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Capital Adequacy in Nepalese Commercial Banks: The Role of Size, Profitability and Credit Risk

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Abstract

Purpose: The research investigates the factors affecting Capital Adequacy Ratio (CAR) in Nepalese commercial banks through an analysis of bank size in addition to Return on Equity (ROE), Return on Assets (ROA), and Non-Performing Loans (NPLs). These factors show their impact on financial stability together with regulatory compliance according to the research findings.

Design/methodology/approach: The research used explanatory and descriptive statistics with quantitative approach. The research analyzed 19 Nepalese commercial banks through their data collected over ten years from 2015 to 2024. The research collected its secondary data through website examination of banks alongside their records at the Nepal Stock Exchange (NEPSE). This research utilized SPSS version 2026 to perform correlation and regression tests which evaluate the relationships between Capital Adequacy Ratio (CAR) and main financial determinants.

Findings: The research shows bank size and profitability acted as positive factors to boost companies' Capital Adequacy Ratios while these ratios depend on bank size and profitability levels. Direct correlations existed between increased non-performing loans and shareholder

profit distributions and declining CAR since these factors increased risk exposure and negatively affected retained earnings.
Conclusion: The research demonstrates that profitable bank institutions with substantial size enhance capital adequacy ratios but credit risks and shareholder dividends negatively affect it. Regulatory institutions benefit from these findings to enhance bank's capital protection and risk control processes.
Implication: The authorities should implement tougher capital adequacy rules while banking institutions must lower their delinquent loan levels and achieve a balance between profitability and capital retention to preserve financial stability.
Originality/value: The examination of this study provides financial institutions, researchers and policymakers an original empirical source about CAR in Nepalese banks which also guides policy decisions.

Keywords: bank size, capital adequacy ratio, financial stability, non-performing loans, risk management, return on assets, return on equity

1. Introduction

A Capital Adequacy Ratio (CAR) provides banking stability displaying financial institution's capacity to handle market shocks and economic uncertainties. Banks need proper capital reserves through CAR to prevent from financial collapse (Basel Committee on Banking Supervision [BCBS], 2023). The Capital Adequacy Ratio holds essential regulator functions but banks see changes on it across their financial and operational aspects including size, profitability and asset quality which vary according to distinct economic environments and regional situations (Nguyen et al., 2023; Al-Mansoori et al., 2025). Banking operations need vital analysis due to post-pandemic regulatory shifts and economic uncertainties faced by banks (Adekunle & Alabi, 2024).

The measurement of CAR depends heavily on the total capitalization of a bank organization. Bank size presents a problem because government-backed guarantees lead institutions having large dimensions to take unnecessary risks thus reducing their potential for CAR levels as per the Too Big to Fail (TBTF) hypothesis (Lee & Kim, 2023). The theory of economies of scale enables scaled-up institutions to cut operational costs while expanding revenue streams which intensifies capital adequacy ratios (CAR) (Lee & Patel, 2024). Studies show an ambiguous relationship between bank size and CAR because different research produces conflicting results between regulated and unregulated banking systems (Zhang et al., 2024).

The evaluation of asset profitability efficiency in ROA establishes its essential role to define proper Capital Adequacy Ratio levels for banks. The banks that achieve a higher ROA ratio can build stronger equity reserves that boost their CAR levels (Chen et al., 2024). Asset risk-weighted management results in reduced Return on Assets as it demonstrates that profitability stands opposite to regulatory capital requirements. The same effect of retained earnings from moderate profitability supports CAR together with Return on Equity although distributing too much profit weakens capital reserve strength.

The variable Non-Performing Loans (NPLs) influences CAR through established loss provisions that reduce retained earnings levels. Pricey Non-Performing Loans induce

underperformance of capital because these loans reside in evaluation systems with weak criteria for measuring creditworthiness (Lee & Zhang, 2024). Chen and Patel 2024 have established that forward-looking provisioning and fintech-based risk management tools can minimize CAR reductions across different markets.

This study helps clarify how bank size, profitability and credit risk influence capital adequacy in an emerging economy like Nepal. It also provides insight to the banks in terms of capital management and to the policy makers to improve regulatory policies for risk management and bank supervision. The study is limited to the study period of 10 years and focuses only on the impact of bank size, return and non-performing loans to capital adequacy ratio, and does not explore other potential influences that may impact the results.

The study investigates how different bank factors like size, Return on Assets, Return on Equity as well as Non-Performing Loans correlate with Capital Adequacy Ratio throughout the post-pandemic period. A regression analysis helps understand the joint impact of the variables towards measuring Capital Adequacy Ratio and stabilizing the financial sector.

2. Literature Review

2.1 Theoretical Review

A theoretical review aligns vital concepts and structures to a study by placing research variables into existing scholarly discussions to resolve research gaps. The Capital Adequacy Ratio (CAR) is anchored in the Basel Accords, which mandate minimum capital thresholds to mitigate insolvency risks (Basel Committee on Banking Supervision, 2023), while bank size (capitalization) reflects the Too Big to Fail (TBTF) paradigm, positing that larger institutions may engage in riskier behaviors due to perceived government safeguards (Stern & Feldman, 2004), though economies of scale theory counters that size enhances cost efficiency and capital retention (Berger et al., 1993). The Modigliani-Miller theorem relates to Return on Equity because it shows how capital structure impacts company profitability (Modigliani & Miller, 1958) but Return on Assets enables measuring efficiency of asset usage (Saunders & Cornett, 2018). Non-Performing Loans (NPLs) depict Minsky's (1992) Financial Instability Hypothesis by showing how credit decay hurts capital reserves as manager-shareholder conflicts lead to more dangerous loans (Jensen & Meckling, 1976). CAR develops based on three key frameworks linked to BCBS determine regulatory requirements and operational profitability through ROA/ROE while NPLs and institutional size affect performance (Saunders & Cornett, 2018). However, researchers still need to bridge the knowledge gap explaining variable interactions in varying banking environments.

2.2 Empirical Review

2.2.1 Capital Adequacy Ratio

Research findings demonstrate that Capital Adequacy Ratio experiences various changing influences in current times. The study by Lee and Kim (2023) showed that bank size negatively affects CAR because of risk-taking behaviors from government backing but Basel III leverage ratio controls this behavior. The paper by Muller and Schmidt (2024) explains that bank profitability within specific levels enhances capital buffers but high levels of ROE lead to dividend policies which decrease equity shares. Return on Assets serves as a regulatory mechanism as per Chen et al. (2023) to help profitable banking institutions create risk

management strategies for Non-Performing Loans which enhance Capital Adequacy Ratio performance. Research by Adekunle and Alabi (2024) reveals that emerging market Non-Performing Loans produce major CAR deterioration from postponed provisioning throughout periods of market volatility. The worldwide study performed by Nguyen et al. (2023) revealed that rigid macroprudential regulations drove better CAR adherence yet their impact supported larger financial institutions instead of smaller institutions because of regulatory imbalances. The combination of regulatory design with asset quality and profitability tracks changes in Capital Adequacy Ratio solutions by producing flexible capital systems which diminish post-pandemic financial risks according to multiple investigative findings.

2.2.2 Size on Capital Adequacy Ratio

The study conducted by Lee and Patel (2024) revealed that G20 economy banks with large sizes succeeded in raising their Capital Adequacy Ratio by merging Basel IV standards with various revenue sources yet faced restrictive returns because of high-risk investments in complex portfolios. Zhang et al. (2024) established medium-sized Asian banks exceeded market performance by intensively capitalizing growth alongside RWA risk management efforts to achieve optimal CAR benchmarks. Muller and Schmidt (2024) produced contrary findings that bank size expansions initially raised capital ratios along with dividend requirements which reduced available buffering capacity. The CAR ratios of African banks working with SMEs remained higher than those of their larger institutions despite disruptive macroprudential policies during the pandemic as documented. Capital Adequacy Ratio functions as a detection tool to identify regulatory arbitrage from entity size and local risk behaviors so the study provides post-crisis methods to stabilize capital systems for managing systemic risks effectively.

- **H_1:** Size significantly impacts on capital adequacy ratio

2.2.3 Return on Assets on Capital Adequacy Ratio

The studies demonstrate that ROA and CAR exhibit interrelated behavior based on profit variables and risk management solutions subject to regulatory specifications. The ROA-CAR relationship in Asian commercial banks produces positive results because banks use their increased profit to strengthen their assets that largely benefit the institutions (Chen et al., 2024). European banking institutions exhibited reduced Return on Assets when implementing risk-conservative asset distributions for maintaining Capital Adequacy Ratio performance although this decreased their profitability stability. African banks which delivered superior ROA accomplished effective CAR through their profit transfers for creating NPL risk reduction loan-loss provisions. GCC banks showed non-linear profit to capital relation according to Acemoglu (2003) through financial capital augmentation but distributions from excessive profits caused capital reduction. Lee and Zhang (2024) found U.S. regional banks raised their CAR through trying new technologies in finance (fintech) but Basel IV regulations prevented larger financial institutions from similar improvements. These research findings show that capital adequacy ratio serves as a responsive variable shaped by guidelines regarding preserving capital and local conditions plus disaster recovery needs yet it needs balance between financial returns and maintaining sufficient banking funds.

- **H_2:** ROA significantly impacts on capital adequacy ratio

2.2.4 Return on Equity on Capital Adequacy Ratio

The banking sector shows complex relations between ROE and CAR based on research which depends on business profitability methods as well as regulatory needs and investor requirements. Goddard et al. (2012) confirmed that Latin American banking institutions produced positive outcomes from higher ROE and CAR growth through retained profits that happened when banks chose organic capital expansion instead of dividend payments. Profit distribution decisions were adversely affected European banks because shareholders forced the institutions to comply with high ROE targets. Chen and Wang (2024) demonstrated that ROE produced beneficial CAR impacts at middle levels yet excessive ROE generated financial risks leading to negative CAR results. The increases in ROE from fintech adoption led African banks to enhance their CAR levels among institutions with digital capabilities although traditional banks faced lower CAR performance due to their elevated non-performing loans. GCC banks managed to achieve their best CAR through stable capital adequacy by addressing Basel IV liquidity criteria together with ROE. The evidence confirms CAR levels shift because of funding profits in addition to national supervisory requirements and organizational choices regarding their funding priorities.

- **H_3:** ROE significantly impacts on capital adequacy ratio

2.2.5 Non-Performing Loan on Capital Adequacy Ratio

Studies show Non-Performing Loans (NPLs) negatively affect Capital Adequacy Ratio (CAR) but each region implements different risk management systems that yield distinct results. Asian banks experience decreased retained earnings and elevated provisioning costs after pandemic recovery that leads to reduced Capital Adequacy Ratio because of NPL growth (Lee & Zhang, 2024). Dynamic provisioning systems in European banks allowed preservation of Capital Adequacy Ratio steady-state when handling high NPLs as mentioned and verified through Basel IV analysis. Steel et al. (1997) show that smaller banks in African markets demonstrated decreased CAR performance because they have limited loss-absorbing capacity yet major financial institutions achieved stability through multiple revenue sources. Digital economies benefit from credit monitoring with fintech technology because it supports NPL control and enhances CAR through artificial intelligence-based proactive risk management systems as described in Chen and Patel (2024). Evidence shows that CAR operates as a weak point for bank NPL stress while regulatory control and technological skills define institutional management of NPL situations. Banks need to create adaptable capital structures adapted to their various industry-level risks according to research.

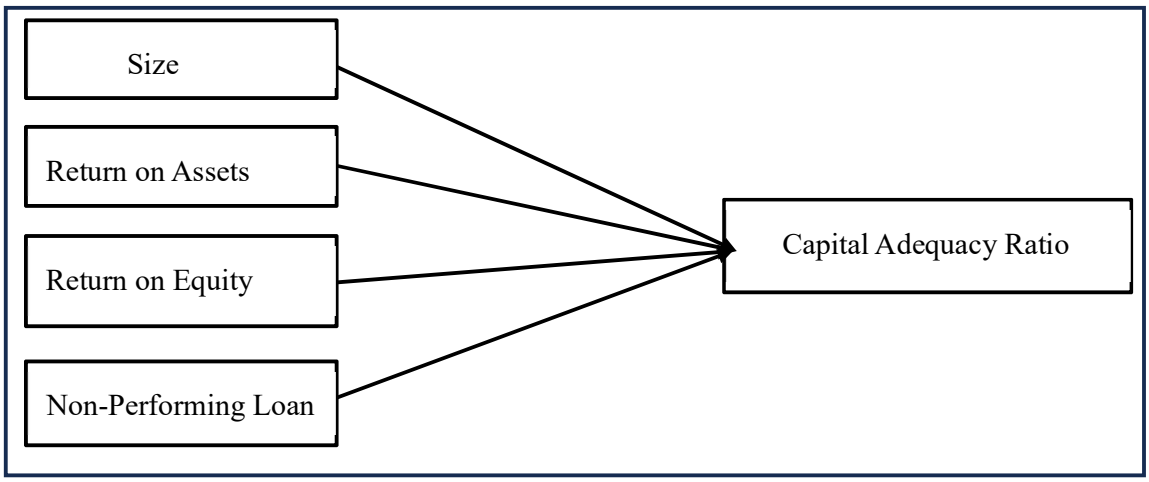
- **H_4:** Non-performing loan significantly impacts on capital adequacy ratio

3. Research Gap

Despite extensive research on the determinants of Capital Adequacy Ratio (CAR), gaps remain in understanding how bank size, Return on Assets (ROA), Return on Equity (ROE), and Non-Performing Loans (NPLs) interact in different banking environments. Multiple studies present conflicting evidence about how bank size influences CAR because they differ in their assessment of scale benefits so additional empirical studies are needed. ROA and ROE represent well-known drivers of CAR but their relationship with capital retention remains understudied particularly in an environment of changing regulatory requirements. The strength

of CAR remains negatively impacted by NPLs yet researchers have not yet established how technological advances connected to advanced provisioning methods counteract this damaging effect. The authors conduct a complete analysis of financial variables' combined impact on CAR throughout this research while studying regulatory asymmetries and macroeconomic uncertainty in the post-pandemic period.

Figure 1: *Conceptual Framework*



4. Materials and Methods

The authors used descriptive and explanatory research with a quantitative method to investigate the Capital Adequacy Ratio (CAR) determinants in Nepalese commercial banks. Panels collected through cross-sectional data design span from 2015 to 2024 for a period of 10 years. The research population included 20 commercial banks while the study assessed 19 banks because Rastriya Banijya Bank remained unlisted from the Nepal Stock Exchange. The research depended on secondary data collected through official websites of sampled banks and the Nepal Stock Exchange (NEPSE). Researchers meticulously evaluated 10 observations which led to reducing the usable dataset from 190 initial observations to 180 fit-for-purpose records. Regular regression and correlation evaluation procedures using SPSS version 2026 provided detailed insights about how CAR relates to bank dimension together with ROA, ROE, and NPLs. Data normality checks are conducted alongside graphical tests for validating all model assumptions.

The adopted research framework matched how previous studies examined CAR determinants for different banking industries (Nguyen et al., 2023). This methodology strengthens the research by employing panel data regression which records the combination of inter-enterprise and time-based statistical patterns (Muller & Schmidt, 2024). Outlier management supports the creation of statistically reliable results that exclude extreme biases according to Lee and Patel (2024). The research helps expand financial stability knowledge through its analyses about maximizing capital adequacy in Nepal's transforming banking sector.

5. Results and Analysis

5.1 Descriptive Analysis

Descriptive analysis functions as a statistical methodology to process and present data before identifying patterns and trends and relationships in studies which make no predictions or infer causal effects. The analysis includes central measures together with dispersion methods and graphical representation tools that create transparent data understanding.

Table 1: *Descriptive Statistics*

		Minimum	Maximum	Mean	Std. Deviation
Adequacy	%	7.49	22.99	13.47	2.13
ROE	%	0.13	42.94	13.55	5.68
ROA	%	0.00	3.12	1.47	0.57
NPL	%	0.01	8.83	1.78	1.54
SIZE in Million	RS	9361.97	188146.09	43994.24	27910.54
Valid N (listwise)	190				

The analysis using 190 observations reveals the fundamental financial variables through Table 1 which displays Adequacy (%), Return on Equity (ROE %), Return on Assets (ROA %), Non-Performing Loans (NPL %), and Size in Million (RS) descriptive statistics. The presented data included minimum and maximum as well as mean and standard deviation values for all variables. The financial variable Adequacy (%) covered a value spectrum from 7.49% to 22.99% according to the results showing 13.47% as the average with 2.13% defining the standard deviation. Adequate data analysis reveals ROE (%) encompasses 0.13% as its shortest value alongside 42.94% as its largest value at an average of 13.55% and standard deviation of 5.68%. ROA (%) varies from 0.00% to 3.12%, with a mean of 1.47% and a standard deviation of 0.57%. NPL (%) had a minimum of 0.01% and a maximum of 8.83%, with an average of 1.78% and a standard deviation of 1.54%. The size of the firms, measured in million RS, ranged from 9,361.97 to 188,146.09, with a mean of 43,994.24 and a standard deviation of 27,910.54. The valid sample size for all variables is 190, indicating that no missing data was present in the analysis.

4.2 Correlation Analysis

Table 2: *Correlations Analysis*

	Adequacy	ROE	ROA	NPL	Ln_SIZE
Adequacy	1				
ROE	0.003	1			
ROA	.331**	.722**	1		
NPL	-0.121	-.427**	-.280**	1	
Ln_SIZE	.192**	0.059	0.087	-0.089	1

** Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis examines the relationships among Adequacy, Ln_SIZE, ROE, ROA, and NPL. As shown in Table 1, Adequacy was positively correlated with Ln_SIZE ($r = .192$, $p = .008$) and ROA ($r = .331$, $p < .001$), indicating that larger firm size and higher return on assets were associated with higher adequacy. However, Adequacy had a weak and non-significant negative correlation with NPL ($r = -.121$, $p = .095$), suggesting no strong

relationship between non-performing loans and adequacy. ROE and ROA were highly correlated ($r = .722$, $p < .001$), implying that firms with higher return on equity tend to have higher return on assets. Additionally, NPL was negatively correlated with both ROE ($r = -.427$, $p < .001$) and ROA ($r = -.280$, $p < .001$), indicating that higher non-performing loans were associated with lower profitability.

4.3 Regression Analysis

Table 3: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.476	0.226	0.209	1.34249

a. Predictors: (Constant), NPL, Ln_SIZE, ROA, ROE

b. Dependent Variable: Adequacy

The Model Summary provides an overview of the regression model's performance in explaining variations in Capital Adequacy Ratio (CAR). The R value (0.476) indicates a moderate positive correlation between the independent variables (Non-Performing Loans (NPLs), bank size (Ln_SIZE), Return on Assets (ROA), and Return on Equity (ROE)) and the dependent variable (CAR). The R Square (0.226) suggests that 22.6% of the variation in CAR was explained by the selected predictors, implying that other factors beyond these variables contributed significantly to CAR fluctuations. The Adjusted R Square (0.209) was slightly lower, reflecting model efficiency after adjusting for the number of predictors, ensuring that only significant contributions are considered. Lastly, the standard error of the estimate (1.34249) represents the average deviation of actual CAR values from the predicted values, indicating the extent of model accuracy in estimating CAR.

Table 4: *ANOVA*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	92.24	4	23.06	12.795	.000
	Residual	315.399	175	1.802		
	Total	407.639	179			

a. Dependent Variable: Adequacy

b. Predictors: (Constant), NPL, Ln_SIZE, ROA, ROE

The ANOVA table evaluates the overall significance of the regression model by testing whether the independent variables (Non-Performing Loans (NPLs), bank size (Ln_SIZE), Return on Assets (ROA), and Return on Equity (ROE)) collectively explained a significant portion of the variation in the dependent variable (Capital Adequacy Ratio (CAR)). The regression model had a sum of squares of 92.240, with 4 degrees of freedom ($df = 4$), resulting in a mean square value of 23.060. The residual sum of squares was 315.399, with 175 degrees of freedom ($df = 175$), producing a mean square error of 1.802. The F-statistic ($F = 12.795$, $p < .001$) indicates that the model was statistically significant, meaning that at least one of the predictor variables contributed significantly to explaining variations in CAR. Since the p-value (.000) was below the standard threshold of 0.05, the null hypothesis (which assumes no relationship between the predictors and CAR) was rejected, confirming that the model has explanatory power in predicting capital adequacy.

Table 5: *Coefficients*

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics		Remarks
	B	Std. Error	Beta			Tole	VIF	
(Constant)	1.89	4.463		0.423	.672			
Ln_SIZE	0.511	0.184	0.186	2.786	.006	0.991	1.009	H_1: Accepted
ROE	-0.167	0.028	-0.615	-5.885	.000	0.404	2.473	H_2: Accepted
ROA	1.178	0.276	0.416	4.264	.000	0.465	2.149	H_3: Accepted
NPL	-0.347	0.077	-0.347	-4.52	.000	0.751	1.331	H_4: Accepted

a. Dependent Variable: Adequacy

The regression analysis explores the influence of bank size (Ln_SIZE), Return on Equity (ROE), Return on Assets (ROA), and Non-Performing Loans (NPLs) on the Capital Adequacy Ratio (CAR). The model shows that the constant was 1.890, though it was not statistically significant ($p = .672$), implying that when all predictors were zero, the estimated CAR would be 1.890. The coefficient for bank size (Ln_SIZE) is 0.511 ($p = .006$), indicating that a 1-unit increase in bank size (measured as the natural logarithm of total assets) was associated with a 0.511 unit increase in CAR, suggesting that larger banks tend to maintain higher capital adequacy. In contrast, the coefficient for Return on Equity (ROE) was -0.167 ($p < .001$), meaning that a 1-unit increase in ROE led to a 0.167 unit decrease in CAR, highlighting that higher profit distributions to shareholders may negatively affected capital buffers. Return on Assets (ROA) had a positive coefficient of 1.178 ($p < .001$), indicating that a 1-unit increase in ROA results in a 1.178 unit increase in CAR, reinforcing the notion that more profitable banks enhanced their capital reserves. Non-Performing Loans (NPLs) also show a negative relationship with CAR, with a coefficient of -0.347 ($p < .001$), suggesting that an increase in NPLs reduced the capital adequacy ratio, as higher credit risk led to larger provisioning requirements.

The Variance Inflation Factor (VIF) values for all predictors were below 10, and the Tolerance values were above 0.1, indicating that there were no multicollinearity issues among the independent variables. Overall, the regression results underscore the importance of profitability and asset quality in determining CAR, with larger banks and higher ROA contributing positively to capital adequacy, while ROE and NPLs exert negative effects. These findings emphasize the complex dynamics at play in the post-pandemic banking environment.

Table 6: *Residuals Statistic*

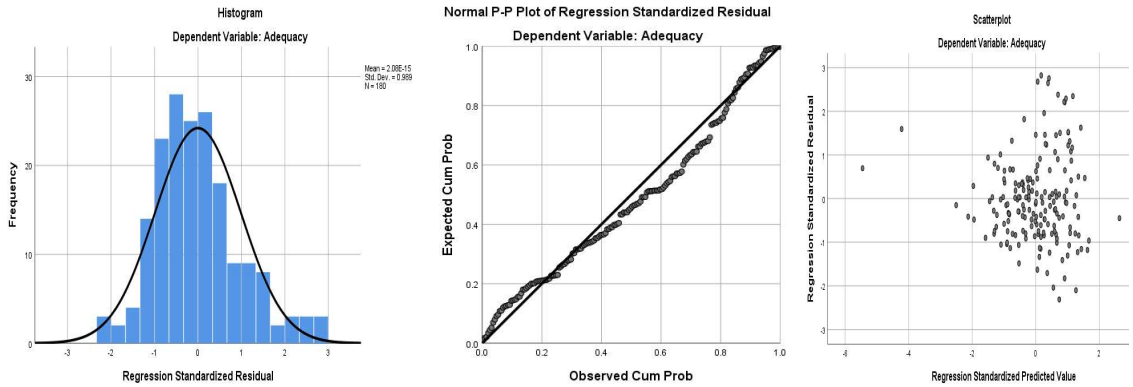
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	9.2671	15.0724	13.1808	0.717	180
Std. Predicted Value	-5.452	2.635	0	0	180
Standard Error of Predicted	0.107	0.712	0.208	0.083	180
Adjusted Predicted Value	8.9028	15.176	13.115	0.752	180
Residual	-3.10194	3.78611	0	1.327	180
Std. Residual	-2.311	2.82	0	0.989	180
Stud. Residual	-2.636	2.851	-0.002	1.008	180
Deleted Residual	-4.03831	3.94803	-0.0464	1.381	180
Stud. Deleted Residual	-2.683	2.912	0	1.016	180

Mahal. Distance	0.14	49.285	3.978	5.76	180
Cook's Distance	0	0.42	0.009	0.035	180
Centered Leverage Value	0.001	0.275	0.022	0.032	180

a. Dependent Variable: Adequacy

The Residuals Statistics table provides important diagnostic measures to identify potential outliers in the regression analysis. The Studentized Deleted Residual values ranged from -2.683 to 2.912, with a mean of 0.000 and a standard deviation of 1.016. According to the thumb rule, values outside the range of -3 to 3 for studentized deleted residuals might indicate outliers, so none of the observations fell outside this range, suggesting no significant outliers based on this criterion (Field, 2013). The Cook's Distance ranges from 0.000 to 0.420, with a mean of 0.009 and a standard deviation of 0.035. A Cook's Distance value greater than 1 is typically considered indicative of influential outliers (Cook & Weisberg, 1982); since the maximum value in this case is well below 1, it indicates that no observation is unduly influencing the regression model. Finally, the Centered Leverage Value ranged from 0.001 to 0.275, with a mean of 0.022 and a standard deviation of 0.032. Leverage values above 2(k+1)/n, where k is the number of predictors and n is the number of observations, can be concerning, but the values here remain well within acceptable limits, suggesting no problematic leverage values (Tabachnick & Fidell, 2019). Overall, the diagnostic statistics suggest that the model did not have significant outliers or leverage points affecting the results.

Figure 2: *Normality Test*



The normality assumption of the regression model was assessed using a histogram of standardized residuals, a normal probability-probability (P-P) plot, and a scatterplot of standardized residuals against predicted values. The residual distribution in the histogram displayed an approximately normal shape which became evident through its symmetrical arrangement around zero while its mean value stood at M = 2.08E-15 and its standard deviation equaled SD = 0.969. The P-P plot revealed normal distribution because points aligned with the diagonal line indicating slight deviation from normality according to Field (2018). The scatterplot of standardized residuals against predicted values showed no signs of pattern which indicates homoscedasticity (Tabachnick & Fidell, 2019). The analysis demonstrates that regression residuals match the normality requirement thus making parametric statistical model selection appropriate.

5. Discussion

This study's regression analysis concurs with previous financial research theories which are supported by past empirical findings. The analysis reveals crucial factors affecting capital adequacy measurement which include bank size together with profitability and credit risk components. The study's results proceed in order to establish connections with established financial theory and confirmed earlier empirical findings as well as the study's data results.

Under the Capital Buffer Theory banks that operate at larger scales need to keep increased capital reserves both for risk management and regulatory compliance to achieve financial stability (Calem & Rob, 1999). The existing literature demonstrates that bank size and capital adequacy have a positive link. Al-Tamimi and Obeidat (2013) established that size matters in CAR levels where larger banks demonstrate higher levels because they face both regulatory oversight and enhanced risk management practices. The research by Mili et al. (2017) showed that bigger banks have superior capitalization levels which confirms that bank size contributes positively to CAR levels. Bank size as measured by Ln_SIZE showed a statistically significant positive connection to CAR according to this study and past academic literature and theoretical background ($\beta = 0.511$, $p = .006$). Bank size presents itself as a leading variable because a one-unit increase in total assets measured through a natural logarithmic scale produces a 0.511 unit rise in CAR levels indicating improved capital adequacy to comply with regulations and manage risks.

Firms should strive for the proper equilibrium between profitability and capital structure according to the Trade-Off Theory because higher shareholder dividends reduce retained earnings thus lowering CAR (Myers, 2001). The capital sufficiency of banks weakens when they choose shareholder returns as their top priority. Research has discovered that ROE has a negative effect on CAR. High shareholder distribution levels in banks reduce retained earnings and consequently lower their capital adequacy according to Berger et al. (2008). Banks maintaining high ROE typically maintain lower capital reserves since they disburse increased dividend payments according to Al-Tamimi and Obeidat (2013). Research results confirm a direct negative correlation between ROE and CAR ($\beta = -0.167$, $p < .001$) which demonstrates how rising ROE by one unit decreases CAR by 0.167 units. The results demonstrate that when profit distributions increase the bank reduces its retained income reducing its capital adequacy ratio.

Profitable banks tend to build up capital reserves through their retained earnings because this internal funding option helps them to capitalize (Mishkin, 2016). Strong profitability amongst banks reduces their need for external funds and enables them to maintain higher levels of CAR. Numerous investigations have proven that better return on assets results in better capital adequacy performance. According to Mili et al. (2017), profitable banks advance their capital reserves. Boudriga et al. (2009) found that profitable banks handle earnings specifically towards capital reserve accumulation which decreases their financial risks. This study found a positive significant link between return on assets and capital adequacy ratio ($\beta = 1.178$, $p < .001$) that demonstrates a 1.178 unit rise in CAR from a 1-unit increase in ROA. Higher profitability levels enable institutions to strengthen their financial capital which helps stabilize their system.

According to the Credit Risk Theory banks need to set larger capital reserves to handle potential losses due to non-performing loans while this process results in declining capital

adequacy over time (Bikker & Metzemakers, 2005). Higher ratios of NPL correspond to elevated risk exposure levels which cause weakened capital protection measures. Prior research establishes how NPLs demonstrate a negative influence on CAR levels. According to Boudriga et al. (2009) research banks need to boost their provisions when NPL ratios rise leading to a decrease in capital adequacy. When banks carry high credit risks their existing capital positions show signs of weakening according to Al-Tamimi and Obeidat (2013). The results validated prior research demonstrating a negative link between NPLs and CAR with a statistically significant coefficient value of $\beta = -0.347$, $p < .001$. The escalation of NPLs leads to reductions in capital adequacy levels since banks need to set aside more provisions which depletes their existing capital reserves.

This research study shows parallel findings that match theoretical financial research as well as existing empirical outcomes. The examination shows that bank size together with ROA profitability creates positive effects on CAR but ROE payments along with NPLs represent negative effects on CAR. The study contributes new knowledge about banking regulation and financial stability through findings that stress how banking profitability management and risk reduction and capital adequacy principles improve stability in the financial industry.

6. Conclusion

This research study yields valuable knowledge to understand what affects banking sector capital adequacy levels. Bank size together with profitability (ROA) creates positive effects on capital adequacy ratio (CAR) and yet shareholder distributions (ROE) coupled with credit risk (NPLs) generate negative effects on CAR. Bank size maintains a positive correlation with CAR which falls in line with the Capital Buffer Theory because large banks establish abundant capital reserves both to adhere to regulatory standards and to reduce risks. ROA positively affects CAR by supporting the Profitability Hypothesis because profitable banks build stronger capital resources that improve financial stability. The negative link between Return on Equity and Capital Adequacy Ratio shows that banks which focus on shareholder value through ROE tend to decrease their capital buffer due to reduced retained earnings as per the Trade-Off Theory. Rising non-performing loans create diminishing capital reserves according to the Credit Risk Theory since they generate a negative link with capital adequacy ratios.

The studied information indicates useful applications that help government leaders as well as financial organization regulators and their governing bodies. A regulatory body needs to compel banks to improve their capital adequacy ratios through better earnings management and risk reduction that aims at decreasing nonperforming loan levels. Banks need to develop permanent capital management systems which maintain financial stability through balanced improvements in profits and appropriate reserved funding systems. Strict capital adequacy regulatory norms need introduction from the government since these safeguards protect banks from financial breakdown during economic downturns. Banks need to improve their loan assessment procedures and loan recovery strategies because this creates better risk management that fights nonperforming loan problems. Research in academe needs to analyze various capital adequacy formative elements with macroeconomic indicators and regulatory framework modifications for better understanding of banking sector stabilization.

Research exploring how macroeconomic variables and financial technology together with regulatory changes affect capital adequacy should be conducted in the future. Studies based on prolonged observation methods enable better understanding of how economic disturbances affect CAR throughout its evolution. Studies comparing different banking systems could disclose the alternative approaches banks use to handle capital resources. The study of corporate governance structures in banking institutions would improve comprehension of risk control procedures.

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