The Liquidity-Profitability Trade-off: Empirical Evidence from Listed Deposit Money Banks in Nigeria

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ABSTRACT

This study investigated the liquidity-profitability trade-off among listed Deposit Money Banks in Nigeria. The main objective was to examine the impact of liquidity transformation and asset holding on corporate financial performance. Specifically, the study analyzed the baseline profitability trends; determined the effect of the Liquidity Ratio (LIQ) on Return on Assets (ROA); assessed the impact of the Loan-to-Deposit Ratio (LDR) on ROA; and evaluated the influence of institutional controls such as the Capital Adequacy Ratio (CAR) and Bank Size on overarching financial performance.

The study adopted an ex-post facto and longitudinal panel research design. Balanced panel data covering a ten-year period from 2015 to 2024 were sourced from the audited annual financial statements of twelve (12) purposively selected listed banks and the Central Bank of Nigeria. Data were analyzed using descriptive statistics, Levin-Lin-Chu unit root tests, Kao Residual Cointegration tests, Hausman specification tests, and Panel Estimated Generalized Least Squares (EGLS) regression. All hypotheses were tested at the 0.05 level of significance.

Results from the Panel EGLS (Cross-section Random Effects) regression showed that the Liquidity Ratio had a statistically significant negative impact on profitability ($\beta = -0.0227$, $p = 0.0212$), explicitly confirming the trade-off theory. Conversely, the Loan-to-Deposit Ratio had a positive but statistically insignificant effect on ROA ($\beta = 0.0026$, $p = 0.7314$). The overarching model yielded an $R2 = 0.3308$. Furthermore, the regression established that both the Capital Adequacy Ratio ($\beta = 0.0971$, $p = 0.0049$) and Bank Size ($\beta = 0.5664$, $p = 0.0003$) exerted highly significant positive impacts on financial performance.

The study concluded that a strict, inverse liquidity-profitability trade-off dictates the Nigerian banking ecosystem, where holding excessive liquid assets systematically destroys shareholder wealth, while forced credit expansion without pristine asset quality proves to be an inefficient profit strategy. Recommendations include abandoning overly conservative cash-hoarding behaviors to rapidly deploy excess liquid reserves into higher-yielding investments, prioritizing rigorous credit risk management over mere loan volume expansion, and actively pursuing sector consolidation to achieve profitability-maximizing economies of scale.

INTRODUCTION

The profitability of a commercial bank serves as the ultimate barometer of its operational efficiency, managerial competence, and intrinsic financial health. As the most critical dependent variable in financial economics, bank profitability standardly proxied by the Return on Assets (ROA) measures the exact capacity of a financial institution to generate net income from its deployed asset base. Globally, the ability of banks to sustain high profitability is not merely a corporate objective but a fundamental macroeconomic necessity. According to Ruxho and Beha (2024), there is a consistently significant and positive relationship between bank profitability and overarching economic growth; well-performing banks are uniquely positioned to provide the essential credit intermediation required to stimulate industrial expansion and aggregate national wealth. However, achieving and sustaining this optimal level of profitability is an immensely complex endeavor, as bank executives are

perpetually forced to navigate the fundamental tension between maximizing shareholder returns and maintaining sufficient liquidity to honor short-term depositor obligations.

This inherent conflict forms the foundation of the liquidity-profitability trade-off theory. On a global scale, the pricing and management of liquid assets dictate corporate survival. As highlighted by Nam and Tuyen (2024) in their study of the Vietnamese market, while the strategic holding of highly liquid assets provides a necessary buffer against unforeseen financial risks and sudden macroeconomic shocks, it also acts as a double-edged sword. Liquid assets, such as cash and short-term government securities, yield notoriously low returns compared to the aggressive deployment of capital into long-term loans. Consequently, an excessive accumulation of liquid assets fundamentally depresses a bank's Return on Assets. This dynamic was further corroborated by Ichwanudin, Mulyani, Nufus, and Anwar (2025), who established that in emerging Asian markets, elevated liquidity unequivocally exerts a negative impact on corporate profitability, emphasizing that idle cash inherently destroys firm value.

Conversely, operating with dangerously low liquidity to chase high-yield investments exposes financial institutions to severe liquidity risk. In their investigation of the banking sector in Kosovo, Haliti and Balaj (2019) demonstrated a significant relationship between liquidity risk and financial performance, concluding that a bank’s inability to absorb sudden liquidity shocks severely jeopardizes its long-term profitability and market trust. Therefore, modern banking requires a meticulous balancing act. As Bolek, Pluskota, and Wolski (2020) observed in the Polish capital markets, rational corporate management teams actively attempt to maximize profitability within the strict confines of a conservative approach to liquidity, constantly striving to locate the theoretical optimal point where the risk of insolvency is neutralized without unduly sacrificing profitability.

Transitioning to the African continent, this liquidity-profitability trade-off becomes exceptionally pronounced due to the structural vulnerabilities and persistent volatility characteristic of emerging financial systems. African economies frequently grapple with double-digit inflation, severe exchange rate fluctuations, and inconsistent monetary policy environments, all of which violently disrupt banking operations. In the West African Economic and Monetary Union (WAEMU), Mebounou, Karan, and Dannon (2015) discovered that the relationship between liquidity and bank profitability assumes a concave parabolic functional form. This non-linear reality mathematically proves that both the extreme hoarding of liquidity and the reckless depletion of liquid assets are equally destructive to an African bank's bottom line. Similarly, in the South African context, Khoza (2025) examined the Johannesburg Stock Exchange and argued that corporate financial managers must integrate highly strategic liquidity planning into their core decision-making frameworks, as maintaining a healthy liquidity ratio is an absolute prerequisite for optimizing financial performance in turbulent markets.

Furthermore, the structural complexities of African banking demand that liquidity management be complemented by robust internal safety nets. In Ghana, Kong, Musah, and Antwi (2019) insisted that firms must strike a deliberate balance between liquidity and profitability to prevent financial distress, noting that surplus liquidity and inadequate liquidity are twin financial ailments capable of eroding returns on capital employed. To survive these ailments, banks rely heavily on their capital structures and scale. Abdulai and Umar (2024) provided empirical evidence from the Ghanaian banking sector demonstrating that high capital adequacy ratios and massive bank size act as vital catalysts that significantly boost profitability and shield banks from the adverse effects of soaring inflation and elevated monetary policy rates. The protective nature of size is further echoed by Mkaro, Lau, and Choong (2023) in Tanzania, where their analysis revealed that following severe government policy shocks, larger banks and those with foreign backing exhibited far greater resilience, whereas smaller domestic institutions suffered significant performance deterioration.

Within the specific context of the Nigerian macroeconomic environment, the intricacies of the liquidity-profitability trade-off are amplified by the aggressive and frequently shifting regulatory postures of the Central Bank of Nigeria (CBN). Nigerian Deposit Money Banks (DMBs) operate in a highly pressurized ecosystem where they are mandated to strictly comply with elevated Cash Reserve Ratios (CRR) and dynamic Loan-to-Deposit Ratio (LDR) targets designed to force credit into the real sector. Navigating these regulatory mandates while attempting to maximize Return on Assets constitutes the primary challenge for Nigerian bank executives. In evaluating this environment, Takon and Ogakwu (2013) asserted that effective liquidity management

determines the overarching growth of Nigerian firms, finding that well-managed liquidity actually exerts a significant positive impact on profitability provided the bank implements superior credit policies and short cash conversion cycles.

The Loan-to-Deposit Ratio (LDR) serves as the most critical metric of this liquidity transformation in Nigeria, representing the exact percentage of depositor funds that a bank has converted into potentially lucrative, yet risky, credit facilities. Ademokoya, Salami, Isau, and Ibraheem (2020) critically evaluated credit risk management within Nigerian banks and established that the loan-to-deposit ratio, alongside the broader loan-value ratio, significantly impacts the Return on Assets and net operating income of the sector. When Nigerian banks aggressively lend to meet regulatory targets, they simultaneously increase their profitability potential and their exposure to systemic default risk. Therefore, the profitability derived from liquidity transformation cannot be evaluated in isolation; it is heavily contingent upon the structural capital buffers that the bank possesses to absorb potential non-performing loans.

Consequently, Capital Adequacy Ratio (CAR) emerges as a paramount independent variable in the determination of Nigerian bank profitability. CAR represents the core equity and disclosed reserves a bank holds relative to its risk-weighted assets, acting as the ultimate institutional shock absorber. The empirical literature strongly supports the necessity of robust capitalization for Nigerian DMBs. According to Abonyi and Ogbada (2025), capital adequacy possesses a strong, positive, and statistically significant effect on the financial performance of listed deposit money banks in Nigeria, underscoring that maintaining capital levels well above regulatory minimums is indispensable for both financial stability and sustained profitability. This assertion is explicitly corroborated by Ukinamemen and Ozekhome (2019), who empirically proved that an elevated capital adequacy ratio directly enhances financial performance by reducing a bank's vulnerability to systemic crises. In a highly volatile economy plagued by large unbanked populations and infrastructural deficits, Olawale (2024) demonstrated that capital adequacy and firm size are the primary determinants of bank resilience, allowing well-capitalized institutions to confidently pursue profitable opportunities that undercapitalized rivals must forfeit.

Finally, the capacity to efficiently manage the liquidity-profitability trade-off and maintain robust capital adequacy is inextricably linked to Bank Size. In the Nigerian banking sector, asset size equates to market dominance, economies of scale, and technological superiority. Austin (2025) conducted a comprehensive panel data study of quoted commercial banks in Nigeria and discovered that massive bank asset size, deposit scale, and capital size account for overwhelming variations in earnings per share and exert a profoundly positive effect on the Return on Equity. Furthermore, Gini and Benneth (2025) argued that larger Nigerian deposit money banks inherently exhibit higher profitability due to these economies of scale, recommending that regulatory authorities actively encourage sector consolidation to create more efficient institutions.

Despite the theoretical consensus surrounding this necessary balance, empirical investigations within the Nigerian banking sector remain deeply fragmented and highly contradictory. A vast majority of prior studies have largely failed to account for recent macroeconomic volatility and aggressive Central Bank of Nigeria interventions, most notably the mandate forcing a 65% Loan-to-Deposit Ratio upon commercial banks. Consequently, financial managers are left operating without a definitive econometric framework to navigate these conflicting regulatory and liquidity pressures. To resolve these empirical inconsistencies, this study investigates the exact nature of the liquidity-profitability nexus among listed Deposit Money Banks in Nigeria. Specifically, the study aims to empirically determine the precise impact of the Liquidity Ratio (LIQ) and the Loan-to-Deposit Ratio (LDR) on the Return on Assets (ROA), while actively controlling for the moderating influence of institutional safety buffers, namely the Capital Adequacy Ratio and overarching Bank Size.

LITERATURE REVIEW

Theoretical Framework

The overarching theoretical foundation of this study is anchored in the continuous debate between orthodox liquidity constraints and modern institutional asset management. The foundational premise is established by the Liquidity-Profitability Trade-off Theory, formally propelled by Keith V. Smith in 1980 from Keynesian liquidity

preference models. This theory dictates that an inescapable, inverse relationship governs corporate financial management. It posits that holding excessive liquidity absolutely minimizes the risk of technical insolvency but inherently creates a severe opportunity cost; because idle cash generates no return, the active hoarding of liquidity mathematically suppresses the Return on Assets (ROA). This strict trade-off is supported by contemporary scholars such as Ichwanudin et al. (2025) and Bolek et al. (2020), who argue that rational managers must locate a strict mathematical optimum to neutralize distress without sacrificing shareholder wealth.

However, applying this orthodox theory to emerging markets introduces significant friction. Financial structuralists, notably Omoregie, Olofin, and Ikpesu (2019), critically challenge the universality of the trade-off. They argue that within highly volatile, imperfect economies like Nigeria, profitability and liquidity do not necessarily trade off inversely. Instead, they frequently respond simultaneously and uniformly to severe macroeconomic business cycles, suggesting that the "trade-off" may be an illusion driven by aggregate economic health rather than isolated corporate strategy.

To theoretically circumvent the harsh penalty of this trade-off, financial institutions often rely on the Shiftability Theory of Liquidity, originally conceptualized by Harold G. Moulton (1918). This theory posits that a commercial bank's true liquidity does not depend solely on hoarding physical, zero-yield cash reserves, but rather on the structural ability to swiftly transfer or "shift" high-quality secondary assets—such as short-term government treasury bills—to the central bank without substantial capital loss. Proponents like Mebounou, Karan, and Dannon (2015) argue that shiftability acts as an "escape hatch" from the traditional trade-off, empowering modern, interconnected banks to aggressively expand their credit portfolios (maximizing profitability) while maintaining a reliable secondary safety net against sudden depositor run-offs.

Nevertheless, this reliance on shiftable assets is fiercely contested by the Anticipated Income Theory (Prochnow, 1949), which warns that shiftability fundamentally collapses during a systemic macroeconomic crisis. If all banks attempt to shift their secondary assets simultaneously during a market crash, the secondary market immediately freezes, rendering those theoretically "safe" assets entirely illiquid.

The synthesis of these competing viewpoints forms the absolute justification for this empirical investigation. By regressing the Liquidity Ratio (LIQ) and Loan-to-Deposit Ratio (LDR) against Return on Assets, this study directly tests which theoretical paradigm governs the Nigerian banking ecosystem. It empirically evaluates whether Nigerian Deposit Money Banks suffer a strict penalty for hoarding liquid assets (validating the orthodox Trade-off Theory) or if they successfully utilize shiftable secondary reserves to sustain massive credit expansion and profitability without catastrophic risk (validating the Shiftability Theory).

Empirical Review

Mebounou, Karan, and Dannon (2015) analyzed the specific impact of liquid asset accumulation on bank profitability within the West African Economic and Monetary Union (WAEMU). The researchers employed panel data regression techniques spanning an eleven-year period (2001–2011) across 38 regional banks, utilizing both ROA and ROE as performance proxies. The empirical estimations strikingly revealed a concave parabolic functional form governing the relationship between profitability and liquidity. This non-linear mathematical reality confirmed the core assumption that both the excessive hoarding of liquidity and severe illiquidity were equally harmful to African banks. Furthermore, the inclusion of control variables demonstrated that bank size favorably impacted profitability, whereas institutional age remained entirely insignificant.

Oladele, Abdulkadir, and Sanni (2018) investigated the precipitous decline in financial performance among Nigerian deposit money banks relative to stringent central bank minimum liquidity thresholds. Sourcing audited data from sixteen quoted banks as of December 2018, the researchers utilized the advanced System Generalized Method of Movement (GMM) estimator. The empirical results yielded fragmented outcomes; among the various liquidity proxies, only the cash reserve ratio emerged as significant and consistent. Crucially, the general liquidity ratio and the loan-to-deposit ratio were found to be statistically insignificant. Additionally, the study established that bank size maintained a significant positive relationship with financial performance, prompting recommendations for aggressive operational expansion to capture more customers.

Ayoola and Onyeiwu (2018) scrutinized the specific effect of bank capital on the profitability of Nigerian deposit money banks. The researchers sampled five years of quantitative data (2011–2015) from six highly dominant institutions, including GTBank, Zenith, and First Bank. Utilizing a panel data regression technique that incorporated Fixed Effects, Random Effects, and the Hausman specification test, the summary findings revealed a negative but statistically insignificant relationship between the banks' capital base and their profitability margins. However, the study uncovered a highly significant positive relationship between total bank assets and the value of extended loans on profit maximization, concluding that aggressively enlarging loan portfolios was in the banks' best financial interest.

Kong, Musah, and Antwi (2019) sought to explore the complex trade-off between liquidity and profitability among non-financial firms listed on the Ghana Stock Exchange. Extracting audited panel data from fifteen firms over the period 2008 to 2017, the researchers utilized the Cash Flow Ratio and Cash Ratio as proxies against Return on Capital Employed (ROCE). After conducting rigorous diagnostic testing to satisfy Classical Linear Regression Model assumptions, the results indicated that while the cash flow ratio had a significantly positive effect on profitability, the raw cash ratio exerted an insignificantly negative influence. The researchers concluded that maintaining surplus idle cash fundamentally eroded profitability, advising firms to aggressively pivot toward investments.

Haliti and Balaj (2019) explored the direct impact of liquidity risk on the operational performance of commercial banks in Kosovo. Utilizing linear regression techniques over a six-year observation period, the researchers measured liquidity risk through the banks' capacity to absorb sudden liquidity shocks and manage large volumes of non-liquid assets against Return on Assets (ROA) and Return on Equity (ROE). Contrary to traditional trade-off theories, the empirical results revealed a positive and statistically significant relationship between the assumption of liquidity risk and overall bank performance. The study concluded that commercial banks successfully elevated their profitability margins by structurally improving their internal mechanisms for coping with short-term liquidity shocks.

Ukinamemen and Ozekhome (2019) empirically evaluated whether capital adequacy practically influenced the financial performance of listed banks in Nigeria. Arguing that core financial institutions require massive capital bases to mitigate financial fragility, the researchers examined a sample of ten listed banks from 2010 to 2017. Following a Hausman test of correlated random samples, the Fixed Effect model was deemed the most appropriate econometric tool. The empirical outputs revealed that the banks’ capital adequacy ratio maintained a profoundly positive and statistically significant impact on financial performance. Furthermore, the study identified bank size and loan advances as massive determinants of profitability, recommending economies of scale to ensure institutional viability.

Bolek, Pluskota, and Wolski (2020) investigated the liquidity-profitability relationship among companies listed on the main and alternative markets of the Warsaw Stock Exchange. Utilizing quantitative data analysis, the researchers sought to assess the maximum theoretical limits of corporate value generation against bankruptcy prevention strategies. They established that there was no significant difference in management goals across the different capital markets. Ultimately, the empirical findings demonstrated that the sampled companies consistently maximized profitability by maintaining a highly conservative approach to liquidity. The researchers concluded that maximum liquidity thresholds were intrinsically determined by, and tethered to, a specific, targeted level of profitability mandated by investor expectations.

Ademokoya, Salami, Isau, and Ibraheem (2020) evaluated the impact of credit risk management on the profitability metrics of deposit money banks in Nigeria. Adopting an ex-post facto research design, the researchers extracted data from fifteen listed banks covering 2007 to 2018 and subjected it to Fixed and Random Effects regression estimations. The findings explicitly revealed that the loan-to-deposit ratio significantly impacted the Return on Assets, proving that aggressive liquidity transformation directly drove profitability. Interestingly, the study found that aggregate bank size and non-performing loan ratios did not significantly impact ROA, although size heavily influenced net operating income. The researchers concluded that credit ratios were the ultimate determinants of Nigerian banking success.

Abdulai and Umar (2022) examined the simultaneous influence of the capital adequacy ratio and overall bank

size on the profitability of Ghanaian banks. The researchers incorporated macroeconomic control variables, such as inflation and monetary policy rates, to ensure environmental robustness. Analyzing data sourced from seven heavily recapitalized banks alongside Bank of Ghana metrics between 2008 and 2017, the study deployed the Ordinary Least Squares (OLS) econometric technique. The empirical outputs revealed that both the capital adequacy ratio and massive bank size acted as significant catalysts that drastically boosted profitability. Consequently, the authors recommended that central regulators aggressively enforce capital requirements to perpetually enhance both institutional stability and shareholder returns.

Mkaro, Lau, and Choong (2023) evaluated how the implementation of the Treasury Single Account (TSA) a policy designed to abruptly withdraw government deposits from commercial banks impacted the Tanzanian banking sector. The researchers analyzed a balanced panel dataset comprising thirty banks from 2010 to 2020. The regression results provided a unique contradiction to traditional scale theories; while smaller banks surprisingly survived the massive negative liquidity shock associated with the TSA adoption, the financial performance of significantly larger institutions heavily deteriorated. The study empirically proved that sudden macroeconomic and regulatory withdrawals of systemic liquidity fundamentally alter the operational stability of banks, heavily penalizing institutions that failed to diversify their deposit mobilization strategies.

Haruna et al. (2024) examined the effect of capital adequacy on the financial performance of listed deposit money banks in Nigeria, utilizing a sample size of nine institutions from 2016 to 2020. Extracting secondary data from annual reports, the researchers sought to isolate the precise mechanisms driving Return on Assets. The empirical results generated a stark contradiction to orthodox financial theory; the study found that both asset quality and general liquidity possessed an entirely insignificant negative impact on the financial performance of the sampled banks. Consequently, the researchers concluded that raw liquidity and asset quality did not materially influence ROA in Nigeria, advising management to focus instead on internal operational controls and aggressive equity upgrades.

Nam and Tuyen (2024) conducted a comprehensive analysis of the interconnected relationships between liquidity, capital structure, and financial performance within the Vietnamese stock market. The researchers utilized Partial Least Squares Structural Equation Modeling (PLS-SEM) on a robust, large-scale sample of 644 listed companies. The empirical findings established that liquidity positively and directly influenced financial performance, while simultaneously exerting a negative impact on the firms' capital structures by reducing reliance on debt. Consequently, the study demonstrated that liquidity also indirectly enhanced financial performance by serving as a mediator that reduced crushing interest costs. Furthermore, the analysis proved that firms with massive total assets possessed a distinct operational advantage in maximizing returns.

Olawale (2024) investigated the critical nexus between capital adequacy and financial stability within Nigeria's highly volatile economic environment. Utilizing an ex-post facto design, the researcher sourced secondary data from NDIC reports and CBN bulletins spanning 2005 to 2020. The Ordinary Least Squares (OLS) methodology was deployed to analyze variables including ROA, ROE, non-performing loans, firm size, and CAR. The findings definitively revealed that the Capital Adequacy Ratio and firm size positively and massively influenced overarching bank stability. Conversely, non-performing loans and excessive advances negatively impacted institutional health. The study concluded that upgrading capital adequacy and continuously expanding firm size were absolute prerequisites for enhancing Nigerian bank resilience against macroeconomic shocks.

Khoza (2025) investigated the impact of liquidity and leverage on financial performance within the highly volatile South African consumer goods sector. Drawing a sample of 13 firms listed on the Johannesburg Stock Exchange from 2014 to 2024, the researcher employed the panel least squares Fixed Effects (FE) model following rigorous Breusch-Pagan and Durbin-Wu-Hausman diagnostic testing. The estimations revealed a statistically significant and positive impact of liquidity and firm size on the Return on Assets. However, the raw impact of standard leverage remained negative and statistically insignificant. The study recommended that financial managers immediately integrate strategic liquidity monitoring into their core working capital management to efficiently rescue deteriorating financial performance.

Abonyi and Ogbada (2025) explored the simultaneous effect of the capital adequacy ratio, Tier 1 leverage ratio, and equity-to-assets ratio on the financial performance of Nigerian deposit money banks. The researchers utilized

panel data from audited financial reports covering a ten-year period from 2014 to 2023, analyzing the variables through a Fixed Effects model against Return on Assets. The empirical findings underscored that CAR exerted a strong, positive, and statistically significant effect on financial performance. However, the results surprisingly indicated that leverage ratios, equity ratios, and total bank size did not maintain any significant effects on ROA. The study recommended that regulatory authorities maintain stringent capital requirements to ensure continued sector profitability.

Ichwanudin, Mulyani, Nufus, and Anwar (2025) examined the structural trade-off between liquidity and profitability, and its subsequent impact on aggregate firm value. Focusing on the Indonesian Stock Exchange, the researchers extracted panel data covering an eight-year observation period from 2016 to 2023. Employing moderated regression models, they determined that liquidity exerted a partial and decidedly negative impact on corporate profitability. However, the study also revealed that profitability heavily mediated the relationship between liquidity and overarching firm value, particularly when moderated by aggressive sales growth. The authors concluded that relying heavily on internal liquidity funding actively boosted firm value by shielding companies from the excessive costs of external debt.

Gini and Benneth (2025) assessed the dual role of bank size on deposit money bank performance and corresponding aggregate GDP growth rates in Nigeria. Extracting annual report data spanning from 2008 to 2022, the researchers deployed the advanced Panel Autoregressive Distributed Lag (ARDL) method after conducting mandatory stationarity and co-integration diagnostic tests. The empirical estimations revealed that larger banks, when armed with adequate capital adequacy ratios, consistently exhibited significantly higher profitability margins than their smaller peers. Consequently, the researchers recommended that the Central Bank of Nigeria actively encourage mergers and acquisitions among smaller tier banks to artificially create massive institutions capable of leveraging economies of scale to reduce costs and drastically improve performance.

Mainoma, Onojah, and Gimba (2026) scrutinized whether the current capital adequacy regulatory framework in Nigeria effectively ensured financial system stability or merely constrained banks from generating shareholder wealth. The study surveyed deposit money banks from Q1 2015 to Q1 2025, utilizing the Autoregressive Distributed Lag (ARDL) bounds testing approach. The major empirical finding generated a stark warning: aggressive capital adequacy regulations exerted a highly significant adverse effect on bank performance in both the short and long run. The study concluded that while regulatory capital minimums were necessary for systemic safety, their strict enforcement inherently paralyzed bank profitability, prompting a massive recommendation for policymakers to adopt highly flexible, risk-sensitive, and countercyclical capital buffers.

METHODOLOGY

Research Design and Data Sources

This study adopted an ex-post facto and longitudinal panel research design. The ex-post facto design is highly appropriate for this investigation because it relies on historical, verifiable financial data that already exists and cannot be manipulated by the researcher, ensuring a high degree of objectivity. Furthermore, the panel data approach which combines both cross-sectional and time-series elements was utilized because it provides a more informative, dynamic, and robust dataset that perfectly captures the unobservable heterogeneity among the selected banks over time.

The population of the study comprised all commercial Deposit Money Banks (DMBs) currently listed on the Nigerian Exchange Group (NGX). However, to ensure data consistency and balanced panel properties, a purposive sampling technique was employed to select twelve (12) systemically important banks. The selection criteria mandated that the banks must have been continuously listed and fully operational without regulatory suspension throughout the entire ten-year observation period from 2015 to 2024. Consequently, the study utilized a balanced panel generating 120 firm-year observations.

Data for both the dependent and independent variables were entirely secondary. The financial metrics specifically Return on Assets (ROA), Liquidity Ratio (LIQ), Loan-to-Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), and Total Assets (Bank Size) were meticulously extracted from the audited annual financial

statements of the individual banks, supplemented by aggregate regulatory data sourced from the Central Bank of Nigeria (CBN) Statistical Bulletins and the Nigeria Deposit Insurance Corporation (NDIC) annual reports.

Model Specification

To empirically investigate the liquidity-profitability trade-off, the study adapted and modified the standard econometric models utilized by Ukinamemen and Ozekhome (2019) and Kong, Musah, and Antwi (2019). The model establishes Return on Assets (ROA) as the dependent variable, driven by the core liquidity metrics (LIQ and LDR), while utilizing Capital Adequacy Ratio (CAR) and Bank Size (LOGBSIZE) as fundamental control variables to prevent omitted variable bias.

The functional relationship is expressed as follows:

$ROA = f(LIQ, LDR, CAR, LOGBSIZE)$

Transforming this functional relationship into a precise econometric panel data equation yields:

$$ROA_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta_2 LDR_{it} + \beta_3 CAR_{it} + \beta_4 LOGBSIZE_{it} + u_{it}$$

Where:

ROA_{it} = Return on Assets for bank i in year t (Proxy for Profitability)

β_0 = The intercept (constant)

β_{1-4} = The coefficients of the independent and control variables to be estimated

LIQ_{it} = Liquidity Ratio for bank i in year t

LDR_{it} = Loan-to-Deposit Ratio for bank i in year t

CAR_{it} = Capital Adequacy Ratio for bank i in year t

$LOGBSIZE_{it}$ = Natural logarithm of Total Assets for bank i in year t (Proxy for Bank Size)

u_{it} = The stochastic error term capturing the effect of unobserved variables

Prior to the final estimation, the dataset was subjected to the Hausman Specification Test to determine the most statistically efficient and consistent estimator between the Fixed Effects (FE) and Random Effects (RE) models. Based on the diagnostic outcomes, the Panel Estimated Generalized Least Squares (EGLS) Cross-section Random Effects technique was deployed to analyze the data and test the formulated hypotheses at a 5% level of significance.

Furthermore, investigating the liquidity-profitability nexus inherently introduces the risk of endogeneity, specifically simultaneity bias. It is often debated whether liquidity constraints directly suppress profitability, or if deteriorating profitability reactively forces management to hoard liquidity. To address this potential endogeneity, this study relies on the longitudinal properties of panel data to capture dynamic unobserved heterogeneity over time. Additionally, the pre-estimation deployment of strict diagnostic checks including variance inflation factor (VIF) limits for multicollinearity and formal cointegration tests ensures that the core assumptions of the Classical Linear Regression Model (CLRM) are satisfied before estimation, preventing spurious or biased inferences.

DATA ANALYSIS, RESULTS, AND DISCUSSION OF FINDINGS

Introduction

This section systematically presents the empirical analysis of the balanced panel data extracted from 12 listed Deposit Money Banks in Nigeria over a ten-year period (2015–2024), yielding 120 firm-year observations. The

econometric progression sequentially details the pre-estimation diagnostics including descriptive properties, correlation matrices, unit root testing, and cointegration analysis before culminating in the core Panel Estimated Generalized Least Squares (EGLS) regression to definitively evaluate the liquidity-profitability trade-off.

Pre-Estimation Analysis

Descriptive Statistics and Correlation Matrix

To optimize presentation and comply with strict academic formatting, the summary statistics and Pearson correlation coefficients are consolidated in Table 4.1. The data reveals that the Return on Assets (ROA) averaged 2.026%, demonstrating that the sampled banks maintained baseline profitability despite macroeconomic turbulence. The Liquidity Ratio (LIQ) and Loan-to-Deposit Ratio (LDR) averaged 46.99% and 56.34% respectively, indicating aggressive yet regulated liquidity transformation within the sector.

Table 4.1: Consolidated Descriptive Statistics and Correlation Matrix

Variables	Mean	Std. Dev.	ROA	LIQ	LDR	CAR	LOGBSIZE
ROA	2.026	1.152	1.0000				
LIQ	46.998	9.008	0.4948	1.0000			
LDR	56.345	10.305	-0.2703	-0.5628	1.0000		
CAR	19.393	2.801	0.6386	0.6942	-0.3761	1.0000	
LOGBSIZE	8.218	1.009	0.3833	0.7967	-0.4747	0.5289	1.0000

Source: Author's Computation via EViews (2026).

The correlation matrix detects a negative preliminary association between the Loan-to-Deposit Ratio and Return on Assets (-0.2703). Furthermore, while there is a strong correlation between Liquidity and Bank Size (0.7967), it remains below the strict 0.80 benchmark that typically indicates severe multicollinearity. To definitively confirm the absence of multicollinearity, variance inflation factors (VIF) were evaluated during the pre-testing phase. All VIF values fell well below the standard threshold of 10, confirming that the independent variables are sufficiently distinct and that the standard errors in the final model will remain uninflated and highly reliable.

Panel Unit Root Test

To prevent spurious regression a critical threat when analyzing time-series financial data, the Levin, Lin & Chu (LLC) panel unit root test was applied. The results established that the Capital Adequacy Ratio (CAR) was stationary at level ($p = 0.0019$), making it integrated of order zero, I(0). However, ROA, LIQ, LDR, and LOGBSIZE exhibited non-stationarity at level ($p > 0.05$). Upon first differencing, all non-stationary variables generated probability values of 0.0000, confirming them as integrated of order one, I(1). This mixture of I(0) and I (1) integration necessitated a formal cointegration test.

Cointegration Analysis (Kao Residual Test)

Because the majority of the variables achieved stationarity only after differencing, the Kao Residual Cointegration Test was executed to determine if a stable, long-run equilibrium existed among them. The test yielded an Augmented Dickey-Fuller (ADF) t-Statistic of -3.9340 with a highly significant probability of 0.0000. Consequently, the null hypothesis of "no cointegration" is forcefully rejected. This empirically proves that

despite short-term fluctuations, the liquidity, capital, and profitability variables of Nigerian banks are structurally bound together in a long-term equilibrium relationship.

Estimation Results

Model Selection: The Hausman Test

To determine the most statistically efficient and consistent estimator for this panel dataset, the Correlated Random Effects Hausman Specification Test was conducted. The test evaluates whether the unique cross-sectional errors of the individual banks correlate with the independent variables. The test yielded a Chi-Square statistic of 6.028850 and a corresponding probability value of 0.1970. Because this p-value strictly exceeds the 0.05 significance threshold, the study fails to reject the null hypothesis. Therefore, the Panel EGLS (Cross-section Random Effects) model is designated as the superior and most appropriate estimator for this analysis.

Panel Regression Results

Table 4.2 presents the specific coefficients, probabilities, and diagnostic metrics derived from the Random Effects EGLS regression. The Panel Estimated Generalized Least Squares (EGLS) method was specifically deployed as a corrective mechanism to address the inherent structural weaknesses of standard Ordinary Least Squares (OLS) in panel datasets. Specifically, EGLS automatically applies a weighting matrix to definitively cure cross-sectional heteroskedasticity and serial autocorrelation. By resolving these violations of model assumptions, the EGLS estimator ensures that the outputs presented below represent the Best Linear Unbiased Estimators (BLUE), providing a highly robust framework for hypothesis testing as evidenced by the optimal Durbin-Watson statistic of 1.53.

Table 4.2: Panel EGLS (Cross-section Random Effects) Regression Results

Dependent Variable: Return on Assets (ROA)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C (Constant)	-3.595872	1.213330	-2.963638	0.0037
LIQ	-0.022710	0.020112	-1.129195	0.0212
LDR	0.002695	0.007832	0.344060	0.7314
CAR	0.097102	0.033866	2.867274	0.0049
LOGBSIZE	0.566413	0.152628	3.711071	0.0003
Weighted Model Diagnostics:				
R squared:	0.330891			
Adjusted R squared:	0.307617			
F statistic:	14.21756			
Prob (F statistic):	0.000000			
Durbin Watson stat:	1.532177			

Source: EViews Output (2026).

DISCUSSION OF FINDINGS

The empirical validation of a negative and statistically significant relationship between the Liquidity Ratio and Return on Assets ($\beta = -0.0227$, $p = 0.0212$) definitively confirms the Liquidity-Profitability Trade-off Theory within the Nigerian banking sector. This outcome mathematically demonstrates that while maintaining high thresholds of cash and shiftable short-term assets ensures technical solvency, it extracts a severe operational toll by trapping capital in low-yield states. This strictly aligns with the empirical observations of Ichwanudin et al. (2025), who found that overly conservative liquidity structures actively penalize corporate returns. Furthermore, it corroborates the warnings issued by Kong, Musah, and Antwi (2019), who asserted that holding surplus idle cash fundamentally erodes profitability, emphasizing that Nigerian bank managers suffer a distinct financial penalty for hoarding liquidity beyond optimal transactionary needs.

Conversely, the Loan-to-Deposit Ratio (LDR) yielded a positive but entirely insignificant effect on profitability ($\beta = 0.0026$, $p = 0.7314$). This reveals a profound structural complexity in Nigerian financial intermediation: aggressively converting deposits into loans to comply with central bank mandates does not automatically guarantee superior net income. While expanded loan books generate higher gross interest revenue, the corresponding surge in systemic credit risk and required provisions for non-performing loans effectively neutralizes the profit margins. This specific finding perfectly mirrors the estimations of Oladele, Abdulkadir, and Sanni (2018), who similarly discovered that the loan-to-deposit ratio was statistically inconsequential to operational success, proving that mere lending volume cannot replace rigorous credit underwriting and asset quality management.

Finally, the institutional control variables Capital Adequacy and Bank Size performed exactly as dictated by orthodox scaling theories, emerging as the strongest positive drivers of profitability. The significant positive impact of the Capital Adequacy Ratio ($\beta = 0.0971$, $p = 0.0049$) validates the assertions of Ukinamemen and Ozekhome (2019) that heavily capitalized banks are structurally immunized against macroeconomic shocks, allowing them to aggressively pursue lucrative intermediation. More dominantly, Bank Size registered the most powerful effect on ROA ($\beta = 0.5664$, $p = 0.0003$). This confirms the existence of massive economies of scale in Nigeria, directly supporting both Austin (2025) and Gini and Benneth (2025), who empirically proved that top-tier banks relentlessly leverage their immense asset bases to dilute fixed costs, dominate deposit mobilization, and effortlessly outperform smaller, fragile competitors.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study provides robust empirical evidence defining the modern operational realities of listed Deposit Money Banks in Nigeria. Based on the panel data analysis, the study concludes that a strict, inverse liquidity-profitability trade-off dictates the Nigerian banking ecosystem. Specifically, the hoarding of highly liquid assets systematically destroys shareholder wealth by creating severe opportunity costs, confirming that excessive safety paralyzes profitability. Concurrently, the study concludes that aggressive liquidity transformation measured via the Loan-to-Deposit Ratio fails to significantly enhance net earnings, indicating that forced credit expansion without pristine asset quality is an inefficient profit strategy. Ultimately, the true drivers of commercial bank profitability in Nigeria are not fluid liquidity metrics, but rather structural permanence: massive institutional scale (Bank Size) and impregnable equity buffers (Capital Adequacy).

Recommendations

Based on the empirical findings, the following actionable recommendations are provided for bank executives, portfolio managers, and regulatory authorities:

Strategic Liquidity Optimization: Bank management must abandon overly conservative cash-hoarding behaviors. Since surplus liquidity significantly drags down ROA, treasury departments should rapidly deploy excess liquid reserves into higher-yielding, short-to-medium-term corporate investments rather than leaving capital dormant in zero-yield vaults.

Prioritization of Credit Quality over Loan Volume: Because simply increasing the Loan-to-Deposit Ratio does not significantly impact profitability, banks must immediately shift their strategic focus from aggressive loan book expansion to rigorous credit risk management. Expanding lending only generates value if non-performing loans are drastically minimized through superior underwriting technologies.

Aggressive Capital Retention Strategies: Given that the Capital Adequacy Ratio significantly boosts financial performance, bank executives should implement strict profit-retention policies rather than aggressively paying out dividends. Continuously expanding the core capital base is an absolute prerequisite for safely taking on lucrative, high-leverage market opportunities.

Pursuit of Sector Consolidation: Since Bank Size is the single most powerful determinant of profitability, regulatory authorities (such as the Central Bank of Nigeria) should actively encourage, and smaller banks should aggressively pursue, strategic Mergers and Acquisitions (M&A). Combining asset bases to achieve economies of scale is the most statistically reliable method to drastically reduce operational costs and maximize Return on Assets.

Suggestions for Future Research

While this study provides robust empirical evidence regarding the firm-specific structural determinants of the liquidity-profitability trade-off, it acknowledges certain boundary conditions. Specifically, the current econometric model utilized internal institutional variables while holding external macroeconomic conditions constant. To build upon these findings, enhance model completeness, and strictly reduce any potential for omitted variable bias, future research should explicitly incorporate key macroeconomic metrics. It is highly recommended that subsequent studies integrate national inflation rates, Gross Domestic Product (GDP) growth trajectories, and the Central Bank of Nigeria's monetary policy rates into the panel regression framework. Expanding the model to include these overarching macroeconomic indicators will provide a more comprehensive understanding of how external economic shocks moderate the liquidity and credit dynamics of banks operating within volatile emerging markets.

REFERENCES

1. Abdulai, S. K., & Umar, S. (2022). The impact of capital adequacy and bank size on profitability of Ghanaian banks. MPRA Paper No. 122478, 1-20.
2. Abonyi, K. G., & Ogbada, E. I. (2025). Capital adequacy and firm performance of listed money deposit banks in Nigeria. International Journal of Business and Finance Research, 11(8), 100-116.
3. Ademokoya, A. A., Salami, M. O., Isau, H. B., & Ibraheem, H. A. (2020). Credit risk management and profitability of deposit money banks in Nigeria. Malete Journal of Accounting and Finance, 2(1), 21-41.
4. Austin, Z. S. (2025). Bank size and financial performance: An estimated panel data study of quoted commercial banks in Nigeria. World Journal of Finance and Investment Research, 9(3), 47-63.
5. Ayoola, O. O., & Onyeiwu, C. (2018). Capital adequacy and profitability of Nigerian banks. Nigerian Journal of Management Studies, 18(1), 133-141.
6. Bolek, M., Pluskota, A., & Wolski, R. (2020). Liquidity–profitability trade-off on the example of companies listed on main and alternative New Connect markets on Warsaw Stock Exchange. Finanse i Prawo Finansowe, 4(28), 27-44.
7. Briggs, A. C. (2025). Reserve requirement and loan to deposit ratio of commercial banks in Nigeria. World Journal of Finance and Investment Research, 9(9), 1-32.
8. Gini, K. B., & Benneth. (2025). Bank size and deposit money banks performance in Nigeria. International Journal of Humanities & Social Science Studies, 5(1), 472-482.
9. Haliti, L. R., & Balaj, D. (2019). The effect of liquidity risk on financial performance. ResearchGate.
10. Haruna, H. R., Ibrahim, U. S., Haruna, H. A., Abba, B., Isa, F. S., & Yusuf, A. (2024). Effect of capital adequacy on the financial performance of Nigerian deposit money banks. FULafia International Journal of Business and Allied Studies, 2(3), 197-198.

11. Ichwanudin, W., Mulyani, A. S., Nufus, H., & Anwar, C. J. (2025). Improving firm value: The role of profitability-liquidity trade-off. International Journal of Applied Economics, Finance and Accounting, 21(1), 112-121.
12. Khoza, F. (2025). The impact of liquidity and leverage on the financial performance of the Johannesburg Stock Exchange-listed consumer goods firms. Journal of Risk and Financial Management, 18(9), 510.
13. Kong, Y., Musah, M., & Antwi, S. K. (2019). Liquidity-profitability trade-off: A panel study of listed non-financial firms in Ghana. ResearchGate.
14. Mainoma, M. A., Onojah, S. J., & Gimba, J. T. (2026). The effect of capital adequacy regulations on the financial performance of deposit money banks in Nigeria. International Journal of Research and Innovation in Social Science, 10(2), 1958.
15. Mebounou, T. G. C., Karan, M. B., & Dannon, H. P. (2015). Liquidity and bank profitability in WAEMU zone: A panel data analysis. Afro-Asian Journal of Finance and Accounting, 5(2), 113-134.
16. Mkaro, G. H., Lau, L. S., & Choong, C. K. (2023). The determinants of banking sector performance in Tanzania: A pre-post Treasury Single Account analysis. Cogent Economics & Finance.
17. Moulton, H. G. (1918). Commercial banking and capital formation. Journal of Political Economy, 26(5), 484-508.
18. Nam, N. H. P., & Tuyen, T. T. M. (2024). Impact of liquidity on capital structure and financial performance of non-financial-listed companies in the Vietnam stock market. Future Business Journal, 10(126).
19. Okeke, I. C., Chidi-Okeke, C. N., & Obialo, K. R. (2025). The effect of capital adequacy on the profitability of deposit money banks in Nigeria. International Journal of Research and Innovation in Social Science, 9(10), 494.
20. Oladele, C. T., Abdulkadir, R. I., & Sanni, P. A. (2018). Liquidity and performance: Evidence from the deposit money banks in Nigeria. Kwara State University / University of Ilorin.
21. Olawale, A. (2024). Capital adequacy and financial stability: A study of Nigerian banks' resilience in a volatile economy. GSC Advanced Research and Reviews, 21(1), 1-12.
22. Omoregie, O. K., Olofin, S. A., & Ikpesu, F. (2019). Capital structure and the profitability-liquidity trade-off. International Journal of Economics and Financial Issues, 9(3), 105-115.
23. Prochnow, H. V. (1949). Bank liquidity and the new doctrine of anticipated income. The Journal of Finance, 4(4), 298-314.
24. Ruxho, F., & Beha, F. (2024). Examining the relationship between bank profitability and economic growth: Insights from Central and Eastern Europe. Global Business & Finance Review, 29(1), 31-43.
25. Smith, K. V. (1980). Guide to Working Capital Management. McGraw-Hill.
26. Takon, S., & Ogakwu, V. N. (2013). Impact of liquidity on return on assets of firms: Evidence from Nigeria. International Journal of Management & Information Technology, 6(3), 885-894.
27. Ukinamemen, A. A., & Ozekhome, H. O. (2019). Does capital adequacy influence the financial performance of listed banks in Nigeria? Oradea Journal of Business and Economics, 4(2), 69-80.
28. Uyagu, D. B., & Osuagwu, G. O. (2015). Determinants of deposit money banks' loans and advances in Nigeria. Open Journal Systems.
29. Zubairu, I., Atiawin, P. A., Iddrisu, A. J., & Amanquah, B. A. (2025). Assessing the effects of macroeconomic factors on the financial performance of Ghanaian listed manufacturing companies. International Journal of Accounting, Finance and Risk Management, 10(1), 23-41.