changes foreign-asset valuations or fee income.

Foreign Exchange Reserves (FXRV) show a weak negative correlation with ROA (-0.0920), suggesting minimal direct influence. EPS (mean = 9.885; SD = 10.849) shows a positive correlation with ROA (0.4468), indicating an association between two earnings-related performance measures. Spread Ratio (SR), with a mean of 4.88 and SD of 1.889, also shows a positive correlation with ROA (0.4533), which is consistent with the importance of interest margins. Capital Adequacy Ratio (CAR), with a mean of 16.586 and SD of 3.10, shows a positive correlation with ROA (0.4215), highlighting capital strength as a stabilizing factor for profitability. Bank Size (SZ) and Cash Equivalents (CEQU) show weaker but positive correlations (0.1831 and 0.1750, respectively), although these correlations do not establish that liquidity and scale cause improved profitability.

The correlation matrix also indicates associations among explanatory variables. Bank-specific factors EPS, SR, and CAR show positive correlations with ROA. Bank Size and CEQU show smaller positive associations, consistent with studies such as Khan and Ali (2016) and Sultan et al. (2020). Macroeconomic variables demonstrate mixed relationships. GDP again shows minimal impact, while Inflation, Policy Rate, and Exchange Rate show moderate, positive correlations, although potential transmission mechanisms are not tested directly. Inter-variable correlations, such as Inflation with Policy Rate (0.9277) and Exchange Rate with Inflation (0.9764), indicate substantial collinearity among macroeconomic variables. In addition, the reported correlation between SIZE and EPS (0.7279) suggests that shared variation among bank-specific indicators should be considered when interpreting their separate coefficients. The particularly high correlations among inflation, policy rate, and exchange rate likewise

warrant multicollinearity diagnostics. Because the macroeconomic series vary by year rather than bank, their identification depends principally on the limited number of observed years; therefore, coefficient uncertainty and collinearity deserve particular care.

4.3 Panel Regression Results

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	

Source: By the author. Note. * p < 0.10, ** p < 0.05, *** p < 0.01

The reported R-squared values for pooled OLS, fixed-effects, and random-effects models range from approximately 0.34 to 0.40; however, model-specific fit statistics should not be treated as directly interchangeable. EPS has a positive and statistically significant coefficient on ROA across all models, consistent with Khan, Kauser, and Abbas (2015). SR also has a positive estimated coefficient, especially in REM. Size, however, shows a negative association in OLS and REM, which may warrant further examination of possible diseconomies of scale. 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, are not statistically significant in the reported specifications, a pattern consistent with what Alper and Anbar (2011) and Ovamba (2014) noted. FX Reserves appear significant at the 10% level in REM, although the coefficient alone does not establish a stabilizing mechanism. The reported GMM coefficients offer an additional comparison, subject to instrument validity and specification. In addition, the adjusted R-squared reported for the fixed-effects model (0.7791) exceeds its reported R-squared (0.3867), which calls for checking the source output and the definition of the fit statistic before publication. This discrepancy is not resolved by the present interpretation.

Table 5: Model Results 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)			

*Source: By the author. Note. * $p < 0.10$ ** $p < 0.05$, *** $p < 0.01$*

4.4 Interpretation of Bank-Specific Factors

Regarding bank-specific indicators, the GMM results report statistically significant positive coefficients for CAR (shareholders' equity to total assets) and ROA in Pakistan's banks, consistent with stronger capitalization but not directly establishing 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 that high equity financing may reduce profitability because of cheaper alternatives. Bank size (SZ) shows a significant negative effect on ROA, although the observed relationship does not directly identify managerial inefficiencies, aligning with Khan et al. (2015), O'Connell (2022), and Bennaceur and Goaied (2008). 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. Similarly, the model reports a positive significant coefficient of Spread Ratio (SR) on ROA, which indicates a positive association between interest spreads and 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. In addition, the study reports a positive association between EPS and ROA, suggesting that higher earnings per share are associated with higher reported ROA, 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. Regarding cash equivalents, the study reports a positive but insignificant association between cash equivalents (CEQU) and ROA, although the model does not establish that liquidity has no effect on profitability, aligning with Chandra (2001) and Haron (2004). However, 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). Since the study does not report direct measures of non-performing loans or operating costs, the proposed credit-risk and efficiency mechanisms should be treated as explanations for future testing rather than established results (Ahamed, 2017; Esther et al., 2016).

4.5 Interpretation of Macroeconomic Indicators

Regarding macroeconomic indicators, the study reports an insignificant negative impact of GDP on bank profitability in Pakistan, aligning with Kelmendi (2024), Gazi et al. (2024), Sufian (2011), and Dodi and Arief (2018), who argue GDP growth does not necessarily lead to more 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 link between GDP and profitability. The model reports a positive but statistically 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. The policy rate also has a negative but statistically insignificant coefficient (POLR) and ROA, providing insufficient evidence of a nonzero association in this specification, consistent with Caliskan and Kirer-Silva-Lecuna (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. Similarly, the exchange rate has a negative but statistically insignificant coefficient in the GMM estimates, consistent with Olokoyo et al. (2021), Topak and Talu (2017), Hasanov et al. (2018), Sarwar et al. (2018), Adama and Togbenou (2017), Ovamba (2014), Ramadan et al. (2011), Rao and Lakew (2012), and Ongore and Kusa (2013). However, Davydenko (2010) and Akani et al. (2016) report a significant positive effect. Foreign exchange reserves (FXRV), by contrast, have a positive but statistically insignificant coefficient. Although the cited research does not provide a direct comparison 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. However, the simultaneous movement of inflation, policy rates, and exchange rates may make it difficult to identify separate macroeconomic effects in a short annual panel. The absence of conventional statistical significance should therefore be interpreted as limited evidence within the present specification, not proof of economic irrelevance.

4.6 Hypotheses and Empirical Findings

The reported GMM estimates indicate that, among the examined variables, bank-specific factors—namely Capital Adequacy Ratio (CAR), Spread Ratio (SR), and Earnings Per Share (EPS)—have statistically significant positive associations with ROA, while Cash Equivalents (CEQU) show a positive but insignificant relationship. Conversely, Firm Size (SZ) has a significant negative effect on ROA. These findings provide support for H1 in the reported GMM specification (Saeed, 2015; Yao et al., 2018; Javaid, 2016; Yuan et al., 2022). However, macroeconomic indicators—GDP, Exchange Rate, and Policy Rate—show insignificant negative associations with ROA, whereas Inflation and foreign exchange reserves show insignificant positive links. These results do not provide sufficient statistical support for Hypothesis H2 in the estimated sample; however, nonsignificance does not establish that macroeconomic variables have no effect on bank profitability in Pakistan, which can be considered alongside prior findings (Alper & Anbar, 2011; Sharma & Mani, 2012; Ovamba, 2014).

5. Conclusions and Recommendations

This study concludes that, in the reported specifications, the profitability of Pakistan's banking sector between 2018 and 2023 is more consistently associated with the selected bank-specific measures than with the included macroeconomic indicators. Among the ten explanatory variables examined—five macroeconomic and five bank-specific—Capital Adequacy Ratio (CAR), Spread Ratio (SR), and Earnings Per Share (EPS) have statistically significant positive coefficients on Return on Assets (ROA). These coefficients indicate positive associations between reported ROA and the measures of capitalization, interest spreads, and earnings per share. The results suggest comparatively clearer associations for selected bank-specific measures than for the included macroeconomic indicators within the observed sample; however, the estimates do not establish the underlying operational mechanisms. Firm size (SZ) has a statistically significant negative coefficient, which may motivate further examination of diseconomies of scale but does not identify their causes. Macroeconomic variables, including GDP, inflation, the policy rate, and the exchange rate, show statistically insignificant relationships with ROA, although the findings do not show that profitability is insulated from broader economic changes. Cash Equivalents (CEQU) and Foreign Exchange Reserves (FXRV) show positive but non-significant relationships, although the estimates do not rule out a broader role for liquidity or financial stability.

The findings are partly consistent with theoretical frameworks such as the Relative Market Power (RMP) hypothesis and Market Structure Theory. The positive coefficients for SR and EPS are compatible with aspects of the RMP premise that banks with strategic pricing and product power may be associated with higher returns. The positive coefficient on the reported capital measure is consistent with arguments emphasizing bank financial strength, although the relationship between capital strength, financial stability, and profitability is not directly examined. However, the negative association between size and ROA raises questions about simple scale-efficiency explanations, suggesting that expansion does not necessarily translate into efficiency or profitability. In addition, the statistically insignificant macroeconomic coefficients do not, by themselves, refute the Arbitrage Pricing Theory or the Quantity Theory of Money (QTM), which provide different explanations of how economic conditions may influence financial outcomes. Therefore, the results emphasize that for the Pakistani context, particularly in the post-2018 period marked by volatility, some bank-specific indicators show stronger estimated relationships with ROA than the macroeconomic variables included in the model. Similarly, the estimated size coefficient may motivate further assessment of diseconomies of scale, but identifying a particular management or bureaucratic channel would require additional operational measures (Berger, 1995; Kosmidou, 2008).

5.1 Implications for Bank Management

The findings have implications for bank management and regulatory discussion. To improve profitability, banks may prioritize internal optimization, beginning with enhancing their capital adequacy. Maintaining adequate capital buffers can support solvency; however, this study does not directly estimate risk-adjusted profitability. Strengthened governance and risk management frameworks support this goal and contribute to market credibility. Similarly, banks may review interest-rate pricing in light of the reported spread-ratio association. Banks should regularly assess their lending and deposit pricing strategies, consider scenario-based forecasting to evaluate monetary policy changes, and adjust portfolios to optimize returns. Diversifying into higher-margin lending sectors and offering tailored products to underserved markets can further support spread enhancement. In parallel, earnings performance may benefit from revenue diversification, cost optimization, digitalization, and sustainable earnings models. Transparent financial reporting, consistent dividend strategies, and innovation-driven business models may help support investor confidence.

5.2 Policy Implications

Regulatory frameworks may also need to respond to changing banking conditions. The State Bank of Pakistan could continue to evaluate capital adequacy and liquidity standards, stress-testing protocols, and oversight for digital platforms. Differentiated supervisory attention may help 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. In addition, sectoral diversification warrants consideration. Banks could 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 may broaden revenue opportunities and improve financial inclusion.

5.3 Limitations and Future Research

Future research could investigate the relationships between macroeconomic and bank-specific indicators 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 suitably specified dynamic panel models or other validated methods may identify relationships not captured by the present model. Comparative studies involving similar developing economies and mixed-method approaches, including interviews and case studies, may offer broader contextual understanding. Such evidence could help policymakers, regulators, and bank managers evaluate strategies for sustaining profitability and resilience in Pakistan's evolving

financial landscape. In addition, subsequent work could report alternative profitability outcomes such as return on equity and net interest margin, directly model non-performing loans and cost efficiency, and distinguish Islamic from conventional banks where the data permit. These extensions would help assess the stability and wider applicability of the present findings (Haris et al., 2019; Qayyum & Noreen, 2019).

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References

Abel, S., & Le Roux, P. (2016). An evaluation of the nexus between banking competition and efficiency in Zimbabwe. *Journal of Studies in Economics and Econometrics, 40*(3), 1–19.

Acaravcı, S. K., & Çalım, A. E. (2013). Turkish banking sector's profitability factors. *International Journal of Economics and Financial Issues, 3*(1), 27–41.

Adama, & Togbenou. (2017). The bank sector performance and macroeconomic environment: Empirical evidence in Togo. *International Journal of Economics and Finance, 9*(2), 180–188.

Adelopo, I., Lloydking, R., & Tauringana, V. (2017). Determinants of bank profitability before, during, and after financial crisis. *International Journal of Managerial Finance, 14*(4), 378–398.

Ahamed, M. M. (2017). Asset quality, non-interest income, and bank profitability: Evidence from Indian banks. *Economic Modeling, 63*, 1–14.

Ajaz, H., Ahmed, F., & Shehzadi, Y. (2022). Macroeconomic determinants of banks' performance in Pakistan. *International Journal of Experiential Learning & Case Studies, 7*(1), 56–74.

Akani, H., Nwanna, I., & Mbachu, A. (2016). Effects of selected macroeconomic variables on commercial banks' performance in Nigeria. *IIARD International Journal of Banking and Finance Research, 2*(1), 34–75.

Al Nimer, M., Warrad, L., & Al Omari, R. (2015). The impact of liquidity on Jordanian banks' profitability through return on assets. *European Journal of Business and Management, 7*(7), 229–232.

Al Sharif, B. M. M. (2023). The impact of macroeconomic variables on the performance of Islamic banks: An empirical study. *International Journal of Professional Business Review, 8*(4), 1-16.

Aladwan, M. (2015). The impact of bank size on profitability: An empirical study on listed Jordanian commercial banks. *European Scientific Journal, 11*(34), 217–236.

Al-Homaidi, E. A., Tabash, M. I., Farhan, N. H., & Almaqtari, F. A. (2018). Bank-specific and macro-economic determinants of profitability of Indian commercial banks: A panel data approach. *Cogent Economics & Finance, 6*(1), 1-26.

Allen, F., & Santomero, A. M. (2001). What do financial intermediaries do? *Journal of Banking & Finance, 25*(2), 271–294.

Alper, D., & Anbar, A. (2011). Bank-specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. *Business and Economics Research Journal, 2*(2), 139–152.

Ameer, B. (2013). Corporate governance: Issues and challenges in Pakistan. *International Journal of Academic Research in Business and Social Sciences, 3*(4), 79–88.

Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *The Leadership Quarterly, 21*(6), 1086–1120.

Antoun, R., Coskun, A., & Georgiezski, B. (2018). Determinants of financial performance of banks in Central and Eastern Europe. *Business and Economic Horizons, 14*(3), 513–529.

Ashraf, M., Haider, Z., & Sarwar, M. B. (2017). Bank-specific and macroeconomic determinants' impact on banks' profitability: Evidence from Asian countries. *International Journal of Sciences: Basic and Applied Research, 33*(3), 187–199.

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money, 18*(2), 121–136.

Babazadeh, M., & Farrokhnejad, F. (2012). Effects of short-run and long-run changes in foreign exchange rates on banks' profit. *International Journal of Business and Management, 7*(17), 191–200.

Badullahewage, S. U., & Jayewardenepura, C. (2018). The effects of macroeconomic factors on the performance of stock market in Sri Lanka. *International Journal of Innovation and Economic Development, 3*(6), 33–41.

Baksay, G., Karvalits, F., & Kuti, Z. (2012). The impact of public debt on foreign exchange reserves and central bank profitability: The case of Hungary. *BIS Papers, 67*, 179–191.

Baltagi, B. H. (2005). *Econometric analysis of panel data*. New York, NY: Wiley.

Bashir, A.-H. M. (2003). Determinants of profitability in Islamic banks: Some evidence from the Middle East. *Islamic Economic Studies, 11*(1), 32–57.

Bennaceur, S., & Goaied, M. (2008). The determinants of commercial bank interest margin and profitability: Evidence from Tunisia. *SSRN Electronic Journal*.

Berger, A. N. (1995). The relationship between capital and earnings in banking. *Journal of Money, Credit and Banking, 27*(2), 432–456.

Bhattacharya, T., Das, S., & Basu, R. (2023). Financial innovation and bank performance: An empirical analysis of Indian commercial banks. *International Journal of Business Innovation and Research, 31*(4), 515–541.

Bilal, M., Saeed, A., Gull, A. A., & Akram, T. (2013). Influence of bank-specific and macroeconomic factors on profitability of commercial banks: A case study of Pakistan. *Research Journal of Finance and Accounting, 4*(2), 117–126.

Bougatef, K. (2017). Determinants of bank profitability in Tunisia: Does corruption matter? *Journal of Money Laundering Control, 20*(1), 70–78.

Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking & Finance, 13*(1), 65–79.

Bouzgarrou, H., Jouida, S., & Louhichi, W. (2018). Bank profitability during and before the financial crisis: Domestic versus foreign banks. *Research in International Business and Finance, 44*, 26–39.

Caliskan, M. M. T., & Kirer-Silva-Lecuna, H. (2020). The determinants of banking sector profitability in Turkey. *Business and Economics Research Journal, 11*(1), 161–167.

Chandra, P. (2001). *Financial management* (7th ed.). New York, NY: McGraw-Hill.

Chowdhury, M. A. F., & Rasid, M. E. S. M. (2016). Determinants of performance of Islamic banks in GCC countries: Dynamic GMM approach. *In Advances in Islamic finance, marketing, and management: An Asian perspective* (pp. 49–80). Emerald Group Publishing.

Curak, M., Poposki, K., & Pepur, S. (2012). Profitability determinants of the Macedonian banking sector in changing environment. *Procedia – Social and Behavioral Sciences, 44*, 406–416.

Davydenko, A. (2010). Determinants of bank profitability in Ukraine. *Undergraduate Economic Review, 7*(1), 1–30.

De Leon, M. (2020). The impact of credit risk and macroeconomic factors on profitability: The case of the ASEAN banks. *Banks and Bank Systems, 15*(1), 21–29.

Dietrich, A., & Wanzenried, G. (2009). What determines the profitability of commercial banks? New evidence from Switzerland. In *12th conference of the Swiss society for financial market researches, Geneva* (Vol. 2, p. 39).

Dodi, Supiyadi, & Arief, D. (2018). Islamic bank profitability: A study of Islamic banks in Indonesia. *The International Journal of Business Review, 1*(1), 51–60.

Dominguez, K. M., Hashimoto, Y., & Ito, T. (2012). International reserves and the global financial crisis. *Journal of International Economics, 88*(2), 388–406.

Djalilov, K., & Piesse, J. (2016). Determinants of bank profitability in transition countries: What matters most? *Research in International Business and Finance, 38*, 69–82.

Ennis, H. M., Fessenden, H., & Walter, J. R. (2016). Do net interest margins and interest rates move together? *Federal Reserve Bank of Richmond*.

Esther, L., Ntow-Gyamfi, M., & Alu, A. A. (2016). Nonperforming loans and bank profitability: Evidence from an emerging market. *African Journal of Economic and Management Studies, 7*(4), 462–481.

Farooq, M., Khan, S., Siddiqui, A. A., Khan, M. T., & Khan, M. K. (2021). Determinants of profitability: A case of commercial banks in Pakistan. *Humanities and Social Sciences Reviews, 9*(2), 1–13.

Gazi, M. A. I., Alam, M. A., Hossain, G. A., Alam, S., Rahman, M. K., Nahid, M. N., & Hossain, A. I. (2021). Determinants of profitability in the banking sector: Empirical evidence from Bangladesh. *Universal Journal of Accounting and Finance, 9*(6), 1377–1386.

Gazi, M. A. I., Karim, R., Senathirajah, A. R. B. S., Ullah, A. M. M., Afrin, K. H., & Nahiduzzaman, M. (2024). Bank-specific and macroeconomic determinants of profitability of Islamic Shariah-based banks: Evidence from a new economic horizon using panel data. *Economies, 12*(3), 1-18.

Gerlach, S., Peng, W., & Shu, C. (2005). Macroeconomic conditions and banking performance in Hong Kong SAR: A panel data study. *BIS Papers, 22*. Retrieved from: https://www.bis.org/publ/bppdf/bispap22x.pdf

Gikombo, E. M., & Mbugua, D. (2018). Effect of select macroeconomic variables on performance of listed commercial banks in Kenya. *International Academic Journal of Economics and Finance, 3*(1), 80–109.

Gul, S., Irshad, F., & Zaman, K. (2011). Factors affecting bank profitability in Pakistan. *The Romanian Economic Journal, 39*, 60–87.

Haris, M., Yao, H., Tariq, G., Malik, A., & Javaid, H. M. (2019). Intellectual capital performance and profitability of banks: Evidence from Pakistan. *Journal of Risk and Financial Management, 12*(2), 1-26.

Haron, S. (1996). Competition and other external determinants of the profitability of Islamic banks. *Islamic Economic Studies, 4*(1), 49–66.

Haron, S. (2004). Determinants of Islamic bank profitability. *Global Journal of Finance and Economics, 1*(1), 11–33.

Hasanov, F. J., Bayramli, N., & Al-Musehel, N. (2018). Bank-specific and macroeconomic determinants of bank profitability: Evidence from an oil-dependent economy. *International Journal of Financial Studies, 6*(4), 1-21.

Hassan, M. K., & Bashir, A. H. M. (2003, December). Determinants of Islamic banking profitability. In *10th ERF Annual Conference, Morocco* (Vol. 7, pp. 2–31).

Hoffmann, P. S. (2011). Determinants of the profitability of the US banking industry. *International Journal of Business and Social Science, 2*(22), 225–269.

Idris, A. R., Asari, F. F. A. H., Taufik, N. A. A. A., Salim, N. J., Mustaffa, R., & Jusoff, K. (2011). Determinants of Islamic banking institutions' profitability in Malaysia. *World Applied Sciences Journal, 12*(1), 1–7.

Iskandar, A. S., Che-Yahya, N., & Ab Wahid, Z. (2019). Determinants of commercial banks' profitability in Malaysia. *Journal of Entrepreneurship & Business, 7*(1), 1–10.

Jahan, N., & Abdullah, M. N. (2014). The impact of liquidity on profitability in the banking sector of Bangladesh: A case of Chittagong Stock Exchange. *EPRA International Journal of Economic and Business Review, 2*(10), 17–22.

Javaid, M. E. (2016). Bank-specific and macroeconomic determinants of bank profitability. *Journal of Management Info, 3*(1), 14–18.

Javaid, S., Anwar, J., Zaman, K., & Ghafoor, A. (2011). Determinants of bank profitability in Pakistan: Internal factor analysis. *Journal of Yasar University, 6*(23), 3794–3804.

Jeon, Y., & Miller, S. M. (2005). Bank performance: Market power or efficient structure? *Economics Working Papers, 1*, 1–26.

Kamran, H. W., Johnson, Z., & Sammer, M. (2016). Determinants of profitability in the banking sector. *International Journal of Information Research and Review, 3*(5), 2258–2264.

Kanwal, S., & Nadeem, M. (2013). The impact of macroeconomic variables on the profitability of listed commercial banks in Pakistan. *European Journal of Business and Social Sciences, 2*(9), 186–201.

Kelmendi, V. (2024). Impact of macroeconomic factors on bank financial performance: A Turkey and Kosovo comparative study. *International Journal of Sustainable Development & Planning, 19*(1), 1–12.

Khan, Q. M., Kauser, R., & Abbas, U. (2015). Impact of bank-specific and macroeconomic factors on banks' profitability: A study on banking sector of Pakistan. *Journal of Accounting and Finance in Emerging Economies, 1*(2), 99–110.

Khan, R. A., & Ali, M. (2016). Impact of liquidity on profitability of commercial banks in Pakistan: An analysis on banking sector in Pakistan. *Global Journal of Management and Business Research, 16*(1), 53–59.

Khan, W. A., & Sattar, A. (2014). Impact of interest rate changes on the profitability of four major commercial banks in Pakistan. *International Journal of Accounting and Financial Reporting, 4*(1), 142–158.

Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. *Managerial Finance, 34*(3), 146–159.

Lim, D. T., Khang, W. G., Yee, W. S., Khairunnisa, M., & Sharmila, T. (2023). Estimation of stock market index volatility using the GARCH model: Causality between stock indices. *Asian Economic and Financial Review, 13*(2), 162–179.

Masood, O., & Ashraf, M. (2012). Bank-specific and macroeconomic profitability determinants of Islamic banks: The case of different countries. *Qualitative Research in Financial Markets, 4*(2/3), 255–268.

Marimuthu, M. (2008). Ethnic diversity on boards of directors and its implications on firm financial performance. *Journal of International Social Research, 1*(4), 431–445.

Molyneux, P., & Thornton, J. (1992). Determinants of European bank profitability: A note. *Journal of Banking & Finance, 16*(6), 1173–1178.

Mule, K. R., Mukras, M. S., & Nzioka, O. M. (2015). Corporate size, profitability and market value: An econometric panel analysis of listed firms in Kenya. *European Journal of Business and Management, 7*(7), 222–230.

Nazir, Y., Hussain, F. Z., Mukhtar, A., & Khalid, S. (2022). The impact of firm-specific factors on the stock prices: New insight from emerging market of Asia. *Journal of Accounting and Finance in Emerging Economies, 8*(1), 101–112.

Nisar, S., Peng, K., Wang, S., & Ahmed, J. (2017). Banking sector profitability before, during and after global financial crisis: Evidence from a developing economy. *International Journal of Finance & Banking Studies, 6*(3), 22–38.

Nolle, D. E., Barth, J. R., & Rice, T. N. (1997). Commercial banking structure, regulation, and performance: An international comparison. *Managerial Finance, 23*(11), 1–39.

O'Connell, M. (2022). Bank-specific, industry-specific and macroeconomic determinants of bank profitability: Evidence from the UK. *Studies in Economics and Finance, 40*(1), 155–174.

Olokoyo, F. O., Ibhagui, O. W., & Babajide, A. (2021). The impact of macroeconomic variables on bank performance in Nigeria. *Savings and Development, 43*, 31–47

Ongore, V. O., & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. *International Journal of Economics and Financial Issues, 3*(1), 237–252.

Osamwonyi, I. O., & Michael, C. I. (2014). The impact of macroeconomic variables on the profitability of listed commercial banks in Nigeria. *European Journal of Accounting Auditing and Finance Research, 2*(10), 85–95.

Ovamba, E. K. (2014). Effect of macroeconomic factors on commercial banks' profitability in Kenya: Case of Equity Bank Limited. *Journal of Economics and Sustainable Development, 5*(2), 46-56.

Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance, 21*(2), 222–237.

Paul, S. C., Bhowmik, P. K., & Famanna, M. N. (2021). Impact of liquidity on profitability: A study on the commercial banks in Bangladesh. *Advances in Management and Applied Economics, 11*(1), 73–90.

Perry, P. (1992). Do banks gain or lose from inflation? *Journal of Retail Banking, 14*(2), 25–30.

Phillip, T. G. (2020). Banking sector profitability through investigation of financial performance indicators: The case of Zimbabwe. *IOSR Journal of Business and Management, 22*(7), 22–30.

Qayyum, N., & Noreen, U. (2019). Impact of capital structure on profitability: A comparative study of Islamic and conventional banks of Pakistan. *Journal of Asian Finance, Economics and Business, 6*(4), 65–74.

Rahman, H. U., Yousaf, M. W., & Tabassum, N. (2020). Bank-specific and macroeconomic determinants of profitability: A revisit of Pakistani banking sector under dynamic panel data approach. *International Journal of Financial Studies, 8*(3), 1-19.

Ramadan, I. Z., Kilani, Q. A., & Kaddumi, T. A. (2011). Determinants of bank profitability: Evidence from Jordan. *International Journal of Academic Research, 3*(4), 180–191.

Raza, H., Saeed, A., & Hena, S. (2019). Determinants of profitability in banking sector: An evidence from Pakistan. *European Scientific Journal, 15*(7), 35–48.

Ross, S. (1976). The arbitrage pricing theory. *Journal of Economic Theory, 13*(3), 341–360.

Saeed, M. S. (2015). Bank-related, industry-related and macroeconomic factors affecting bank profitability: A case of the United Kingdom. *Journal of Emerging Issues in Economics, Finance and Banking, 4*(1), 123–140.

Saeed, S., & Akhter, N. (2012). Impact of macroeconomic factors on banking index in Pakistan. *Interdisciplinary Journal of Contemporary Research in Business, 4*(6), 1200–1218.

Salike, N., & Ao, B. (2016). Determinants of banks' profitability: Role of poor asset quality in Asia. *Economic Journal of Emerging Markets, 8*(2), 216–231.

Samad, A. (2004). Performance of interest-free Islamic banks vis-à-vis interest-based conventional banks of Bahrain. *International Journal of Economics, Management and Accounting, 12*(2), 1–15.

Saona, P. (2016). Intra- and extra-bank determinants of Latin American banks' profitability. *International Review of Economics & Finance*, 45**,** 197–214.

Sarwar, B., Mustafa, G., & Abid, A. (2018). Internal and external determinants of profitability: A case of commercial banks of Pakistan. *Paradigms, 12*(1), 38–43.

Scholtens, B., & Van Wensveen, D. (2000). A critique on the theory of financial intermediation. *Journal of Banking & Finance, 24*(8), 1243–1251.

Seven, Ü., & Yetkiner, H. (2016). Financial intermediation and economic growth: Does income matter? *Economic Systems, 40*(1), 39–58.

Sharma, E., & Mani, M. (2012). Impact of macroeconomic and financial market indicators on the banking sector: Some evidence from India. *International Journal of Research in Finance & Marketing, 2*(2), 171–185.

Sheefeni, J. P. S. (2015). The macroeconomic determinants of profitability among commercial banks in Namibia. *Journal of Emerging Issues in Economics, Finance & Banking, 4*(1). 1414-1431.

Smirlock, M. (1985). Evidence on the (non) relationship between concentration and profitability in banking. *Journal of Money, Credit and Banking, 17*(1), 69–83.

Staikouras, C. K., & Wood, G. E. (2011). The determinants of European bank profitability. *International Business & Economics Research Journal, 3*(6), 57-61.

Sufian, F. (2011). Profitability of the Korean banking sector: Panel evidence on bank-specific and macroeconomic determinants. *Journal of Economics and Management, 7*(1), 43–72.

Sultan, K., Ahmed, R. R., Ameen, F. M., & Singh, M. (2020). The effect of macroeconomic and bank-specific factors on banks' profitability: Empirical evidence from banking industry of Pakistan. *Humanities & Social Sciences Reviews, 8*(3), 635–645.

Tan, Y. (2016). The impacts of risk and competition on bank profitability in China. *Journal of International Financial Markets, Institutions & Money, 40*, 85–110.

Topak, M. S., & Talu, N. H. (2017). Bank-specific and macroeconomic determinants of bank profitability: Evidence from Turkey. *International Journal of Economics and Financial Issues, 7*(2), 574–584.

Wadood, A., Khan, M. T., Saleem, F., & Shahzad, S. (2020). Factors affecting bank profitability in Pakistan. *Journal of Business & Tourism, 6*(1), 409–419.

Wasiuzzaman, S., & Tarmizi, H.-A. A. (2010). Profitability of Islamic banks in Malaysia: An empirical analysis. *Journal of Islamic Economics, Banking and Finance, 6*(4), 53–68.

Williams, B. (2003). Domestic and international determinants of bank profits: Foreign banks in Australia. *Journal of Banking & Finance, 27*, 1185–1210.

Yao, H., Haris, M., & Tariq, G. (2018). Profitability determinants of financial institutions: Evidence from banks in Pakistan. *International Journal of Financial Studies, 6*(2), 1-28.

Yuan, D., Gazi, M. A. I., Harymawan, I., Dhar, B. K., & Hossain, A. I. (2022). Profitability determining factors of banking sector: Panel data analysis of commercial banks in South Asian countries. *Frontiers in Psychology, 13*, 1-17.

Zaefarian, G., Kadile, V., Henneberg, S. C., & Leischnig, A. (2017). Endogeneity bias in marketing research: Problem, causes and remedies. *Industrial Marketing Management, 65*, 39–46.

Zarrouk, H., Ben Jedidia, K., & Moualhi, M. (2016). Is Islamic bank profitability driven by same forces as conventional banks? *International Journal of Islamic and Middle Eastern Finance and Management, 9*(1), 46–66.

Zopounidis, C., & Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. *Managerial Finance*, *34*(3), 146–159.