Journal of Social Sciences and Management Studies
https://doi.org/10.56556/jssms.v5i1.1454
ISSN: 2957-8795

RESEARCH ARTICLE

Liquidity Risk, Capital Structure, and Financial Performance: A Panel Analysis of Nigerian Deposit Money Banks

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Received: 21 April, 2026, Accepted: 13 June, 2026, Published: 22 June, 2026

Abstract
This study examines the impact of liquidity risk and leverage on the financial performance of listed Deposit Money Banks (DMBs) in Nigeria from 2013 to 2022. Using panel data from all 15 listed DMBs on the Nigerian Exchange Group, the study employs fixed-effects regression with robust standard errors to analyze the relationship between liquidity risk (measured by loan-to-asset ratio), leverage (measured by debt-to-equity ratio), and return on equity. The results show that liquidity risk has a positive and significant effect on ROE (coefficient = 0.132, p = 0.000), suggesting that banks in this high-yield environment profitably transformed liquidity risk through active lending. Conversely, leverage has a significant negative effect on ROE (coefficient = -1.351, p = 0.007), consistent with the Trade-Off Theory. These asymmetric findings imply that effective liquidity management enhances profitability, while excessive leverage erodes it. The study contributes empirical evidence on risk-performance dynamics in emerging market banking and offers implications for risk management policy.

Keywords: Liquidity Risk; Leverage; Financial Performance; Deposit Money Banks; Capital Structure; Trade-Off Theory

1. Introduction

Deposit Money Banks (DMBs) constitute the cornerstone of financial intermediation in developing economies, serving as critical conduits for mobilizing funds from surplus units to deficit units. In Nigeria, the banking sector's health directly impacts the soundness and stability of the broader economy, contributing to financial services expansion, employment generation, and macroeconomic stability (Arzova & Sahin, 2023). However, DMBs face persistent challenges including non-performing loans, maturity mismatches, and market volatility, which expose stakeholders to operational and financial risks (Yunusa, Ekundayo, & Orshi, 2019). The management of these risks particularly liquidity risk and leverage remains central to bank survival and profitability.

The Nigerian banking sector has undergone substantial structural and regulatory evolution during the past decade. Following the 2004/2005 consolidation exercise that reduced the number of banks from 89 to 25, the sector faced renewed challenges from the 2008 global financial crisis and subsequent regulatory reforms (Efobi, 2022). The Central Bank of Nigeria (CBN) progressively tightened liquidity requirements during the study

period, increasing the Cash Reserve Ratio (CRR) from 12% in 2013 to 32.5% by September 2022, while maintaining the statutory Liquidity Ratio at 30% (Central Bank of Nigeria, 2023). Additionally, the introduction of Basel III standards, including the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR), has fundamentally altered how banks manage liquidity transformation (Basel Committee on Banking Supervision, 2019; Ogolugbo, 2021). These regulatory adjustments directly impact the fundamental tension between liquidity and profitability a tension that lies at the heart of banking operations globally and particularly in emerging markets facing volatile capital flows. The significance of this study is amplified by Nigeria's position as Africa's largest economy and the critical role of its banking sector in financial intermediation. As of 2022, five Domestic Systemically Important Banks (D-SIBs) Access Bank, First Bank, Guaranty Trust Bank, United Bank for Africa, and Zenith Bank controlled 59% of banking assets, 61% of deposits, and 56% of industry loans, with the oil and gas sector commanding 26% of total credit (U.S. Department of State, 2024). Understanding how liquidity risk and leverage affect performance in this concentrated, resource-dependent banking environment offers lessons for other emerging markets facing similar structural challenges, particularly in resource-dependent economies with concentrated banking systems.

Liquidity risk refers to the possibility that a financial institution may struggle to meet short-term financial obligations due to a disparity between liquid assets and liabilities. Effective management of liquidity risk is vital for ensuring financial stability and operational continuity (Anande-Kur, Faajir, & Agbo, 2020). However, excessive liquidity buffers may constrain lending activities and reduce profitability a trade-off that Nigerian banks navigated during the CBN's aggressive monetary tightening in 2022. On the other hand, leverage involves using borrowed capital to amplify potential returns, but also increases the risk of losses exceeding initial investment (Somoye, Ilo, & Yunusa, 2019). The optimal level of leverage remains theoretically contested, with the Trade-Off Theory suggesting an optimal capital structure that balances tax benefits against financial distress costs (Kraus & Litzenberger, 1973; Myers & Majluf, 1984), while the Pecking Order Theory emphasizes financing hierarchies driven by asymmetric information.

The objective of this study is to analyze the impact of liquidity risk and leverage on the financial performance of listed DMBs in Nigeria, measured by return on equity (ROE). This investigation is significant for several stakeholders. For policymakers, the findings provide insights to inform regulatory frameworks that enhance banking sector stability without unduly constraining profitability. For banking executives, understanding the differential impact of liquidity risk versus leverage on financial performance can guide strategic capital and liquidity management decisions. For investors, the results offer evidence-based guidance on risk factors affecting bank valuations.

To address these objectives, the study poses the following research questions:

i. To what extent does liquidity risk affect the financial performance of listed Deposit Money Banks (DMBs) in Nigeria?
ii. What is the impact of leverage on the financial performance of listed Deposit Money Banks (DMBs) in Nigeria?

In order to systematically investigate these questions, the study tests the following hypotheses:

$H0^1$: Liquidity risk has no significant impact on the financial performance of listed Deposit Money Banks (DMBs) in Nigeria.

$H0^2$: Leverage has no significant impact on the financial performance of listed Deposit Money Banks (DMBs) in Nigeria.

The scope of this study encompasses the period from 2013 to 2022, focusing on 15 listed DMBs in Nigeria. This period captures the post-consolidation era, the 2016 economic recession, the COVID-19 pandemic (2020-2021), and the initial recovery phase (2022). The primary variables under investigation are liquidity risk (measured by Total Loan-to-Total Asset Ratio) and leverage (measured by Total Debt-to-Equity Ratio), with financial performance measured by return on equity (ROE). Control variables include firm size (total assets) and earnings per share (EPS).

The remainder of this paper is structured as follows: Section 2 reviews relevant theoretical and empirical literature; Section 3 presents the research methodology; Section 4 discusses the empirical results; and Section 5 concludes with policy implications and recommendations.

2. Literature Review

2.1 Theoretical Foundation

The theoretical foundation of this study integrates three complementary perspectives on bank performance that collectively explain the liquidity-leverage-performance nexus in emerging market banking contexts.

2.1.1 Trade-Off Theory of Capital Structure

The Trade-Off Theory, originating from Kraus and Litzenberger (1973) and refined by subsequent scholars, posits that firms seek an optimal capital structure that balances the tax advantages of debt financing against the costs of financial distress. In banking contexts, this translates to balancing deposit-funded lending (leverage) against equity capital requirements. The theory predicts a U-shaped relationship between leverage and firm value: initially, increasing leverage enhances value through tax shields and disciplined management, but beyond an optimal threshold, the marginal cost of financial distress (bankruptcy costs, agency costs, loss of financial flexibility) exceeds marginal benefits, reducing profitability and firm value (Frank & Goyal, 2009). This theoretical prediction aligns with the study's empirical finding of a negative leverage-ROE relationship, suggesting that Nigerian banks during 2013-2022 operated beyond the optimal leverage threshold.

2.1.2 Pecking Order Theory

Myers and Majluf's (1984) Pecking Order Theory suggests that firms prefer internal financing, then debt, and equity only as a last resort, due to asymmetric information costs and signaling effects. In banking, this hierarchy influences how liquidity risk materializes when internal funds prove insufficient to meet withdrawal demands. Banks with strong internal capital generation (retained earnings) can better manage liquidity shocks without resorting to costly external borrowing or fire-sale asset liquidations. This theory helps explain why firm size (proxy for internal resource availability) consistently shows positive association with ROE in banking studies.

2.1.3 Financial Intermediation Theory

Modern Financial Intermediation Theory, as articulated by Diamond and Dybvig (1983) and extended by Berger and Bouwman (2013), emphasizes banks' core economic function: liquidity transformation converting short-term, liquid deposits into long-term, illiquid loans. This transformation inherently generates liquidity risk but also creates value through maturity intermediation. The theory suggests that effective liquidity risk management

is not about eliminating risk but optimizing it maintaining sufficient liquid assets to meet expected and unexpected withdrawals while deploying excess liquidity into productive lending. This theoretical perspective supports the study's empirical finding of a positive liquidity risk-ROE relationship, indicating that Nigerian banks successfully transformed liquidity risk into profitability during the study period.

2.1.4 The Acharya-Naqi Liquidity-Leverage Framework

Acharya and Naqvi (2012) provide a two-dimensional framework integrating financial and operational factors of bank performance through liquidity risk and leverage dynamics. They emphasize that both dimensions affect financial stability and profitability: conservative liquidity management leads to cautious approaches, while aggressive leverage strategies pursue higher returns. Berger and Bouwman (2013) expanded this framework by conceptualizing "effective liquidity management" as a strong predictor of financial stability, while "optimal leverage" results in enhanced profitability. The framework distinguishes between conservative and aggressive climates that lead to different financial performance outcomes, providing the primary theoretical anchor for this study.

2.1.5 Regulatory Context and Banking Performance in Nigeria

The Nigerian banking sector operates within a dynamic regulatory framework that significantly influences liquidity and leverage decisions. The CBN's monetary policy implementation relies on the Monetary Policy Rate (MPR), Cash Reserve Ratio (CRR), and Liquidity Ratio as primary instruments (International Monetary Fund, 2018; Central Bank of Nigeria, 2023). During the study period, the CBN aggressively utilized these tools in response to macroeconomic conditions. In 2013-2014, the CRR stood at 12-20% with the MPR at 12%, reflecting post-consolidation stability. By 2015-2016, the CRR increased to 22.5% during the economic recession as the CBN sought to manage inflationary pressures and currency instability. In 2019, the CRR was raised further to 27.5% to manage inflation and currency stability, while a minimum Loan-to-Deposit Ratio of 60% was introduced to stimulate private sector credit. The COVID-19 pandemic in 2020-2021 prompted regulatory forbearance measures, including loan restructuring provisions and temporarily reduced constraints, to support economic activity during the crisis. By 2022, the CBN implemented aggressive monetary tightening, increasing the CRR to 32.5% and raising the MPR to 15.5% to combat rising inflation (Central Bank of Nigeria, 2023).

These changes directly affected banks' cost of funds and liquidity positions. The introduction of Basel III standards in Nigeria added another layer of complexity. While full implementation remains ongoing, the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) requirements have influenced bank behavior since 2015 (Ogolugbo, 2021). The LCR requires banks to hold sufficient high-quality liquid assets to withstand 30-day stress scenarios, potentially constraining lending activities that generate higher returns (Basel Committee on Banking Supervision, 2019).

The COVID-19 pandemic (2020-2021) introduced unprecedented challenges. The CBN implemented regulatory forbearance measures including loan restructuring, reduced CRR, and moratoriums to support economic activity (Central Bank of Nigeria, 2021). Nigerian banks' ROE declined from 15.3% (2019) to 6.5% (2020), recovering to 8.5% by 2022 (Central Bank of Nigeria, 2023). This volatility underscores the importance of understanding risk-performance relationships across normal and crisis periods.

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2.2 Empirical Literature Review

2.2.1 Liquidity Risk and Financial Performance

The empirical literature on liquidity risk and bank performance presents nuanced findings across contexts. Recent Nigerian studies provide more specific evidence. Ugwu and Okwo (2026) analyzed 2014-2023 data from 14 Nigerian banks and found that Loan-to-Deposit Ratio (LDR) a key liquidity risk indicator had a significant positive effect on ROE (coefficient = 0.040697, p = 0.0003), while Cash Reserve Ratio and Liquidity Coverage Ratio showed negative but insignificant effects. This suggests that active lending (higher LDR) enhances profitability despite increased liquidity risk a finding consistent with the present study's positive liquidity risk coefficient. The authors concluded that "the more active the banks are in lending, the higher their returns" (Ugwu & Okwo, 2021).

Andabai and Oyakegha (2024), examining 1993-2023 data from 12 Nigerian banks, found that loans and advances positively impacted ROA, but emphasized that non-performing loans management remains critical for performance. Their findings support the view that liquidity risk, when managed through quality lending, enhances rather than diminishes profitability. This aligns with the "effective liquidity management" concept in the Acharya-Naqi framework. Ahmed et al. (2021) examined interactions between liquidity management, bank size, and financial performance among Nigerian banks using primary data from structured questionnaires. Their findings revealed that efficient liquidity management significantly enhances financial performance, with bank size moderating the relationship. This supports the Financial Intermediation Theory's prediction that scale economies facilitate better liquidity transformation. However, contradictory evidence exists. Olagunju et al. (2020) assessed liquidity risk impact on profitability of listed Nigerian banks using secondary data and regression analysis. Their results indicated that high liquidity ratios are associated with reduced profitability, highlighting the trade-off between liquidity and profitability. Owolabi and Alu (2019), utilizing Central Bank of Nigeria data and panel analysis, demonstrated that liquidity risk measured by loan-to-deposit ratio negatively impacts financial stability a finding that appears contradictory but may reflect different performance measures (stability vs. profitability) and time periods.

African comparative studies provide regional context. In Kenya, Alex and Ngaba (2018) found that firm size positively moderates the liquidity-performance relationship, while in Tanzania, Mwajombe (2016) observed that commercial banks operated with debt ratios exceeding 80%, yet profitability (ROA 3.7-5.2%) remained below theoretical benchmarks (15%), suggesting diminishing returns to aggressive liquidity transformation in less developed banking markets.

2.2.2 Leverage and Financial Performance

The empirical literature on leverage and bank performance is extensive but context-dependent. Recent Nigerian evidence strongly supports the negative leverage effect. Francis (2025), studying 25 Nigerian commercial banks from 2004-2023, found that equity-to-total assets ratio (EQTA) and long-term-debt-to-total assets ratio (LTDTA) had significant negative effects on ROA, supporting the Trade-Off Theory's prediction that excessive equity or long-term debt reduces profitability. The author concluded that "the study recommends that banks should use more of short term debt than long term debt to finance their assets" (Francis, 2025). Adebiyi and Fakorede (2019) assessed leverage impact on ROE of ten Nigerian banks over ten years using panel regression. Their results depicted a positive relationship between leverage and ROE, suggesting that leveraged banks can generate higher returns for shareholders. However, this study concluded before the 2020-2022 period of monetary tightening and may not reflect current dynamics. Similarly, Adesina et al. (2018) found that moderate debt financing enhances performance while excessive debt leads to financial distress a non-linear relationship that supports the Trade-Off Theory.

International evidence from emerging markets reinforces these patterns. Azzabi and Lahrichi (2024), examining commercial banks in the Middle East, North Africa, and Pakistan (MENAP) region, found that capital structure decisions significantly impact performance, with optimal leverage levels varying by market development stage. Their findings suggest that in less developed financial markets, the negative leverage effect manifests at lower debt thresholds due to higher information asymmetry and monitoring costs. Eze and Okoye (2020) examined the association between leverage, capital structure, and profitability in Nigerian banks using mixed methods. Their findings indicated that high leverage levels are associated with increased financial performance up to a specific threshold, beyond which performance declines due to elevated financial risk a pattern consistent with the Trade-Off Theory.

2.2.3 Research Gaps and Study Contribution

Based on the literature review, this study addresses three critical gaps:

Previous Nigerian studies often rely on single theoretical frameworks (typically the Acharya-Naqi model) without integrating Trade-Off Theory or Pecking Order Theory insights. This study synthesizes multiple theoretical perspectives to provide a more comprehensive explanation of the liquidity-leverage-performance nexus. Most studies treat the 2013-2022 period as homogeneous, ignoring the structural breaks caused by CBN policy changes, Basel III implementation, and COVID-19 disruptions. This study explicitly contextualizes findings within Nigeria's regulatory evolution.

No prior study connects empirical findings on leverage and liquidity to Nigeria's 2024-2026 recapitalization program. This study bridges that gap, providing evidence-based justification for the CBN's equity-strengthening initiative. The study contributes to emerging market banking literature by providing empirical evidence from Africa's largest economy during a period of regulatory intensification, economic volatility, and post-pandemic recovery. The asymmetric findings positive liquidity risk effect versus negative leverage effect offer nuanced guidance for bank management and regulatory policy in similar emerging market contexts.

3. Methodology

This study adopts a descriptive research design utilizing quantitative methods and panel data analysis. The research design was chosen to enable a comprehensive analysis of the relationship between liquidity risk,

leverage, and financial performance among listed deposit money banks in Nigeria over time. Secondary data were obtained from the annual reports and financial statements of the banks, providing reliable and consistent data over the specified period. The use of secondary data ensures objectivity and replicability, while panel data allows control for unobserved heterogeneity and examination of dynamic relationships.

The study population comprised all deposit money banks listed on the Nigerian Exchange Group as of December 31, 2022. A census sampling technique was employed, ensuring that data from all 15 listed banks during the period from 2013 to 2022 were included. This approach was selected to minimize sampling bias and ensure comprehensive analysis. The 15 banks represent the entire population of listed DMBs, eliminating sampling error and maximizing statistical power.

The study period (2013-2022) encompasses significant structural breaks in Nigerian banking regulation and macroeconomic conditions. The early period of 2013-2014 was characterized by post-consolidation stability with the CRR maintained at 12-20%. The 2015-2016 period witnessed an economic recession and currency crisis that tested bank resilience. By 2019, the CBN increased the CRR to 27.5% and introduced a minimum Loan-to-Deposit Ratio of 60% to stimulate credit to the private sector. The COVID-19 pandemic in 2020-2021 brought regulatory forbearance as the CBN sought to cushion economic disruption. The study period concluded in 2022 with aggressive monetary tightening, as the CRR reached 32.5% and the MPR rose to 15.5%. These sequential changes potentially affected the liquidity risk-performance relationship, justifying the use of fixed effects to control for time-invariant bank heterogeneity and period-specific shocks. These changes potentially affected the liquidity risk-performance relationship, justifying the use of fixed effects to control for time-invariant bank heterogeneity and period-specific shocks.

3.1 Variable Measurement and Model Specification

3.1.1 Dependent Variable

Financial Performance (ROE): Return on Equity is calculated as Net Income divided by Shareholders' Equity, expressed as a percentage. ROE measures how effectively a bank uses equity capital to generate profits and represents shareholders' primary return metric. This study uses ROE as the primary performance indicator following Anande-Kur, Faajir, and Agbo (2020) and consistent with the value creation focus of the Trade-Off Theory.

3.1.2 Independent Variables

Liquidity Risk (LR): Measured using the Total Loan-to-Total Asset Ratio (TLTAR), calculated as Total Loans divided by Total Assets, expressed as a percentage. This ratio indicates the proportion of a bank's assets tied up in loans a key liquidity transformation activity. A higher ratio suggests higher liquidity risk as fewer assets remain readily convertible to cash, but also indicates more active intermediation that may generate higher returns (Ugwu & Okwo, 2021).

Leverage (LEV): Measured using the Total Debt-to-Equity Ratio (TDER), calculated as Total Liabilities divided by Shareholders' Equity. This ratio reflects the extent to which a bank is financed by debt relative to equity, capturing capital structure decisions. A higher ratio indicates higher leverage and financial risk, consistent with the Trade-Off Theory's focus on capital structure optimization (Francis, 2025).

3.1.3 Control Variables

Firm Size (FS): Measured by the natural logarithm of total assets. Larger banks typically enjoy economies of scale, better diversification, and enhanced access to funding sources, which may influence performance independent of liquidity risk or leverage (Alex & Ngaba, 2018).

Earnings Per Share (EPS): Calculated as Net Income divided by Weighted Average Shares Outstanding. EPS captures profitability per share and serves as a market-oriented performance indicator that may correlate with ROE while providing additional explanatory power.

3.2 Model Specification

The study employs a multiple regression model designed to examine the influence of Liquidity Risk and Leverage on financial performance:

$$ROE_{it}=\beta_0+\beta_1 LR_{it}+\beta_2 LEV_{it}+\beta_3 FS_{it}+\beta_4 EPS_{it}+\varepsilon it \text{ ……..i}$$

Where:

- ROE_it = Return on Equity for bank i in year t
- β_0 = Intercept (constant term)
- β_1, β_2, β_3, β_4 = Coefficients for independent and control variables
- LR_it = Liquidity Risk (Total Loan-to-Total Asset Ratio) for bank i in year t
- LEV_it = Leverage (Total Debt-to-Equity Ratio) for bank i in year t
- FS_it = Firm Size (natural log of total assets) for bank i in year t
- EPS_it = Earnings Per Share for bank i in year t
- ε_it = Error term (composite error: ε_it = μ_i + ν_it)
-

The model is estimated using three panel data estimators:

Pooled Ordinary Least Squares (OLS): Assumes homogeneous coefficients across banks and time
Fixed Effects (FE): Controls for time-invariant bank-specific unobserved heterogeneity (μ_i)
Random Effects (RE): Treats bank-specific effects as random draws from population distribution

The Hausman specification test (Hausman, 1978) determines the appropriate estimator by testing whether unobserved effects (μ_i) are correlated with regressors. Rejection of the null hypothesis (random effects consistent) favors fixed effects, indicating that bank-specific characteristics such as management quality, risk culture, and historical asset quality are correlated with liquidity risk, leverage, and performance decisions.

3.3 Diagnostic Tests and Robustness

3.3.1 Normality Testing

The Shapiro-Wilk test assesses whether variables follow Gaussian distributions, which affects inference procedures. For non-normal dependent variables, robust standard errors are employed following Lin and Tu (2020).

3.3.2 Multicollinearity Assessment

Variance Inflation Factors (VIF) examine whether high correlations among independent variables inflate standard errors and obscure true relationships. VIF values below 10 (preferably below 5) indicate acceptable multicollinearity levels (Salmerón et al., 2020).

3.3.3 Heteroscedasticity Testing

The Breusch-Pagan/Cook-Weisberg test examines whether error variances are constant across observations. Detection of heteroscedasticity justifies use of robust standard errors to ensure valid inference.

3.3.4 Data Validation and Ethics

The collected data underwent rigorous cleaning and validation processes. Any anomalies or incomplete data entries were identified and addressed to ensure dataset integrity. The negative minimum leverage value (-2.98) observed in Table 4.1 reflects instances where banks reported negative equity positions, typically following significant loan loss provisions or asset write-downs. This occurred primarily in 2016-2017 during Nigeria's economic recession and currency crisis, when several banks required regulatory forbearance. Rather than excluding these observations, they were retained as they represent genuine financial distress episodes that inform the leverage-performance relationship and enhance the study's external validity across business cycle phases.
The study adheres to ethical research principles by using publicly available secondary data from audited financial statements and regulatory filings, ensuring no confidentiality breaches or privacy concerns.

4. Results and Discussion

4.1 Descriptive Statistics and Data Characteristics

Table 1: presents the descriptive statistics for all variables used in the analysis. The results provide a comprehensive outline of the financial health and performance variability among Nigerian DMBs during 2013-2022.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROE	120	12.250	11.256	-80.040	32.080
LR	120	42.366	10.006	5.720	64.230
LEV	120	7.101	3.002	-2.980	15.960
FS	120	9.300	0.423	8.190	10.200
EPS	120	2.124	2.258	-1.280	8.240

Source: Authors' Computation (2026)

Note: Negative leverage values reflect periods of negative equity due to substantial loan loss provisions, particularly during the 2016–2017 economic downturn.

The mean Return on Equity (ROE) of 12.25% indicates that, on average, DMBs generated moderate returns on equity during the study period. However, the high standard deviation (11.256) and wide range (-80.04% to 32.08%) reveal significant disparities among banks, with some experiencing substantial losses while others achieved strong profitability. This variability reflects the divergent fortunes of D-SIBs versus smaller banks during economic volatility. The mean ROE aligns with post-COVID recovery data showing sector-average ROE improving from 6.5% (2020) to 8.5% (2022) (Central Bank of Nigeria, 2023), suggesting that 2022 represented a transitional recovery year.

Liquidity Risk (LR) averages 42.37% with a standard deviation of 10.01%, indicating moderate variability in liquidity transformation activities. The range (5.72% to 64.23%) suggests that some banks maintained very conservative liquidity positions while others pursued aggressive lending strategies. The mean of 42.37% indicates that Nigerian banks allocated substantial portions of assets to lending activities, consistent with the CBN's 65% minimum loan-to-deposit ratio introduced in 2019 to stimulate private sector credit (U.S. Department of State, 2024).

Leverage (LEV) averages 7.10, reflecting moderate debt-to-equity levels. The standard deviation (3.00) indicates variability in capital structure decisions, including instances of negative equity (minimum -2.98) during distress periods. The maximum leverage of 15.96 suggests that some banks operated with highly leveraged positions, potentially exceeding optimal levels predicted by the Trade-Off Theory.

Firm Size (FS) shows limited variability (SD = 0.42), reflecting the homogeneous nature of listed DMBs following the 2004/2005 consolidation. EPS displays high variability (SD = 2.26, range -1.28 to 8.24), indicating divergent profitability per share across banks and time periods.

4.2 Diagnostic Test Results

4.2.1 Normality Testing

Table 2: presents the Shapiro-Wilk test results for normality assessment.

Table 2: Shapiro-Wilk Test for Data Normality

Variable	Obs	W	z	p-value
ROE	120	0.676	7.706	0.000
LR	120	0.980	1.430	0.076
LEV	120	0.930	4.263	0.000
FS	120	0.987	0.432	0.333
EPS	120	0.846	6.036	0.000

Source: Authors' Computation (2026)

Note: ROE, LEV, and EPS significantly deviate from normality ($p < 0.05$). This justifies the use of robust standard errors in panel estimation to correct for potential violations of classical assumptions.

The results indicate that ROE (Prob>z = 0.000), LEV (Prob>z = 0.000), and EPS (Prob>z = 0.000) do not follow normal distributions. However, LR (Prob>z = 0.076) and FS (Prob>z = 0.333) are normally distributed at conventional significance levels. The non-normality of the dependent variable and key independent variables necessitates careful interpretation of probability statistics and supports the use of robust standard errors in panel regression estimation (Lin & Tu, 2020).

4.3 Correlation Analysis

Table 3: presents the Spearman rank correlation coefficients examining bivariate associations among variables.

Table 3. Correlation Analysis

Variables	ROE	LR	LEV	FS	EPS
ROE	1.000				
LR	-0.099	1.000			
LEV	-0.082	0.162	1.000		
FS	0.442	-0.170	0.286	1.000	
EPS	0.597	-0.277	-0.097	0.675	1.000

Source: Authors' Computation (2026)

Note: Spearman correlation is used due to non-normality. No correlation exceeds 0.80, indicating absence of multicollinearity concerns.

The correlation results reveal several notable patterns. Liquidity Risk (LR) shows a weak negative association with ROE (coefficient = -0.099), suggesting that higher loan-to-asset ratios are marginally associated with lower returns. However, this bivariate relationship reverses in multivariate analysis (see Table 4.4), indicating that controlling for firm size and EPS reveals the true positive effect of liquidity transformation. Leverage (LEV) also shows a weak negative association with ROE (coefficient = -0.082), consistent with the Trade-Off Theory's prediction that debt financing costs may outweigh benefits at observed levels.

Control variables display expected associations: Firm Size (FS) positively correlates with ROE (coefficient = 0.442), supporting the view that larger banks enjoy scale economies and diversification benefits. EPS strongly positively correlates with ROE (coefficient = 0.597), reflecting the inherent relationship between per-share profitability and return on equity. The moderate correlation between FS and EPS (0.675) suggests that larger banks tend to generate higher earnings per share, but multicollinearity does not appear problematic.

4.4 Regression Analysis Results

4.4.1 Multivariate Panel Regression Estimates

Table 4: presents the main regression results using pooled OLS, fixed effects (FE), and random effects (RE) estimators.

The regression results reveal several critical findings. First, the F-statistics for all models are statistically significant at the 1% level ($p = 0.000$), indicating that the independent variables jointly explain variation in ROE. The pooled OLS model achieves $R^2 = 0.375$, suggesting that 37.5% of ROE variation is explained by the model. However, the fixed effects model shows lower $R^2 = 0.155$, indicating that between-bank variation (captured by OLS) explains more variance than within-bank temporal variation. This pattern is common in banking panels where bank-specific characteristics (management quality, risk culture, historical positioning) are more important than time-series variation in explaining performance differences.

Table 4: Multivariate Regression Analysis

Variables	(1) OLS	(2) FE	(3) RE
LR	0.090 (0.372)	0.132*** (0.000)	0.090 (0.372)
LEV	-0.327 (0.339)	-1.351** (0.007)	-0.327 (0.339)
FS	3.270 (0.290)	7.787 (0.240)	3.270 (0.290)
EPS	2.616*** (0.000)	1.462* (0.087)	2.616*** (0.000)
Constant	-25.823 (0.352)	-59.581 (0.315)	-25.823 (0.352)
Observations	120	120	120
R^2	0.375	0.155	0.071
F-statistic	67.57***	54.41***	67.57***
p-value	(0.000)	(0.000)	(0.000)
hettest = 67.57, p = 0.000 VIF: 1.99 Hausman: = 54.41, p = 0.000			

Notes: p-values are reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10
Source: Authors' Computation (2026)

The Hausman specification test yields $\chi^2(4) = 54.41$ ($p = 0.000$), decisively rejecting the null hypothesis that the random effects estimator is consistent. This indicates that bank-specific unobserved heterogeneity is correlated with regressors, making fixed effects the appropriate estimator. The result implies that unobserved characteristics such as risk management culture, management quality, and historical asset quality are correlated with liquidity risk, leverage, and performance decisions a realistic assumption in banking where these factors drive strategic choices.

4.5 Hypothesis Testing and Interpretation

H01: Liquidity Risk has no significant effect on the financial performance of listed Deposit Money Banks in Nigeria.

The fixed effects results reject this hypothesis. Liquidity Risk demonstrates a positive and statistically significant effect on ROE (coefficient = 0.132, p = 0.000). This finding indicates that a one percentage point increase in the loan-to-asset ratio is associated with a 0.132 percentage point increase in ROE, holding other factors constant. The result suggests that during 2013-2022, Nigerian banks successfully transformed liquidity risk into profitability through effective intermediation aligning with the Financial Intermediation Theory's prediction that liquidity transformation creates value when managed appropriately.

This positive effect appears counterintuitive to traditional liquidity management principles but aligns with recent Nigerian evidence. Ugwu and Okwo (2021) similarly found that Loan-to-Deposit Ratio positively affects ROE, concluding that "the more active the banks are in lending, the higher their returns. The finding suggests that Nigerian banks during this period operated below the optimal liquidity risk threshold, where the marginal revenue from lending exceeded the marginal cost of liquidity risk. This may reflect the high-yield environment

in Nigeria, where lending rates (averaging 15-25%) substantially exceeded funding costs, making aggressive intermediation profitable despite higher liquidity risk.

H02: Leverage has no significant impact on the financial performance of listed Deposit Money Banks in Nigeria.

The fixed effects results reject this hypothesis. Leverage demonstrates a negative and statistically significant effect on ROE (coefficient = -1.351, p = 0.007). This finding indicates that a one-unit increase in the debt-to-equity ratio is associated with a 1.351 percentage point decrease in ROE, holding other factors constant. The result strongly supports the Trade-Off Theory's prediction that excessive leverage reduces profitability as financial distress costs outweigh tax benefits.

The negative leverage effect aligns with recent Nigerian evidence. Francis (2025) found that long-term debt-to-assets ratio significantly negatively affected ROA in Nigerian banks, supporting the view that banks should prioritize short-term funding over long-term debt. The finding also connects to Nigeria's 2024-2026 recapitalization program, which raised ₦4.65 trillion (72.55% from domestic investors) to strengthen equity bases precisely because excessive leverage had constrained performance (Central Bank of Nigeria, 2023; Premium Times, 2026).

5. Discussion of Findings

5.1 The Asymmetric Risk-Performance Relationship

The study's core finding is the asymmetric relationship between the two risk dimensions and financial performance: liquidity risk positively affects ROE while leverage negatively affects ROE. This asymmetry has important theoretical and practical implications. The positive liquidity risk effect suggests that Nigerian banks during 2013-2022 operated as effective financial intermediaries, transforming liquidity risk into profitability through quality lending. This finding supports the Acharya-Naqi framework's "effective liquidity management" concept and aligns with the Financial Intermediation Theory's view that banks create value through maturity transformation. The result implies that regulatory constraints on lending (such as the CBN's liquidity ratio requirements) may inadvertently reduce profitability if set too conservatively, particularly in high-yield environments where lending spreads are substantial.

However, this positive relationship likely has limits. The CBN's 2022 Financial Stability Report noted that while banks-maintained liquidity ratios above prudential minimums, rising interest rates (MPR at 15.5%) increased funding costs, potentially constraining future profitability (Central Bank of Nigeria, 2023). Additionally, Ugwu and Okwo (2021) found that Cash Reserve Ratio and Liquidity Coverage Ratio showed negative (though insignificant) effects on ROE, suggesting that regulatory liquidity requirements may dampen performance at higher levels.

The negative leverage effect provides strong empirical support for the Trade-Off Theory in Nigerian banking. The coefficient of -1.351 indicates that leverage costs substantially outweigh benefits at observed levels, suggesting that banks operated beyond the optimal capital structure. This finding connects to Nigeria's structural economic challenges: high inflation (reaching 21.09% in October 2022), currency volatility, and sovereign debt concerns increased the risk premium on bank funding, raising the marginal cost of debt. The result justifies the CBN's 2024-2026 recapitalization initiative, which mandated significant equity injections to reduce leverage ratios and strengthen financial resilience.

5.2 Regulatory and Policy Implications

The findings carry significant implications for regulatory policy and bank management in Nigeria and similar emerging markets.

5.2.1 For Regulatory Policymakers

The asymmetric findings suggest that liquidity regulation and capital regulation have differential impacts on bank performance. While the CBN's liquidity requirements (30% liquidity ratio, 32.5% CRR by 2022) may constrain lending and profitability, the documented negative leverage effect indicates that capital adequacy requirements addressing excessive leverage are warranted. Regulators should consider counter-cyclical liquidity buffers that adjust with economic cycles reducing constraints during downturns to support credit flow while maintaining buffers during expansions to prevent excessive risk-taking.

The findings also support differentiated supervision of systemically important banks. The five D-SIBs (controlling 59% of assets) likely drive the positive liquidity risk finding, as their scale enables better risk management and diversification. Enhanced supervision of these institutions should focus on leverage constraints rather than liquidity restrictions, given their intermediation efficiency.

5.2.2 For Bank Management

The results suggest that Nigerian banks should prioritize equity financing over debt financing, consistent with the Pecking Order Theory's hierarchy. The negative leverage coefficient (-1.351) indicates that reducing leverage by one unit could increase ROE by 1.35 percentage points a substantial improvement. Banks should strengthen equity bases and reduce reliance on expensive wholesale funding.

Conversely, banks should not fear liquidity risk per se but manage it actively. The positive liquidity risk coefficient suggests that aggressive but prudent lending enhances profitability. This requires robust credit risk management, diversified loan portfolios, and dynamic liquidity forecasting to ensure that intermediation activities remain profitable without jeopardizing solvency.

5.2.3 For Investors

The findings provide guidance for bank valuation and investment decisions. Investors should favor banks with moderate leverage (below the sample mean of 7.10) and active but well-managed lending programs. The negative leverage effect suggests that highly leveraged banks face profitability headwinds, while the positive liquidity risk effect indicates that conservative, low-lending banks may underperform. The optimal investment target appears to be banks with strong equity bases and efficient intermediation capabilities.

5.2.4 Comparison with Prior Studies

The findings both corroborate and contradict prior Nigerian studies, reflecting temporal and methodological differences. The positive liquidity risk finding aligns with Ugwu and Okwo (2021) and Andabai and Oyakegha (2024), who found that active lending enhances profitability. However, it contradicts Olagunju et al. (2020) and Owolabi and Alu (2019), who found negative or trade-off relationships. These differences likely reflect the study

period: this paper's 2013-2022 window includes the high-yield post-recession recovery (2017-2019) and COVID-19 volatility, whereas earlier studies covered different macroeconomic conditions.
The negative leverage finding strongly corroborates Francis (2025), who found that long-term debt negatively affects ROA, and contrasts with Adebiyi and Fakorede (2019), who found positive leverage effects using pre-2020 data. The divergence likely reflects the 2020-2022 period of monetary tightening and economic stress, which increased the costs of debt financing and highlighted the risks of excessive leverage. This temporal variation underscores the importance of updating empirical evidence as regulatory and macroeconomic conditions evolve.

5.2.5 Limitations and Future Research Directions

This study has several limitations that suggest avenues for future research. First, the 2013-2022 period, while comprehensive, excludes subsequent regulatory developments. Future research should examine how evolving monetary policy and capital requirements alter the liquidity-leverage-performance nexus.
Second, the study treats all 15 listed DMBs as homogeneous, yet the five D-SIBs differ substantially from smaller banks in scale, diversification, and market power. Future research should employ quantile regression or sub-sample analysis to examine whether the asymmetric risk effects vary by bank size and systemic importance.
Third, the study focuses on accounting performance (ROE) rather than market performance (stock returns, Tobin's Q). Future research should examine whether the asymmetric risk effects extend to market valuations, particularly relevant for investor decision-making. Fourth, the study does not explicitly model the COVID-19 shock and recovery dynamics. Future research should employ difference-in-differences or intervention analysis to assess how the pandemic and regulatory forbearance altered the risk-performance relationship.

5.3 Conclusion

This study investigated the impact of liquidity risk and leverage on the financial performance of listed Deposit Money Banks in Nigeria from 2013 to 2022, a period characterized by significant regulatory evolution, economic volatility, and the COVID-19 pandemic. Utilizing panel data from all 15 listed Deposit Money Banks and employing fixed effects regression, the study reveals an asymmetric risk-performance relationship with important theoretical and policy implications. The key findings indicate that liquidity risk positively and significantly affects return on equity with a coefficient of 0.132 and a p-value of 0.000, demonstrating that effective liquidity transformation enhances profitability. This finding supports the Financial Intermediation Theory and aligns with recent evidence that active lending generates returns exceeding liquidity costs in the Nigerian context. Conversely, leverage negatively and significantly affects return on equity with a coefficient of negative 1.351 and a p-value of 0.007, indicating that excessive debt financing reduces profitability. This finding strongly supports the Trade-Off Theory's prediction that financial distress costs outweigh tax benefits at observed leverage levels. The Hausman test favors fixed effects with a chi-square value of 54.41 and a p-value of 0.000, indicating that bank-specific unobserved heterogeneity is correlated with risk and performance decisions, which underscores the importance of controlling for management quality and risk culture in banking studies. The control variables perform as expected, with firm size and earnings per share positively associated with return on equity, consistent with scale economy and profitability theories. These findings contribute to emerging market banking literature by providing empirical evidence from Africa's largest economy during a period of regulatory intensification and post-pandemic recovery. The asymmetric risk effects, being positive for liquidity risk and negative for leverage, offer nuanced guidance for bank management and regulatory policy in similar contexts.

Based on these findings, several recommendations emerge for regulatory policymakers, bank management, and investors. For regulatory policymakers, the asymmetric findings suggest that liquidity regulation and capital regulation have differential impacts on bank performance. While the Central Bank of Nigeria's liquidity requirements, including the 30 percent liquidity ratio and the 32.5 percent cash reserve ratio by 2022, may constrain lending and profitability, the documented negative leverage effect indicates that capital adequacy requirements addressing excessive leverage are warranted. Regulators should consider counter-cyclical liquidity buffers that adjust with economic cycles, reducing constraints during downturns to support credit flow while maintaining buffers during expansions to prevent excessive risk-taking. The findings also support differentiated supervision of systemically important banks, as the five domestic systemically important banks controlling 59 percent of assets likely drive the positive liquidity risk finding given their scale enables better risk management and diversification. Enhanced supervision of these institutions should focus on leverage constraints rather than liquidity restrictions, given their intermediation efficiency. Additionally, given the interaction between monetary policy and bank performance, the Central Bank of Nigeria should conduct regular stress testing to assess how liquidity requirements affect lending capacity and economic growth.

For bank management, the results suggest that Nigerian banks should prioritize equity financing over debt financing, consistent with the Pecking Order Theory's hierarchy. The negative leverage coefficient of negative 1.351 indicates that reducing leverage by one unit could increase return on equity by 1.35 percentage points, a substantial improvement. Banks should strengthen equity bases and reduce reliance on expensive wholesale funding. Conversely, banks should not fear liquidity risk per se but manage it actively. The positive liquidity risk coefficient suggests that aggressive but prudent lending enhances profitability. This requires robust credit risk management, diversified loan portfolios, and dynamic liquidity forecasting to ensure that intermediation activities remain profitable without jeopardizing solvency. The asymmetric findings suggest that liquidity risk and leverage require different management approaches, and banks should adopt differentiated risk appetites that are moderate for leverage given its negative effects and moderately aggressive for liquidity risk given its positive effects, subject to regulatory minima. Furthermore, given the importance of firm-specific factors captured by fixed effects, banks should improve risk disclosure to enable investors and regulators to assess liquidity and leverage positions accurately.

For investors, the findings provide guidance for bank valuation and investment decisions. Investors should favor banks with moderate leverage below the sample mean of 7.10 and active but well-managed lending programs. The negative leverage effect suggests that highly leveraged banks face profitability headwinds, while the positive liquidity risk effect indicates that conservative low-lending banks may underperform. The optimal investment target appears to be banks with strong equity bases and efficient intermediation capabilities. Investors should also evaluate liquidity management efficiency, as banks with high loan-to-asset ratios and strong asset quality, reflected in low non-performing loans, likely offer superior risk-adjusted returns. Banks meeting the Central Bank of Nigeria's 65 percent loan-to-deposit ratio minimum while maintaining strong capital adequacy demonstrate effective risk management and regulatory navigation capabilities.

This study makes three contributions to the banking and finance literature. The theoretical contribution integrates the Trade-Off Theory, Pecking Order Theory, and Financial Intermediation Theory to explain the liquidity-leverage-performance nexus in emerging markets. This synthesis provides a more comprehensive theoretical foundation than prior studies relying on single frameworks, demonstrating how capital structure and liquidity transformation theories interact in banking contexts. The empirical contribution provides updated evidence from Africa's largest economy during a critical period from 2013 to 2022 encompassing regulatory intensification, economic recession, COVID-19 disruption, and initial recovery. The asymmetric risk findings, with a positive liquidity risk effect versus a negative leverage effect, offer nuanced insights that challenge conventional wisdom

about risk management in banking. The policy contribution connects empirical findings on leverage and liquidity to broader capital structure policy in Nigerian banking. The documented negative leverage effect provides evidence-based support for equity-strengthening initiatives, while the positive liquidity risk effect highlights the need for balanced liquidity regulation that does not unduly constrain intermediation.

The Nigerian banking sector stands at a critical juncture following significant regulatory evolution and amid ongoing economic challenges including inflation, currency volatility, and fiscal pressures. This study's findings underscore the importance of balanced risk management, where liquidity risk, when actively managed through quality lending, enhances profitability, while leverage, when excessive, undermines performance through financial distress costs. The asymmetric risk-performance relationship documented herein offers a roadmap for navigating this complex environment. Banks that strengthen equity bases, optimize liquidity transformation, and maintain prudent risk cultures will be best positioned to deliver sustainable returns while contributing to Nigeria's economic development. Regulators that differentiate liquidity and capital requirements, adapting to bank size and economic conditions, can enhance both sector stability and performance. As emerging market banking systems globally confront similar challenges, including regulatory intensification, digital disruption, and climate transition, the Nigerian experience documented in this study offers valuable lessons for balancing risk management with value creation in dynamic financial environments.

Declaration

The authors declare that this manuscript is an original work and has not been published or submitted for publication elsewhere.

Acknowledgment: The authors sincerely acknowledge the Journal of Social Sciences and Management Studies for considering and publishing this study.

Funding: No funding was received from any individual, organization, or agency for the conduct and publication of this research.

Conflict of interest: The authors declare that there is no conflict of interest regarding the publication of this paper.

Ethics approval/declaration: The research was conducted in accordance with institutional and national ethical standards. The study uses publicly available secondary data from audited financial statements and regulatory filings, ensuring no confidentiality breaches or privacy concerns.

Consent to participate: All authors consented to participate in the research and contributed to the study.

Consent for publication: All authors have given their full consent for the publication of this manuscript.

Data availability: The data used for the analysis in this study are available with the corresponding author upon reasonable request.

Authors' contribution: Yusuf Ahmed Tijjani is the corresponding author and PhD candidate who conceptualized the study, conducted the data analysis, and drafted the manuscript. Dr. Hauwa'u Sani provided critical review and methodological guidance. Dr. Mahmud Sani Madobi served as principal supervisor, providing overall academic direction and editorial oversight. All authors read and approved the final manuscript.

References

Acharya, V. V., & Naqvi, H. (2012). The seeds of a crisis: A theory of bank liquidity and risk taking over the business cycle. *Journal of Financial Economics*, *106*(2), 349–366.

Adesina, J. B., Nwidobie, B. M., & Adesina, O. O. (2015). Capital structure and financial performance in Nigeria. *International Journal of Business and Social Research*, *5*(2), 21–31.

Ahmed, A., et al. (2021). Interactions between liquidity management, bank size, and financial performance among Nigerian banks. *Journal of Banking and Finance Research*, *15*(3), 45–62.

Alex, M. K., & Ngaba, D. (2018). Effect of firm size on financial performance on banks: Case of commercial banks in Kenya. *International Academic Journal of Economic & Finance*, *3*(1), 175–190.

Andabai, P. W., & Oyakegha, E. S. (2024). Liquidity management and commercial banks' performance in Nigeria. *International Journal of Social Sciences and Management Research*, *10*(9), 288–297.

Anande-Kur, F., Faajir, A., & Agbo, A. (2020). Determinants of bank financial performance: A study of Nigerian deposit money banks. *China-USA Business Review*, *19*(4), 103–114.

Arzova, S. B., & Sahin, B. S. (2023). The effect of financial soundness variables on bank performance: A macro-level analysis in MSCI Emerging Market Index Countries. *Kybernetes*.

Azzabi, A., & Lahrichi, Y. (2024). Commercial banks' performance in emerging markets: New evidence from the MENAP region. *Academy of Banking and Finance Studies Journal*, *23*(1), 78–95.

Basel Committee on Banking Supervision. (2019). *Basel III: Finalising post-crisis reforms*. Bank for International Settlements.

Berger, A. N., & Bouwman, C. H. S. (2013). How does capital affect bank performance during financial crises? *Journal of Financial Economics*, *109*(1), 146–176.

Central Bank of Nigeria. (2021). *Financial stability report 2020*.

Central Bank of Nigeria. (2023). *Financial stability report 2022*.

Central Bank of Nigeria. (2023). *Monetary policy decisions (Various MPC Meetings 2013–2022)*. Abuja: CBN.

Diamond, D. W., & Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*, *91*(3), 401–419.

Efobi, C. A. (2022). *Financial system review*. Central Bank of Nigeria.

Francis, C. (2025). Financial leverage and commercial banks performance in Nigeria. *International Journal of Banking and Finance Research*, *8*(5), 19–32.

Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: Which factors are reliably important? *Financial Management*, *38*(1), 1–37.

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica*, *46*(6), 1251–1271.

International Monetary Fund. (2018). *Understanding monetary policy in Nigeria* (IMF Working Paper No. 18/64).

Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *Journal of Finance*, *28*(4), 911–922.

Lin, Y., & Tu, Y. (2020). Robust inference for spurious regressions and co-integrations involving processes moderately deviated from a unit root. *Journal of Econometrics*, *219*(1), 52–65.

Mwajombe, A. R. (2016). *The effect of financial leverage on commercial banks profitability in Tanzania* [Master's thesis, The Open University of Tanzania].

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221.

Ogolugbo, B. G. (2021). *Basel III: Highlights of the experiences of Nigeria, Kenya, and South Africa on the introduced liquidity (HQLA) regulations* [Doctoral dissertation, University of Leeds].

Olagunju, A., Adekoya, O., & Oluwadare, O. (2020). Impact of liquidity risk on the profitability of listed banks in Nigeria. *African Journal of Business Management*, *14*(8), 267–278.

Owolabi, S., & Alu, N. (2019). Effect of liquidity risk on the financial stability of deposit money banks in Nigeria. *Journal of Financial Regulation and Compliance*, *27*(4), 512–528.

Salmerón, R., García, C. B., & García, J. (2020). Overcoming the inconsistences of the variance inflation factor: A redefined VIF and a test to detect statistical troubling multicollinearity. *arXiv*.

Somoye, R. O., Ilo, B. M., & Yunusa, L. A. (2019). Interest income and deposit money banks (DMBs) performance in Nigeria. *Economic Review – Journal of Economics and Business*, *17*(2), 15–26.

Ugwu, P., & Okwo, I. M. (2026). Effect of liquidity risk on the profitability of commercial banks in Nigeria. *European Journal of Business and Innovation Research*, *14*(1), 204–218.

U.S. Department of State. (2024). *2024 investment climate statements: Nigeria*.

Yunusa, A., Ekundayo, O. O., & Orshi, T. S. (2019). The determinants of survival of listed deposit money banks (DMBs) in Nigeria. *NDIC Quarterly*, *34*(12), 45–58.

How to cite this article:

Ahmed Tijjani, Y., Sani, H., & Sani Madobi, M. (2026). Liquidity Risk, Capital Structure, and Financial Performance: A Panel Analysis of Nigerian Deposit Money Banks (2013-2022). Journal of Social Sciences and Management Studies, 5(1). https://doi.org/10.56556/jssms.v5i1.1454