

# Risk Management and Profitability of Quoted Deposit Money Banks in Nigeria

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## Article History

Received: 21 / 02 / 2026

Accepted: 11 / 03 / 2026

Published: 22 / 03 / 2026

## Author:

**Abstract:** Profitability remains a critical concern for deposit money banks in Nigeria due to increasing exposure to financial risks and regulatory pressures. This study examined the effect of risk management on the profitability of quoted deposit money banks in Nigeria, with specific focus on credit risk, liquidity risk, and operational risk. The study employed panel data covering 2015-2024 firms and Return on Assets (ROA) was used as a proxy for profitability. Credit risk, liquidity risk, and operational risk served as the explanatory variables. Descriptive statistics, correlation analysis, and panel regression techniques were applied in the analysis. Diagnostic tests, including the Hausman specification test, Variance Inflation Factor (VIF), Breusch-Pagan heteroskedasticity test, and normality tests, were conducted to ensure robustness of the results. The Hausman test supported the use of the Random Effects Model, while the presence of heteroskedasticity necessitated the use of heteroskedasticity-robust standard errors. The findings revealed that liquidity risk has a statistically significant negative effect on profitability, indicating that inefficient liquidity management reduces banks' earning capacity. Credit risk and operational risk were found to have statistically insignificant effects on profitability within the study period. The study concludes that effective liquidity management is central to enhancing profitability of quoted deposit money banks in Nigeria. It recommends strengthening liquidity monitoring frameworks, improving asset-liability management strategies, and sustaining prudent risk management practices to ensure financial stability and sustainable bank performance.

**Keywords:** Risk management, credit risk, liquidity risk, operational risk, profitability, return on assets, deposit money banks, Nigeria.

**How to Cite in APA format:** ADEDIRAN, S. A. & NASIRU, Y. (2026). Risk Management and Profitability of Quoted Deposit Money Banks in Nigeria. *IRASS Journal of Economics and Business Management*. 3(3), 37-51.

## Introduction

Profitability remains the lifeblood of any banking institution, serving as a barometer of operational efficiency, strategic foresight, and long-term viability. In the Nigerian banking sector, where deposit money banks (DMBs) listed on the Nigerian Exchange Group (NGX) dominate financial intermediation, profitability metrics—such as return on assets (ROA), return on equity (ROE), and net interest margins—have fluctuated dramatically amid economic volatility. For instance, aggregate after-tax profits of NGX-listed DMBs surged by over 200% from N1.35 trillion in 2021 to N3.48 trillion in 2023, driven by digital transformation and high interest rates, yet these gains mask underlying vulnerabilities exposed by non-performing loans (NPLs) averaging 4.5-5% in recent years (Central Bank of Nigeria, 2024 reports). This paradox underscores a fundamental truth: unchecked risks can erode even the most impressive profit streams, transforming short-term windfalls into existential threats.

At the heart of this dynamic lie risk management—the systematic identification, assessment, mitigation, and monitoring of financial, operational, credit, market, and liquidity risks. In Nigeria's banking arena, characterized by macroeconomic headwinds like inflation exceeding 30%, naira devaluation, oil price shocks, and regulatory reforms under the CBN's recapitalization directives (e.g., the 2024 minimum capital requirements of N500 billion for international banks), robust risk frameworks are not merely compliance exercises but strategic imperatives for profitability. Empirical evidence from global

studies, such as those by the Basel Committee on Banking Supervision, reinforces this linkage: banks with advanced risk management practices report 15-20% higher ROE during stress periods. Locally, analyses of Nigerian DMBs like Zenith Bank, GTBank, and Access Holdings reveal that superior risk-adjusted capital ratios correlate with sustained earnings growth, while lapses—evident in the 2009 banking crisis that wiped out N4.5 trillion in assets—precipitate profit collapses.

This study delves into the nexus between risk management and profitability among NGX-listed DMBs from 2015-2024, a period bookended by the COVID-19 disruptions and the ongoing recapitalization era. By employing econometric models like panel data regression and the Altman Z-score for distress prediction, it examines how variables such as credit risk provisioning, liquidity coverage ratios, and operational risk adoption influence key profitability indicators. The findings promise actionable insights for bank executives, regulators, and policymakers, illuminating pathways to resilience in an economy projected to grow at 3.5% in 2026 (IMF estimates). Ultimately, mastering risk is not just about survival, it's the cornerstone of profitable dominance in Nigeria's fiercely competitive banking sector.

## Statement of Problem

Profitability, as the dependent variable in this study, encapsulates critical metrics like return on assets (ROA), which gauge a bank's capacity to generate returns from its assets, equity



base, lending spreads, and shareholder value amid operational costs and risks. In Nigeria's deposit money banks (DMBs), these indicators have shown resilience posting record aggregate profits of N3.48 trillion in 2023 yet they remain perilously vulnerable to multifaceted risks that amplify provisioning costs, erode capital buffers, and trigger sharp profit contractions.

High non-performing loans (NPLs) exemplify credit risk's toll on profitability; First Holdco (parent of First Bank) reported N1.23 trillion in NPLs in 2024 a 211% surge driving its NPL ratio to 12.9% in H1 2025 and slashing profit after tax by 22.3% year-on-year to N283.77 billion, while Zenith Bank's NPLs hit N516.71 billion despite loan book growth. Operational failures compound this, as seen in historical cases like Allied Bank of Nigeria's collapse due to weak internal controls, fraud exceeding N1.6 billion, and poor credit assessments, mirroring persistent issues where cost-to-income ratios inflate and NIMs shrink.

Liquidity crises further imperil ROA and ROE; Nigeria's banking liquidity plummeted to \$94.2 million in Q4 2024 from \$123 million in 2022, forcing reliance on CBN's Standing Lending Facility at \$29.1 billion amid 27.5% policy rates, stalling credit expansion and heightening funding costs. Cyber-attacks have escalated dramatically, with a 153% surge in incidents on financial institutions from 2020-2024, ransomware up 287%, and banks losing N53.4 billion to fraud in early 2024 alone; recent 2025 breaches targeted entities like Princececs Credit Systems via Killsec ransomware, disrupting platforms and inflating operational losses that directly dent EPS.

Poor corporate governance exacerbates these risks, fostering insider abuses, unethical lending, and board failures—as in the 2009 crisis with 61% NPLs and \$13.3 billion toxic assets leading to eight CEO sackings—persisting in non-compliance with CBN codes on board independence and risk oversight. Recent scholarship underscores this risk-profitability nexus: Ajanaku et al. (2025) in the *International Journal of Research and Innovation in Social Science* found credit and operational risks significantly determine NIM in Nigerian DMBs (2012-2021); Eke and Adegboyegun (2025) in the *International Journal of Accounting and Financial Reporting* showed operating risk positively impacts ROA in 11 listed DMBs (2014-2023); while Okafor et al. (2025) in the *African Journal of Economics and Business Analysis* confirmed risk management's positive effect on DMB performance; and Njoku (2024) linked financial risks to ROA declines across 13 banks.

Despite these insights, a critical research gap endures prior studies predominantly employ aggregate or static analyses, overlooking dynamic panel models to dissect bank-specific interactions between integrated risk frameworks (credit, operational, liquidity,)and profitability amid shocks like recapitalization. This study addresses that void through targeted econometric scrutiny of NGX-listed DMBs, offering fresh, actionable evidence for resilient profitability.

### Objectives of the Study

The main objective of this study is to examine the effect of risk management on profitability in the Nigerian banking sector. The specific objectives include:

1. determine the extent to which credit risk management influences the profitability of Nigerian banks.

2. examine the relationship between liquidity risk management and banks' financial performance and.
3. assess how operational risk management affects profitability of Nigerian banks.

### Research Hypotheses

The following hypotheses are formulated in line with the research objectives:

- Ho1: Credit risk management has no significant effect on the profitability of Nigerian banks.
- Ho2: Liquidity risk management has no significant effect on the profitability of Nigerian banks.
- Ho3: Operational risk management has no significant effect on the profitability of Nigerian banks.

### Scope of the Study

Profitability in Nigeria's banking sector hinges on precise, targeted analysis of leading players amid escalating risks this study strategically narrows to 12 NGX-listed Deposit Money Banks (DMBs), capturing 95% of sector assets for maximum empirical rigor and supervisory appeal. Geographic and institutional focus the study encompasses all NGX-listed DMBs headquartered in Nigeria, with operations spanning the nation's six geopolitical zones. Analysis covers 2015-2024, a pivotal Ten -year window bookended by the post-COVID recovery (2018 baseline stability). This period captures critical shocks: 2020 pandemic-induced NPL spikes, 2023 naira redesign liquidity crunch, 2024 FX unification volatility, enabling robust trend detection in profitability-risk dynamics.

## Review of Related Literature

### Conceptual Review

#### *Profitability (Dependent Variable)*

Profitability refers to the ability of a bank to generate earnings from its financial resources over a specified period. It represents an important indicator of financial performance and managerial efficiency within banking institutions. A profitable banking system contributes significantly to financial stability, economic growth, and investor confidence.

Profitability in the banking industry is influenced by several internal and external factors, including risk management practices, asset quality, operational efficiency, capital adequacy, and macroeconomic conditions. Banks that effectively manage financial risks tend to achieve higher levels of profitability because they can minimize financial losses and maximize income from their operations.

Empirical banking studies frequently measure profitability using financial ratios such as Return on Assets (ROA) and Return on Equity (ROE). Among these measures, Return on Assets is widely used because it reflects the efficiency with which banks utilize their total assets to generate profit. Return on Assets (ROA) is one of the most commonly used indicators of bank profitability. It measures the ability of a bank to generate net income from its total asset base. ROA evaluates how efficient management utilizes the bank's resources to produce earnings. A higher ROA indicates that a bank is effectively utilizing its assets to generate profits, whereas a lower ROA suggests inefficiency in asset utilization and potential exposure to financial risks. ROA is widely used in

banking studies because it captures the overall profitability and operational efficiency of financial institutions (Yusuf, 2019).

Within the Nigerian banking sector, ROA is frequently adopted in empirical research to evaluate the effect of risk management practices on bank performance.

#### ***Credit Risk (Independent Variable)***

Credit risk is considered the most significant risk faced by banks because lending activities constitute the primary source of bank income. Credit risk refers to the possibility that borrowers or counterparties may fail to meet their financial obligations in accordance with agreed loan terms.

Banks generate revenue primarily through interest income obtained from loans and advances. However, when borrowers default on loan repayments, banks experience financial losses that may significantly reduce profitability. Credit risk therefore arises from the potential failure of borrowers to repay principal and interest on loans as agreed.

Credit risk is commonly measured using indicators such as the Non-Performing Loan (NPL) ratio, loan loss provisions, and expected credit losses. High levels of non-performing loans indicate poor asset quality and ineffective credit risk management, which can adversely affect bank profitability.

Studies have shown that credit risk has a significant impact on the financial performance of banks. When non-performing loans increase, banks are forced to make higher loan loss provisions, thereby reducing net income and profitability. Conversely, effective credit risk management enhances asset quality and improves financial performance (Hendriady de Keizer et al., 2022; Saleh & Winarso, 2021).

Recent studies on Nigerian banks also reveal that rising credit risk, particularly through the growth of non-performing loans, significantly undermines bank profitability and financial performance (Ogundele & Nzama, 2025).

#### ***Operational Risk (Independent Variable)***

Operational risk refers to the risk of financial loss resulting from inadequate or failed internal processes, human errors, system failures, or external events. Unlike credit and liquidity risks, operational risk arises primarily from internal operational weaknesses within banking institutions.

Operational risk may arise from various sources including fraud, technological failures, poor internal controls, cyber-attacks, employee misconduct, and process inefficiencies. With the increasing adoption of digital banking and financial technology, operational risk has become more significant in modern banking systems.

Operational risk management involves implementing effective internal control systems, improving staff training, strengthening risk monitoring mechanisms, and investing in reliable technological infrastructure. Effective operational risk management helps reduce financial losses and enhances operational efficiency.

Scholars argue that operational risk has a direct impact on bank profitability because operational failures can lead to financial losses, reputational damage, and regulatory sanctions (Thair & Adib, 2022).

Furthermore, operational inefficiencies can increase operating costs and reduce overall bank performance, thereby affecting profitability.

#### ***Liquidity Risk (Independent Variable)***

Liquidity risk refers to the possibility that a bank may be unable to meet its short-term financial obligations when they fall due without incurring significant losses. Banks must maintain sufficient liquid assets to satisfy withdrawal demands from depositors and meet other financial commitments.

Liquidity risk arises when there is a mismatch between a bank's short-term liabilities and its available liquid assets. If a bank cannot easily convert its assets into cash or obtain funding from financial markets, it may experience liquidity shortages that threaten its financial stability. Effective liquidity management ensures that banks maintain an appropriate balance between liquidity and profitability. Holding excessive liquidity may reduce income-generating opportunities, while insufficient liquidity may expose banks to financial distress. Liquidity risk has been identified as a major determinant of bank profitability because inadequate liquidity management can lead to increased borrowing costs, regulatory penalties, and reduced investor confidence. Studies indicate that banks with high liquidity risk often experience reduced profitability due to increased funding costs and liquidity pressures (Chen et al., 2018; Sari, Alfarisi & Adrianto, 2022).

Within the Nigerian banking environment, maintaining adequate liquidity levels is particularly important because it ensures the ability of banks to meet depositor withdrawals and sustain operational activities.

#### **Theoretical Review**

Theoretical underpinnings provide a robust scaffold for examining risk management and profitability in Nigerian deposit money banks (DMBs), anchoring empirical analysis in established paradigms that elucidate the risk-profitability nexus. This review dissects four pivotal theories namely, Risk-Return Tradeoff, Agency Theory, Liquidity Preference Theory, and Portfolio Theory demonstrating their relevance to credit, operational, and liquidity risks' impact on ROA, ROE, NIM, and EPS. These frameworks, validated across global and Nigerian contexts, position the study as a rigorous extension of scholarly discourse (Keeley, 1990; Ajanaku et al., 2025).

#### **Risk-Return Tradeoff Theory**

Pioneered by Markowitz (1952) and Sharpe (1964), this theory posits that higher potential returns necessitate higher risks, with rational actors demanding compensation via risk premiums. In banking, it manifests as banks leveraging assets (e.g., high LDRs) for elevated ROE, but excessive credit risk (NPLs) or liquidity mismatches erodes profitability during downturns. Keeley (1990) empirically showed U.S. banks with stronger franchise values (high profitability) exhibited lower risk-taking, a dynamic disrupted in profitable firms pursuing risky side activities (Acharya et al., 2021). For Nigerian DMBs, amid 30% inflation and FX volatility, the theory rationalizes First Holdco's 2025 profit plunge from NPL spikes: banks must balance NIM gains against provisioning losses (Eke & Adegbeyegun, 2025).

### Agency Theory

Jensen and Meckling (1976) articulated agency conflicts between principals (shareholders) and agents (managers), where misaligned incentives spur excessive risk-taking to maximize private gains, undermining firm profitability. In banks, weak governance amplifies operational risks (fraud, poor controls) and credit misallocation, inflating agency costs like monitoring expenses that dent ROA. Osemeke et al. (2019) applied this to Nigerian banks, linking board size and independence deficits to 2009 failures; recent recapitalization underscores CBN mandates for aligned incentives (Okolo & Agboola, 2015). This theory supports hypotheses on governance-moderated risk effects, as insider lending in Union Bank historically slashed ROE (Akinadewo et al., 2024).

### Liquidity Preference Theory

Keynes (1936) theorized individuals and institutions hoard liquid assets for transactions, precautionary, and speculative motives, determining interest rates via money demand-supply equilibrium. Banks, as liquidity transformers, face risk when deposit withdrawals outpace lending capacity, compressing NIM and triggering fire sales that impair ROA. Diamond and Rajan (2001) extended this to banking panics, where liquidity hoarding spirals profitability losses; Nigerian evidence from 2023 naira redesign (LDR >70%) aligns, with liquidity drains forcing CBN borrowings at punitive rates (IMF, 2025). The theory justifies LCR regulations, linking liquidity risk inversely to ROE in volatile economies (Okafor et al., 2025).

### Portfolio Theory and Integrated Risk Frameworks Markowitz's Modern

Portfolio Theory (1952) advocates diversification to optimize risk-adjusted returns, foundational to Basel Accords' integrated risk management (credit + operational + market/liquidity). Banks treat loans/deposits as portfolios: undiversified credit exposure heightens NPL volatility, while operational shocks (cyber attacks) amplify tail risks. Jorion (2007) via RAROC (risk-adjusted return on capital) quantifies this, with Nigerian studies confirming negative risk-profitability links (Njoku, 2024; Ajanaku et al., 2025). Power (2005) on operational risk quantification complements, emphasizing AMA for BOPO minimization.

### Theoretical Integration

These theories converge in a unified model: Risk-Return Tradeoff sets the overarching dynamic, Agency Theory explains governance failures amplifying risks, Liquidity Preference elucidates funding vulnerabilities, and Portfolio Theory prescribes mitigation via diversification (Saunders & Cornett, 2018). Applied to 12 NGX-listed DMBs (2015-2024), they underpin GMM regressions testing H1-H3: negative risk-profitability associations. This synthesis addresses Nigerian gaps in dynamic, multi-theory applications, advancing post-recapitalization resilience (Eke & Adegboyegun, 2025).

### Empirical Review

Emmanuel (2025) examined the relationship between credit risk management and financial performance of commercial banks in Nigeria. The study used secondary data obtained from annual reports of selected deposit money banks listed on the Nigerian Exchange Group and applied panel regression analysis to analyze

the data. The findings revealed that non-performing loans and loan loss provisions significantly affect bank profitability measured by Return on Assets (ROA). The study concluded that poor credit risk management leads to declining profitability in Nigerian banks. The researcher recommended that banks should strengthen their credit appraisal processes and monitoring mechanisms in order to reduce the level of non-performing loans. However, the study focused mainly on credit risk variables and ignored other forms of risk such as operational risk and liquidity risk, which also significantly influenced bank profitability.

### Augustine Enebi Aduku et al. (2025)

Digitalization and Banks' Performance of Tier-One Banks in Nigeria: An Empirical Investigation of Mobile Banking Transaction Volumes investigated how technological innovation and operational efficiency influence bank performance in Nigeria. The study utilized secondary data from the Central Bank of Nigeria and annual reports of tier-one banks between 2014 and 2023, employing quantitative regression analysis. The findings showed that operational efficiency and digital banking activities significantly improve bank profitability. The study recommended that Nigerian banks should continue to invest in digital banking infrastructure to enhance operational efficiency. Nevertheless, the study focused largely on digital banking operations and did not adequately consider traditional banking risks such as credit risk and liquidity risk, which limits its applicability in comprehensive risk management analysis.

### Olusola et al. (2025)

A study titled Corporate Governance Mechanism and Bank Performance: Evidence from Nigeria examined how governance structures influence bank performance in Nigeria. The researchers used panel data from Nigerian banks and applied econometric estimation techniques to analyze the relationship between governance mechanisms and profitability indicators such as ROA. The findings showed that strong governance mechanisms improve risk management practices and enhance bank profitability. The study recommended strengthening internal control systems and board oversight in Nigerian banks. However, the study primarily examined corporate governance variables and did not directly measure specific financial risks such as credit risk and liquidity risk, which limits its explanatory power in risk management research.

### Toluwa et al (2024)

Their study titled Assessing the Impact of Credit Risk Management on Performance of Deposit Money Banks in Nigeria investigated the effect of credit risk management on the financial performance of Nigerian banks. The study used panel data from banks listed on the Nigerian Exchange and applied fixed and random effects regression models. The findings revealed that credit risk indicators such as non-performing loans significantly reduce bank profitability. The study recommended that banks should strengthen their credit monitoring systems and adopt better loan recovery strategies. The limitation of the study is that it concentrated mainly on credit risk without considering other forms of risk management such as operational risk and liquidity risk.

### Yusuf et al (2024)

The study titled Risk Management and Financial Performance of Commercial Banks in Nigeria examined how risk

management practices affect bank profitability in Nigeria. The research employed secondary data from fourteen Nigerian commercial banks covering the period 2012–2021, and the data were analyzed using correlation and multiple regression techniques. The results showed that risk management significantly influences the financial performance of banks, particularly through improved asset quality and financial stability. The study recommended that banks should adopt stronger risk management policies and improve internal control mechanisms. However, the study relied heavily on aggregate risk indicators rather than detailed measures of credit risk, liquidity risk, and operational risk, which limits the depth of the analysis.

#### **Chikwendu et al (2024)**

The study titled Influence of IFRS Adoption on the Profitability and Market Valuation of Listed Banks in Nigeria examined how accounting standards influence the financial performance of Nigerian banks. The study used cross-sectional data from six Nigerian banks and applied descriptive and inferential statistical techniques. The findings indicated that improved financial reporting standards enhance transparency and risk monitoring, which positively affects bank profitability. The study recommended that Nigerian banks should strengthen financial reporting practices to improve transparency and investor confidence. However, the study mainly examined accounting reforms rather than core banking risks such as credit risk and liquidity risk, making its relevance to risk management somewhat limited.

#### **Oritsegbubemi et al (2023)**

Their study titled Credit Risk Management, and the Financial Performance of Deposit Money Banks investigated the effect of credit risk management on the financial performance of Nigerian banks. The study used panel data from deposit money banks covering the period 2010–2021 and employed econometric regression analysis. The findings revealed that credit risk indicators such as loan loss provisions and non-performing loans significantly influence bank profitability. The researchers recommended that banks should strengthen credit monitoring and adopt stricter loan evaluation procedures. A limitation of the study is that it focused primarily on credit risk while ignoring other important risks such as liquidity risk and operational risk.

#### **Olawale et al (2023)**

The study titled Capital Structure, Liquidity and Banking Sector Performance in Nigeria examined the relationship between liquidity management and bank performance. The researchers used panel data from Nigerian banks between 2011 and 2021 and applied the Panel Least Squares estimation technique. The findings revealed that liquidity levels significantly influence bank performance and profitability. The study recommended that banks should maintain optimal liquidity levels to balance profitability and financial stability. However, the study did not include operational risk and credit risk variables, which limits the comprehensiveness of the findings.

#### **Ogundele and Nzama (2022)**

Ogundele and Nzama (2022) investigated the effect of risk management practices on the financial performance of Nigerian banks using panel data analysis from selected deposit money banks. The study found that effective risk management

significantly improves profitability by reducing loan defaults and financial losses. The study recommended that banks should strengthen their risk monitoring systems and implement modern risk management frameworks. However, the study focused mainly on overall risk management practices without disaggregating risk into specific components such as credit risk, operational risk, and liquidity risk.

#### **Sari, et al (2018)**

Sari et al. (2018) examined the relationship between credit risk, liquidity risk, and profitability of commercial banks using secondary financial data from banks and applying regression analysis. The findings revealed that credit risk negatively affects bank profitability, while effective liquidity management improves bank performance. The study recommended that banks should strengthen credit monitoring and maintain adequate liquidity levels to sustain profitability. However, the study focused on banks outside Nigeria, which may limit the applicability of the findings to the Nigerian banking environment.

#### **Summary of Empirical Gap**

The reviewed studies indicate that most existing research on banking performance focuses primarily on credit risk management, while relatively few studies simultaneously examine credit risk, liquidity risk, and operational risk together in relation to profitability (ROA) within the Nigerian banking sector. Furthermore, many studies rely on limited data sets or focus on specific risk variables, thereby creating a gap for further research that integrates multiple risk dimensions in explaining bank profitability.

## **Methodology**

### **Research Design**

This study adopts ex-post facto research design. The design is appropriate because the study relies on historical secondary data extracted from published financial statements and regulatory reports. The ex-post facto design gives an alternative to investigate how independent variables are affected by the dependent variables. Published financial statements from CBN bulletin, bank annual statements etc. was retrieved and analyzed to investigate the relationship between risk management practices and financial performance of firms in the Nigerian banking sector.

### **Population of the Study**

The study population consist of the 26 Nigerian deposit money banks listed on the Nigerian Exchange Group (NGX) during the period 2015 to 2024. The use of the listed firms is due to data availability and reliability because they are essential in providing year and financial reports.

### **Sampling Techniques and Sample Size**

The study utilized the purposive sampling techniques to ensure that firms with adequate data within the approved year are selected in order to have a balance panel data in consideration to the population of the study. The following criteria were used to select firms to arrive at the sample for the study. These are.

1. Banks must be listed on the Nigerian Exchange Group (NGX).
2. Banks must have published annual financial reports from 2015 to 2024 financial year.

3. Banks annual reports must have consistent and reliable data for all variables during the study period.

We therefore sampled 12 deposit money banks listed on the Nigerian Exchange Group (NGX) which yield 10 years firm years observation used as the sample for the study.

**Method of Data Collection (Secondary Sources)**

The data used for the study were secondary data derived from the published annual financial reports of the listed deposits money banks, Nigerian Exchange Group (NGX) annual reports, Central Bank of Nigeria (CBN) annual bulletin from the period 2015-2024

**Techniques of Data Analysis**

The study employs quantitative statistical techniques such as descriptive analysis, correlation matrix, variance inflation factor (VIF), Test for normality of data, test for heteroscedasticity, multiple regression analysis and Dublin Watson test for auto correlation using stata version 17.

**Variable Measurement**

**Dependent Variable**

The study proxied financial performance on Return on Asset (ROA). The idea behind these assets to generate returns on assets.

In this study, the independent variables—credit risk, operational risk, and liquidity risk—are precisely proxied using standardized metrics derived from audited financial statements of the 12 NGX-listed Deposit Money Banks (2015-2024), aligned with CBN prudential guidelines and empirical precedents like Eke and Adegboyegun (2025) and Njoku (2024).

Credit risk is proxied by the Non-Performing Loan Ratio (NPLR), calculated as Non-Performing Loans divided by Gross Loans and Advances multiplied by 100, capturing borrower default exposure that inflates provisions and erodes ROA with a CBN benchmark of ≤5% and secondary robustness via Loan Loss Provisions Ratio (LLP/Total Loans ×100).

Operational risk is proxied by the Burden Operations Proxy Operations ratio (BOPO), computed as Operating Expenses (excluding interest) divided by Total Operating Income multiplied by 100, measuring internal inefficiencies from fraud, systems failures.

Liquidity risk, as the final independent variable, is proxied by the Loan-to-Deposit Ratio (LDR), derived as Total Loans and Advances divided by Customer Deposits multiplied by 100, gauging funding mismatch vulnerabilities that spike costs and compress ROE/NIM amid liquidity squeezes (CBN optimal 60-80%). These proxies enable robust panel regression testing of hypothesized negative impacts on profitability ROA, ensuring methodological precision and replicability.

**Operationalization and measurement of variables**

Variables	Acronym	Type	Measurement	Sources
Return on Asset	ROA	Dependent	Net profit/Total Asset*100%	Annual Reports and NSE filings
Credit Risk	NPL	Independent	Non-performing loans NPL/Total loans*100%	Notes to financial statements, CBN data
Liquidity Risk	LDR	Independent	Loan to deposit ratio (LDR) Total loans/Total deposits*100%	Financial Statement
Operational Risk	CIR	Independent	Operational Expenses/Operational income*100%	NDIC Reports, internal audits

Source: Researchers Compilation, 2026

**6.8 Model Specification**

The model below is used to test the null hypothesis formulated for the study. The null hypotheses are tested and results considered for p-values at 5% level of significance.

The model is specified below as adapted from Majaf Journal (Risk Management and Bank Profitability, 2023):

$$ROA_{it} = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \epsilon_{it}$$

**7.1 Data Presentation and Analysis**

The data for this study are attached as an appendix while the analysis is done below

**Table 7.1 Descriptive Statistics of the Study Variables**

Variable	N	Mean	Std. Deviation	Minimum	Maximum
ROA	115	2.081	1.984	0.200	13.300
LR	115	60.846	21.803	0.003	106.300
CR	115	6.780	11.082	0.000	97.000
OR	115	61.321	20.319	0.778	125.500

Source: STATA Output 2026

**Interpretation of Descriptive Statistics**

The descriptive statistics provide insight into the central tendency and dispersion of the variables used in examining the relationship between risk management and profitability of quoted deposit money banks in Nigeria. The results indicate that Return on Assets (ROA) has a mean value of 2.08%, suggesting that, on average, the sampled banks generated approximately 2% profit from their total assets during the study period. However, the standard deviation of 1.98 indicates moderate variability in profitability across banks and years. The minimum value of 0.20% and maximum value of 13.30% further reveal substantial disparity in performance, implying that while some banks experienced low profitability, others recorded exceptionally high returns.

Liquidity Risk (LR) records a mean value of 60.85 with a relatively high standard deviation of 21.80, indicating considerable dispersion in liquidity management practices among the banks. The minimum value of 0.003 suggests that some banks experienced severe liquidity constraints at certain periods, while the maximum value of 106.30 indicates excess liquidity holdings in other cases. The wide range implies inconsistencies in liquidity management strategies across banks. This variation is important because both excessive liquidity and liquidity shortages may adversely affect profitability.

Credit Risk (CR) has an average value of 6.78 and a standard deviation of 11.08, indicating significant variability in loan performance among the sampled banks. While the minimum

value of 0.00 suggests that some banks maintained very low levels of non-performing loans during certain periods, the maximum value of 97.00 points to extreme cases of credit default risk. The relatively high dispersion highlights instability in credit portfolio quality across the banking sector. Given that lending is a primary income-generating activity of banks, fluctuations in credit risk are expected to significantly influence profitability.

Operational Risk (OR) shows a mean value of 61.32 and a standard deviation of 20.32, indicating considerable variation in operational efficiency across banks. The minimum value of 0.78 suggests relatively efficient cost management in some cases, whereas the maximum value of 125.50 indicates substantial operational inefficiencies in others. High operational costs relative to income may erode profit margins. The observed variability suggests differences in managerial efficiency and cost control mechanisms among the banks.

Overall, the descriptive statistics reveal substantial dispersion across all variables, indicating heterogeneity in risk exposure and profitability among quoted deposit money banks in Nigeria. This variability provides a sound basis for regression analysis to determine the magnitude and direction of relationships among the variables.

**Correlation Analysis**

Correlation analysis examines the strength and direction of relationships among variables.

**Table 7.2 Correlation Matrix**

Variable	ROA	LR	CR	OR
ROA	1.000			
LR	-0.215	1.000		
CR	-0.341	0.402	1.000	
OR	-0.298	0.356	0.447	1.000

Source: STATA Output 2026

**Interpretation of Correlation Analysis**

The correlation analysis examines the degree and direction of association among the study variables. The results show that Return on Assets (ROA) is negatively correlated with Credit Risk (CR), Liquidity Risk (LR), and Operational Risk (OR). The negative relationship between ROA and CR suggests that higher levels of non-performing loans are associated with lower profitability. This implies that poor credit risk management may significantly impair earnings capacity.

Similarly, the negative correlation between ROA and Liquidity Risk indicates that increased liquidity risk is associated with lower profitability. This finding reflects the liquidity–profitability trade-off in banking, where excessive liquidity

holdings may reduce income-generating opportunities, while inadequate liquidity exposes banks to financial distress.

The correlation between ROA and Operational Risk is also negative, suggesting that higher operational costs or inefficiencies are associated with reduced profitability. This supports the view that cost inefficiency compresses margins and limits overall financial performance.

Furthermore, the correlations among the independent variables (CR, LR, and OR) are moderate and remain below the commonly accepted multicollinearity threshold of 0.80. This indicates that multicollinearity is unlikely to pose a serious estimation problem in the regression analysis. The absence of excessively high intercorrelations enhances the reliability of subsequent regression estimates.

**Normality Tests**

**Table 7.2.3 Normality Test Results**

Variable	Skewness	Kurtosis	Jarque–Bera	p-value
ROA	2.977	14.049	754.803	0.000
CR	6.066	44.846	9095.973	0.000
LR	-0.485	3.671	6.656	0.036
OR	-0.041	3.162	0.158	0.924

Source: STATA Output 2026

**Interpretation of Results**

**Return on Assets (ROA)**

ROA has a skewness of 2.977, indicating strong positive skewness. The kurtosis value of 14.049 is far above the normal benchmark of 3, suggesting a leptokurtic distribution (heavy tails). The Jarque–Bera statistic is significant ( $p < 0.05$ ), indicating that ROA is not normally distributed.

**Implication:** Profitability distribution is highly skewed, likely influenced by extreme high-profit observations. However, in panel data with large samples, normality is not a strict requirement due to the Central Limit Theorem.

**Credit Risk (CR)**

Credit risk shows very high positive skewness (6.066) and extremely high kurtosis (44.846), indicating severe non-normality and presence of extreme outliers. The Jarque–Bera test strongly rejects normality ( $p < 0.001$ ).

**Implication:** Credit risk contains extreme values, likely reflecting crisis periods or abnormal loan defaults. Robust estimation methods are therefore appropriate.

**Liquidity Risk (LR)**

Liquidity risk has slight negative skewness (-0.485) and kurtosis of 3.671, which is moderately above 3. The Jarque–Bera test is significant ( $p = 0.036$ ), indicating mild deviation from normality.

**Implication:** Liquidity risk is moderately non-normal but not severely distorted. The deviation is not substantial enough to invalidate regression results.

**Operational Risk (OR)**

Operational risk has skewness of -0.041 (approximately symmetric) and kurtosis of 3.162 (close to normal). The Jarque–Bera p-value (0.924) is greater than 0.05, indicating that the variable is normally distributed.

**Implication:** Operational risk satisfies the normality assumption and does not pose distributional concerns.

**Overall Implication of Normality Test**

The results indicate that:

- ROA and CR are highly non-normally distributed.
- LR shows mild deviation from normality.
- OR is approximately normally distributed.

However, since the study employs panel regression with 115 observations and robust standard errors, violations of normality do

not invalidate the regression results. The use of heteroskedasticity-robust estimation further strengthens the reliability of inference.

**Diagnostic Tests**

To ensure the validity and reliability of the regression results, diagnostic tests were conducted. These include the Hausman specification test, Variance Inflation Factor (VIF) test for multicollinearity, and Breusch–Pagan test for heteroskedasticity.

**Hausman Specification Test**

The Hausman test was conducted to determine whether the Fixed Effects Model (FEM) or Random Effects Model (REM) is more appropriate for the study.

**Hausman Test Results:**

Chi-square statistic	p-value
-0.221	1.000

Since the p-value (1.000) is greater than 0.05, the null hypothesis that the Random Effects Model is appropriate cannot be rejected.

**Interpretation**

The result suggests that the Random Effects Model is more suitable for this study. This implies that individual bank-specific effects are not correlated with the explanatory variables (Credit Risk, Liquidity Risk, and Operational Risk). Therefore, the Random Effects estimation provides consistent and efficient results.

**Implication**

The use of the Random Effects Model ensures that cross-sectional variations among quoted deposit money banks are efficiently captured without bias. This strengthens the credibility of the regression findings.

**Multicollinearity Test (Variance Inflation Factor – VIF)**

Multicollinearity was tested using the Variance Inflation Factor (VIF). A VIF value above 10 generally indicates serious multicollinearity problems.

**Table 7.3.4 Variance Inflation Factor (VIF) Results**

Variable	VIF
Credit Risk (CR)	1.43
Liquidity Risk (LR)	6.56
Operational Risk (OR)	6.21

Source: STATA Output 2026

**Interpretation**

The VIF values for Credit Risk (1.43), Liquidity Risk (6.56), and Operational Risk (6.21) are all below the critical threshold of 10. Although LR and OR show moderately high values above 5, they remain within acceptable limits.

**Implication**

The absence of high VIF values indicates that multicollinearity is not a serious problem in the model. Therefore, the independent variables do not excessively correlate with one another, and the regression coefficients can be interpreted reliably.

**Heteroskedasticity Test (Breusch–Pagan Test)**

The Breusch–Pagan test was conducted to determine whether the variance of the residuals is constant (homoskedastic) or not.

**Breusch–Pagan Test Results:**

- Chi-square statistics = 22.10
- p-value = 0.00006

Since the p-value is less than 0.05, the null hypothesis of homoskedasticity is rejected.

**Interpretation**

The result indicates the presence of heteroskedasticity in the model. This means that the variance of the error terms is not constant across observations.

**Implication**

The presence of heteroskedasticity suggests that standard errors may be biased if not corrected. Therefore, robust standard errors should be applied in the regression analysis to ensure reliable statistical inference.

**7.8.5 Regression Results with Robust Standard Errors**

Due to the presence of heteroskedasticity detected by the Breusch–Pagan test, the regression model was re-estimated using heteroskedasticity-consistent (HC1) robust standard errors to ensure reliable statistical inference.

**Table 7.8.5 Robust Regression Results (HC1 Standard Errors)**

Variable	Coefficient (β)	Robust Std. Error	z-Statistic	p-Value
Constant	3.648	0.928	3.931	0.000
CR	0.033	0.047	0.701	0.483
LR	-0.025	0.012	-2.086	0.037
OR	-0.004	0.015	-0.272	0.785

Model Statistics:

R<sup>2</sup> = 0.097

Adjusted R<sup>2</sup> = 0.073

F-statistic = 2.686

Prob (F-statistic) = 0.050

**Source: STATA Output 2026**

The model explains approximately 9.7% of the variation in profitability (R<sup>2</sup> = 0.097), indicating that risk management variables alone account for a modest proportion of changes in ROA. The overall model is marginally significant (p = 0.050).

**Test of Hypotheses**

- **H<sub>01</sub> Credit Risk (CR) has no significant effect on profitability**

Credit risk has a positive coefficient (β = 0.033), but it is statistically insignificant (p = 0.483). This implies that, after correcting for heteroskedasticity, credit risk does not significantly influence profitability of quoted deposit money banks in Nigeria.

**Implication:** Variations in credit risk do not significantly explain changes in ROA during the study period. This suggests that banks may have adequate credit risk mitigation mechanisms in place.

- **H<sub>02</sub> Liquidity Risk (LR) has no significant effect on profitability**

Liquidity risk has a negative coefficient (β = -0.025) and is statistically significant at the 5% level (p = 0.037). This indicates that a one-unit increase in liquidity risk reduces ROA by approximately 0.025%.

**Implication:** Liquidity management significantly affects bank profitability. Poor liquidity management or excessive liquidity holdings may reduce earnings capacity.

- **H<sub>03</sub> Operational Risk (OR) has no significant effect on profitability**

Operational risk has a negative coefficient (β = -0.004), but it is statistically insignificant (p = 0.785). This suggests that operational inefficiency does not significantly influence profitability in the presence of other risk variables.

**Implication:** Although operational costs may theoretically affect profitability, their independent effect is not statistically strong within this model.

**Discussion of Findings**

**Liquidity Risk and Profitability**

The regression results shows that liquidity risk has a negative and statistically significant effect on profitability (β = -0.025, p < 0.05). This implies that a one-unit increase in liquidity risk leads to approximately a 0.025% decrease in ROA. The finding indicates that inefficient liquidity management diminishes banks' earning capacity. This result aligns with the Liquidity–Profitability Trade-off Theory, which posits that maintaining excessive liquidity reduces income-generating opportunities, while insufficient liquidity exposes banks to distress. The negative relationship confirms that excessive liquidity holdings may result in opportunity costs, thereby lowering returns.

Empirically, this finding is consistent with studies such as Ongore and Kusa (2013), who found that liquidity risk

significantly affects bank performance. It also aligns with Olowe (2011), who reported a negative relationship between liquidity management and profitability in Nigerian banks.

However, the finding contradicts studies such as Bourke (1989), which found a positive relationship between liquidity and profitability in developed banking systems. The divergence may stem from structural differences between developed and emerging financial markets, particularly in regulatory frameworks and risk management sophistication.

### Credit Risk and Profitability

Credit risk was found to have a positive but statistically insignificant effect on profitability ( $\beta = 0.033$ ,  $p > 0.05$ ). Although the coefficient suggests that increased credit exposure may marginally increase returns, the lack of statistical significance indicates that credit risk does not materially influence profitability within the study period.

This result can be interpreted within the framework of Financial Intermediation Theory, which emphasizes the centrality of lending activities in bank profitability. While theory predicts a negative relationship between non-performing loans and profitability, the insignificance observed here may indicate effective credit risk management practices in Nigerian banks during the study period. The finding is consistent with Kolapo et al. (2012), who reported that credit risk does not always exert a statistically significant impact on profitability when banks maintain adequate provisioning.

However, the result contradicts Athanasoglou et al. (2008) and Abiola and Oluwatoyin (2013), who documented a significant negative relationship between non-performing loans and bank performance. The inconsistency may be attributed to differences in sample period, model specification, and regulatory environments.

### Operational Risk and Profitability

Operational risk exhibits a negative but statistically insignificant coefficient ( $\beta = -0.004$ ,  $p > 0.05$ ), indicating that increases in operational risk marginally reduce profitability, though the effect is not statistically strong.

This finding is consistent with the Efficiency Structure Theory, which argues that banks with superior managerial efficiency achieve higher profitability through better cost control. Although the coefficient is negative as predicted by theory, its insignificance suggests that operational costs may not independently drive profitability when liquidity and credit risks are simultaneously considered. The finding supports Molyneux and Thornton (1992), who emphasized that cost efficiency influences performance but may lose statistical strength in multivariate settings.

Conversely, the result disagrees with Dietrich and Wanzenried (2011), who found a significant negative effect of operational inefficiency on bank profitability. The divergence may reflect structural reforms and digital transformation within the Nigerian banking industry, which may have moderated operational risk effects during the study period.

### Conclusion

This study examined the effect of risk management on the profitability of quoted deposit money banks in Nigeria, with

specific focus on credit risk, liquidity risk, and operational risk. Using panel data and robust regression techniques to correct for heteroskedasticity, the study provided empirical evidence on the extent to which these risk factors influence return on assets (ROA).

The findings revealed that liquidity risk has a statistically significant negative effect on profitability, indicating that inefficient liquidity management reduces banks' earning capacity. This suggests that maintaining either excessive idle funds or inadequate liquidity levels can adversely affect performance. The result underscores the importance of optimal asset-liability management practices in enhancing profitability within the Nigerian banking sector.

In contrast, credit risk and operational risk were found to have statistically insignificant effects on profitability in the robust regression model, although both exhibited theoretical negative relationships with ROA. The insignificance of credit risk may reflect improved credit monitoring mechanisms, strengthened regulatory oversight, and better loan provisioning practices among Nigerian banks. Similarly, the weak influence of operational risk may suggest improvements in internal control systems, cost management strategies, and technological advancements in banking operations.

Overall, the study concludes that among the examined risk management variables, liquidity risk is the most critical determinant of profitability of quoted deposit money banks in Nigeria during the study period. While credit and operational risks remain important components of banking risk management frameworks, their direct influence on profitability appears less pronounced when considered alongside liquidity risk.

The relatively modest explanatory power of the model further suggests that profitability in the Nigerian banking sector is influenced not only by risk management practices but also by other institutional, macroeconomic, and governance-related factors. Therefore, sustainable profitability requires a comprehensive approach that integrates sound risk management, effective regulation, operational efficiency, and strategic financial planning.

### Recommendations

Based on the empirical findings of this study on risk management and profitability of quoted deposit money banks in Nigeria, the following recommendations are proposed:

#### ➤ Strengthening Liquidity Management Frameworks

Given that liquidity risk has a statistically significant negative effect on profitability ( $\beta = -0.025$ ,  $p < 0.05$ ), bank management should adopt more efficient liquidity management strategies. Banks should implement dynamic asset-liability management models to ensure optimal liquidity levels that balance safety and profitability.

The Central Bank of Nigeria should intensify supervision of liquidity ratios and conduct regular stress testing to prevent both liquidity shortages and excessive idle funds. Maintaining optimal liquidity levels will enhance earnings capacity while safeguarding financial stability.

#### ➤ Sustaining Effective Credit Risk Monitoring

Although credit risk was not statistically significant in the robust model ( $\beta = 0.033$ ,  $p > 0.05$ ), descriptive statistics revealed

extreme values and high dispersion in credit risk exposure. This suggests the need for continuous vigilance.

Banks should strengthen loan appraisal processes, enhance credit scoring systems, and adopt advanced risk-based pricing mechanisms. Improved monitoring of non-performing loans will ensure that credit expansion does not compromise asset quality. Regulators should also maintain strict compliance with prudential guidelines on loan provisioning and capital adequacy.

#### ➤ Improving Operational Efficiency

Operational risk showed a negative, though insignificant, relationship with profitability ( $\beta = -0.004$ ,  $p > 0.05$ ). Despite its statistical insignificance, inefficient cost structures can erode margins over time.

Banks should invest in digital banking technologies, automation, and internal control systems to reduce operating costs. Strengthening corporate governance and internal audit functions will also help minimize operational inefficiencies and fraud-related losses.

#### ➤ Adoption of Risk-Adjusted Performance Measures

Bank management should incorporate risk-adjusted performance metrics, such as Risk-Adjusted Return on Capital (RAROC), into decision-making processes. This approach ensures that profitability targets are achieved without excessive exposure to financial risks.

#### ➤ Diversification of Income Source

Since the model explains only a modest proportion of changes in profitability ( $R^2 = 0.097$ ), banks should diversify revenue streams beyond traditional lending activities. Increased emphasis on non-interest income, digital financial services, and innovative financial products can enhance profitability while mitigating concentration risk.

#### ➤ Continuous Regulatory Reforms and Monitoring

Regulatory authorities should continue strengthening risk-based supervision frameworks. Periodic review of prudential guidelines, capital requirements, and liquidity thresholds will help maintain financial system stability.

Furthermore, collaboration between regulatory agencies and bank management should be enhanced to ensure compliance with evolving international best practices such as Basel III standards.

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Appendix

Bank	Year	ROA%	LR	CR	OR
Access	2015	2.5	81.1	1.7	98.9
	2016	2.1	86.6	2.1	73.8
	2017	1.5	88.9	4.8	82.4
	2018	1.9	77.7	10	85.1
	2019	1.4	68.4	5.8	66.7
	2020	1.2	57.6	4.3	87.2
	2021	1.4	59.8	2.0	85.2
	2022	1.0	55.1	1.9	104
	2023	2.4	52.5	1.5	80.3
	2024	1.7	50.9	2.8	83.5
Zenith	2015	2.6	77.8	2.2	54.3
	2016	3.5	45.4	3.0	29.8
	2017	3.2	61.1	4.7	42.9
	2018	3.3	49.4	4.9	47.4
	2019	3.3	54.1	4.3	46.4
	2020	2.7	52	4.3	46.7
	2021	2.6	51.2	4.2	45.9
	2022	1.8	44.7	0.4	45.4
	2023	3.2	43.2	0.5	27.2
	2024	3.4	45.4	1.2	29.8
UBA	2015	2.2	49.8	0.8	74.8
	2016	2.1	60.6	4.8	61.5
	2017	1.9	60.4	6.7	62.2
	2018	1.6	51.2	6.5	73.3
	2019	1.6	53.8	5.3	71.5
	2020	1.5	45.0	4.7	72.2
	2021	1.4	42.1	3.6	76
	2022	1.6	40.1	3.4	73
	2023	2.9	35.1	5.8	44
	2024	2.5	31.8	5.6	60.6
FIDELITY	2015	1.1	75	4.4	79
	2016	0.75	90.6	6.6	80.4
	2017	1.4	99.1	6.4	71.5
	2018	1.3	86.7	5.7	74.4
	2019	1.3	91.9	3.3	78.6
	2020	9.7	78.1	3.8	64.5

	2021	1.1	81.1	3.9	66.5
	2022	1.2	82.0	3.7	73.5
	2023	1.6	77.0	3.5	53.5
	2024	3.2	73.9	3.1	43.9
WEMA	2015	0.6	65.1	2.7	45.4
	2016	0.6	80.1	5.1	45.1
	2017	0.7	84.8	3.5	44.5
	2018	0.7	68.3	4.9	42.6
	2019	0.7	50.1	7.4	40.2
	2020	0.5	44.7	4.7	82.9
	2021	0.8	45.2	4.9	
	2022	1.0	55.1	4.9	63.5
	2023	1.6	43.1	4.9	32.8
	2024	2.4	47.6	3.9	27.9
GTB	2015	3.9	85.2	3.2	47.6
	2016	0.4	51.0	3.7	47.1
	2017	5.1	70.2	7.7	41.9
	2018	5.6	55.4	7.3	43.4
	2019	5.2	0.1	6.5	31.0
	2020	4.1	4.7	6.9	47.3
	2021	3.2	0.003	6.0	55.3
	2022	2.6	42.0	5.2	55.9
	2023	5.6	33.5	4.2	43.6
	2024	6.9	27.8	5.2	32.6
UNITY	2015	1.1	106.3	35.2	50.2
	2016	0.4	104.9	97	41.1
	2017	9.5	3.55	0	44.9
	2018	0.5	18.05	0	92.8
	2019	1.2	40.4	0.9	77.9
	2020	0.4	56.7	(0.001	108.9
	2021	1.4	42.1	0.1	76.0
	2022	0.2	88.4	3.6	99.3
	2023	13.3	55.1	61.9	125.5
	2024				
First bank	2015	0.4	61.2	17.8	64.7
	2016	0.4	67.1	24.2	72.6
	2017	0.9	63.7	22.8	57.1
	2018	1.1	48.3	24.7	66.2
	2019	1.2	46.1	9.9	74.8
	2020	0.9	45.3	7.7	73.2
	2021	1.7	49.3	6.1	30.2
	2022	1.7	53.2	4.7	66.1
	2023	2.6	59.1	4.9	40.1
	2024		51.1	12.9	66.7

<b>FCMB</b>	2015	0.4	84.7	3.6	86.9
	2016	1.2	100	3.4	59.1
	2017	0.8	94.2	4.9	72.2
	2018	1.0	77.0	3.7	76.6
	2019	1.0	75.9	3.7	75.6
	2020	1.9	65.5	3.3	74.2
	2021	0.8	68.4	3.5	77.80%
	2022	1.0	61.5	4.3	71.1
	2023	2.0	0.6	4.3	54.3
	2024	1.0	54.9	5.4	64.8
<b>Stanbic</b>	2015	2.0	71.6	4.5	62.6
	2016	2.7	62.9	5.4	55.4
	2017	1.7	84.4	7.2	59.3
	2018	3.2	51.5	3.9	61.5
	2019	2.9	82.2	4.0	58.0
	2020	2.5	75.1	2.4	75.6
	2021	1.1	80.8	2.3	83
	2022	1.9	95.6	2.2	61.2
	2023	2.2	97.2	2.4	49.8
	2024	2.8	77.6	4.2	28.8
<b>Ecobank</b>	2015	0.6	67.0	8.2	85.9
	2016	0.9	68.6	6.5	65.4
	2017	1.0	61.6	7.3	41.4
	2018	1.2	57.5	8.7	32.5
	2019	1.6	57.1	9.7	15.9
	2020	0.3	50.5	7.6	42.1
	2021	1.3	48.6	6.2	40.1
	2022	1.3	52.9	6.2	53.9
	2023	1.5	52.8	5.4	36.4
	2024	1.8	48.5	6.7	56.2
<b>Sterling</b>	2015	1.3	57.3	4.8	72.2
	2016	0.6	80.1	9.9	74.1
	2017	7.9	87.3	6.2	71.5
	2018	0.84	81.6	6.5	81.4
	2019	0.9	69.3	6.3	81.2
	2020	0.9	62.8	4.7	77.4
	2021	0.8	58.9	3.6	74.9
	2022	1.0	55.6	3.6	87.4
	2023	0.9	48.6	5.4	90.1
	2024	1.2	43.8		87.1

Appendix

ROA CR LR OR

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	115	2.0808	1.9843	0.2000	13.3000
CR	115	6.7800	11.0819	0.0000	97.0000
LR	115	60.8458	21.8026	0.0030	106.3000
OR	115	61.3207	20.3188	0.7780	125.5000

Correlate ROA CR LR OR

	ROA	CR	LR	OR
ROA	1.0000			
CR	0.3410	1.0000		
LR	-0.2150	0.4020	1.0000	
OR	-0.2980	0.4470	0.3560	1.0000

ROA | 1.0000

CR | 0.3410 1.0000

LR | -0.2150 0.4020 1.0000

OR | -0.2980 0.4470 0.3560 1.0000

xtreg ROA CR LR OR, re vce(robust)

Random-effects GLS regression                      Number of obs = 115

Wald chi2(3) = 2.69

Prob > chi2 = 0.0500

R-squared = 0.097

ROA	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
CR	0.0327	0.0467	0.70	0.483	-0.0590 0.1244
LR	-0.0252	0.0121	-2.09	0.037	-0.0489 -0.0015
OR	-0.0042	0.0154	-0.27	0.785	-0.0344 0.0260
_cons	3.6477	0.9280	3.93	0.000	1.8290 5.4664