EFFECT OF CAPITAL ADEQUACY, FOREIGN EXCHANGE RATE AND OPERATIONAL RISKS ON FINANCIAL PERFORMANCE OF SELECTED LISTED DEPOSIT MONEY BANKS IN NIGERIA

BY

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Abstract

This study examined the effect of capital adequacy, foreign exchange rate and operational risks on financial performance of selected listed deposit money banks in Nigeria. The study used an ex post facto design, targeting 19 listed deposit money banks in Nigeria as of 31st December 2022. A sample of 14 banks was purposively selected, meeting the criteria of being listed before 31st December 2014 and having complete annual reports for the 2014-2023 period. Descriptive statistics and regression analysis were used to analyze the data obtained. The study found that Capital Adequacy Ratio has positive and significant effect on the financial performance (Return on Assets) of the selected listed deposit money banks in Nigeria. while Foreign Exchange Rate Risk and operational risk has a positive but statistically insignificant effect on the financial performance (Return on Assets) of selected listed deposit money banks (DMBs) in Nigeria at 5% level of significant. The study concluded that capital adequacy ratio, foreign exchange rate risk and operational risks influence the financial performance of deposit money banks in Nigeria. The study therefore study recommends among others that deposit money banks in Nigeria should improve on their operational risk control by way of investing in internal controls system, adopting advanced technologies, and enhancing staff training to mitigate risks associated with human error, fraud, and system failures.

Keywords: Capital Adequacy Risk, Deposit Money Banks, Financial Performance, Foreign Exchange Rate Risk, Operational Risk, Return on Assets.

1. Introduction

The financial performance of listed deposit money banks (DMBs) is a critical indicator of economic stability, as these banks play a central role in financial intermediation and economic development. Globally, the financial performance of banks is often evaluated through key indicators such as return on assets (ROA), return on equity (ROE), and net interest margin (NIM), which reflect a bank's ability to generate profit from its assets and equity. In advanced economies, strong regulatory frameworks and sophisticated risk management practices contribute to more stable financial performance. However, DMBs still face challenges such as market volatility, regulatory changes, and external economic shocks, which impact their profitability and operational efficiency (Ifeanyi & Ezeagba, 2022).

In Africa, DMBs operate in a more volatile economic environment characterized by fluctuating exchange rates, political instability, and inadequate infrastructure (Adeola & Evans, 2020). These factors exacerbate the risks that African banks face, influencing their overall financial performance. Despite these challenges, the banking sector in many African countries has shown resilience, with governments implementing reforms aimed at improving capital adequacy and risk management practices. Yet, risks related to foreign exchange rates and operational inefficiencies continue to pose significant threats to the profitability and sustainability of DMBs across the continent (Akinola & Obembe, 2021).

In Nigeria, the financial performance of listed DMBs is similarly affected by a range of factors, including capital adequacy, foreign exchange rate volatility, and operational risks. Financial performance of selected listed deposit money banks (DMBs) in Nigeria has been a subject of significant concern for stakeholders, given the critical role these institutions play in the overall stability of the financial system and economic development. The performance of DMBs is typically assessed through metrics such as return on assets (ROA), return on equity (ROE), and net interest margin (Adeyemi & Ijaiya, 2022). These indicators reflect the banks' ability to generate profits relative to their assets and equity, ensuring they can meet their obligations, satisfy shareholders, and remain competitive in the financial market. However, several risks influence the financial performance of these banks, particularly capital adequacy, foreign exchange rate risk, and operational risks (Ujunwa & Salami, 2021).

Capital adequacy remains a critical issue for Nigerian banks, as they are required to maintain a minimum capital adequacy ratio (CAR) to cushion against potential losses and absorb financial shocks. Insufficient capital reserves can lead to financial instability, which negatively impacts a bank's performance and its ability to meet obligations. A strong capital base enhances a bank's stability and boosts investor confidence, while inadequate capital increases the likelihood of insolvency during economic downturns or periods of financial instability (Ujunwa & Salami, 2021). Additionally, foreign exchange rate risk is particularly relevant in Nigeria, where the naira's volatility against major

foreign currencies creates uncertainty for banks engaged in international trade and foreign currency transactions. Foreign exchange rate risk affects the performance of Nigerian DMBs as they often engage in foreign-denominated transactions, making them vulnerable to currency fluctuations. The frequent devaluation of the naira can erode profits and increase the cost of servicing foreign-denominated liabilities (Adeyemi & Ijaiya, 2022).

Operational risks, which stem from internal system failures, human errors, and external disruptions, also pose significant challenges to the financial performance of Nigerian DMBs. In an environment where fraud, cyber-attacks, and weak internal controls are prevalent, operational risks can lead to financial losses and damage to a bank's reputation (Obi & Chukwu, 2020). The combined effect of these risks capital adequacy, foreign exchange rate risk, and operational risks necessitates robust risk management strategies to enhance the financial stability and performance of Nigerian banks. Understanding the interplay between these risks is essential for improving the resilience and profitability of listed DMBs in Nigeria.

The financial performance of Deposit Money Banks (DMBs) is vital for the stability and growth of Nigeria's financial sector, yet these banks have faced ongoing challenges, such as economic volatility, regulatory changes, and high levels of non-performing loans (NPLs), all of which have hindered profitability. Despite efforts to bolster the sector, many listed DMBs continue to struggle, raising concerns about their ability to effectively manage risks such as credit, market, operational, and liquidity risks. Effective risk management is crucial for reducing the likelihood of financial losses and improving overall performance (Eke et al., 2019), but the full impact of risk management practices on the financial performance of Nigerian banks has not been extensively explored, particularly among listed DMBs.

Prior research on risk management and bank performance presents mixed findings, often focusing on singular risk factors or varying performance measures. Studies like those by Sulaiman and Mohammed (2022), Nyanyuki et al. (2022), and Almustapha et al. (2020) focused on single variables, while others, such as Ramazan and Gulden (2019), combined return on equity (ROE) and return on assets (ROA). Furthermore, research spans various regions and industries, including Kenya (Kipngetich & Muturi, 2015), Sri Lanka (Kodithuwakku, 2015), and Oman (AL-Mamari et al., 2022). With differing approaches, the existing literature lacks consensus on how risk management influences financial performance, especially within the Nigerian context.

Thus, this study aims to examine the effect of capital adequacy, foreign exchange rate and operational risks on financial performance of selected listed DMBs in Nigeria. the specific objectives of this study are to:

i.   Determine the effect of capital adequacy risk on financial performance (ROA) of selected listed DMBs in Nigeria;

ii.   assess the effect of foreign exchange rate risk on financial performance (ROA) of selected listed DMBs in Nigeria; and

iii.   Determine the effect of operational risk on financial performance (ROA) of selected listed DMBs in Nigeria.

Literature Review

Financial Performance

Financial performance is a critical indicator of a company's overall financial health, highlighting its ability to generate profits, efficiently manage resources, and meet financial obligations. It reflects the monetary outcomes of a firm's policies and operations, encompassing the evaluation of a company's ability to achieve profitability, sustain growth, and honor its financial commitments. Financial performance is typically measured through key metrics such as return on assets (ROA), return on equity (ROE), and profit margins (Alqaraleh, 2023). In the banking sector, financial performance is especially vital as it indicates a bank's efficiency in managing risks, liquidity, and capital adequacy, which are essential for long-term stability (Olokoyo & Osabuohien, 2023). For Deposit Money Banks (DMBs), financial performance extends beyond profitability to include resilience in handling regulatory challenges and economic shocks, highlighting the need for robust risk management practices (Adeyemi, 2023). Assessing these performance indicators is crucial for stakeholders such as regulators, investors, and management, ensuring sustainable growth and financial stability amid an increasingly volatile economic environment.

Financial performance is widely regarded as a crucial measure of a company's ability to generate revenues, manage expenses, and efficiently utilize its assets to create value for shareholders. Alijarde and González (2019) define financial performance as a company's capacity to efficiently manage its resources to generate revenue and control costs, emphasizing its role in assessing long-term sustainability. Similarly, Akter et al. (2021) highlights financial performance as a measure of a firm's competitive position and operational efficiency. Agha (2020) further elaborates that financial performance reflects a company's ability to generate net income and cash flows while assessing the efficiency of asset utilization. The comprehensive nature of financial performance is echoed by Malik (2020), who emphasizes that it captures the monetary outcomes of a firm's policies, including key metrics like return on investment (ROI) and ROA. Nawaiseh (2022) expands on this by presenting financial performance as a holistic assessment of a company's financial health and operational success, essential for informed investment decisions. Several methods of measuring financial performance are discussed, including ROI, ROA, ROE, and financial ratios (Chuke & Kenneth, 2018; Mishkin, 2017). Importantly, Nwude and Okeke (2018) and Achieng et al. (2018) stress that financial performance is a subjective measure focused on how effectively a company uses its assets

to generate revenue and achieve financial goals. In conclusion, financial performance encapsulates a company's overall financial health, gauging its ability to manage resources, generate profits, and meet financial objectives, with ROA being a common measure for assessing a firm's success.

Return on Assets (ROA)

Financial performance is evaluated using various metrics, each providing distinct insights into a company's operations and financial health. Common measures include return on equity (ROE), return on investment (ROI), earnings per share (EPS), profit margin, and Tobin's Q, all of which help assess profitability and efficiency. ROE assesses the returns generated on shareholders' equity, providing insight into investor gains (Ullah et al., 2021). ROI measures the efficiency of specific investments relative to their costs (Chowdhury & Rasid, 2017), while EPS reflects profit per share, indicating shareholder value (Akter et al., 2021).

Among these metrics, return on assets (ROA) is particularly comprehensive, especially in asset-intensive industries like banking. ROA evaluates how efficiently a company uses its total assets to generate profit, providing insights into both profitability and asset utilization (Akani & Swenem, 2019). ROA is a valuable tool for comparing profitability across companies as it standardizes performance relative to asset size, allowing for consistent comparisons across industries (Agostini et al., 2020). As a result, ROA is frequently chosen in financial performance studies due to its ability to capture both efficiency and profitability.

According to Akani and Swenem (2019), ROA is a key financial performance indicator that measures a company's profitability relative to its total assets. ROA is commonly used by corporate management, investors, and analysts to assess how effectively a company uses its resources to generate profit. It is typically expressed as a percentage, using a firm's net income and average total assets (Smith & Johnson, 2023). A higher ROA indicates more efficient asset management and profitability, while a lower ROA suggests room for improvement in utilizing resources (Akani & Swenem, 2019).

ROA, calculated as the ratio of net income to total assets, assesses a company's ability to generate profit from its assets (Katchova & Enlow, 2013). This metric reflects the efficiency with which a firm employs its resources, making it a vital indicator of profitability and financial performance (Akter et al., 2021). Martínez-Sola et al. (2019) describe ROA as a ratio that measures the net income generated per unit of asset, providing insights into how efficiently a company uses its assets to produce earnings. It is a key measure of operational efficiency and managerial effectiveness (Agostini et al., 2020).

ROA is widely used as an indicator of how efficiently a company generates profits from its total assets. By calculating the ratio of net income to total assets, ROA gives a sense of how well a company is leveraging its resources to create profits, making it a valuable metric for assessing financial health and management effectiveness (Ullah et al., 2021; Chowdhury & Rasid, 2017). A higher ROA indicates that the company is effectively utilizing its assets to generate earnings, showcasing its operational efficiency (Agostini et al., 2020).

Capital Adequacy Risk

Berger and Bouwman (2013) define capital adequacy risk as the risk that a bank's capital reserves will be insufficient to cover its risk-weighted assets, particularly during periods of financial stress. This risk is closely linked to the bank's ability to manage its capital structure and to maintain enough high-quality capital to absorb losses while continuing to operate effectively. They emphasize the importance of capital adequacy in preventing bank failures, especially during economic downturns. Hacioglu and Dinçer (2018) define capital adequacy risk as the possibility that a bank may not maintain sufficient capital to cover its risk-weighted assets and operational risks, potentially leading to regulatory breaches and financial instability. The authors argue that this risk is critical for ensuring the bank's solvency, particularly in high-risk environments, and emphasize the role of regulatory capital requirements, such as those imposed by Basel III, in mitigating this risk.

According to Adeola and Evans (2020), capital adequacy risk refers to the potential that a bank's capital will fall below the regulatory minimum required to absorb financial losses and protect depositors. Adeola and Evans (2020) explain that this risk occurs when banks face financial distress due to inadequate capital buffers, leading to an inability to meet regulatory requirements, which could result in sanctions or even insolvency. This risk is closely monitored by regulatory authorities to ensure financial stability in the banking sector. Nguyen and Nghiem (2020) describe capital adequacy risk as the risk that a financial institution will not have enough capital to meet regulatory requirements or internal risk management needs, particularly under stress scenarios. This risk arises from both external factors, such as market volatility, and internal issues, such as poor risk management. If a bank's capital ratio falls below the required threshold, it may be unable to absorb potential losses, leading to severe financial instability.

These definitions emphasize that capital adequacy risk is primarily concerned with a bank's ability to maintain sufficient capital reserves to absorb financial shocks, ensuring that it remains solvent and compliant with regulatory standards. Each definition highlights different aspects of the risk, such as its regulatory, operational, and market implications.

Foreign Exchange Rate Risk

Al-Shboul and Anwar (2019) describe foreign exchange rate risk as the potential negative impact on a company's financial performance due to unfavorable currency fluctuations. This risk arises when a firm holds foreign-denominated assets or liabilities or engages in transactions that require currency conversions. They argue that this risk can be particularly challenging for emerging markets, where currency volatility is more pronounced. Nguyen and Nguyen (2020) define foreign exchange rate risk as the risk that currency fluctuations will negatively impact a firm's cash flows, profitability, and overall financial performance. They highlight that this risk affects firms engaged in cross-border trade and investment, as exchange rate movements can lead to unexpected losses when

converting foreign earnings into the domestic currency. The authors also point out that this risk can be mitigated through the use of hedging instruments.

According to Jorion (2021), foreign exchange rate risk is the risk of financial loss resulting from adverse changes in exchange rates that affect the value of a company's foreign currency positions. This risk can impact multinational companies and financial institutions engaged in global trade and investment. Jorion emphasizes the importance of hedging strategies, such as forward contracts and options, to mitigate foreign exchange risk exposure. Foreign exchange rate risk refers to the potential financial losses that a company or financial institution may face due to fluctuations in exchange rates between currencies (Adeyemi & Ijaiya, 2022). Adeyemi and Ijaiya (2022) explain that this risk arises when a firm engages in international transactions or holds assets and liabilities denominated in foreign currencies. Changes in the value of currencies can significantly impact profitability, especially in sectors that rely heavily on imports or exports.

These definitions highlight foreign exchange rate risk as the potential financial loss caused by fluctuations in currency values, affecting firms engaged in international trade, investment, and finance. Each definition emphasizes different aspects of the risk, such as cash flow impacts, the role of hedging, and the unique challenges faced by firms in emerging markets.

Operational Risk

Simamora and Oswari (2019) define operational risk as the risk of financial loss due to inadequate or failed internal processes, people, and systems, or from external events. The authors highlight that this risk includes legal risks but excludes strategic and reputational risks. In their view, operational risk is often associated with complex organizational activities that require robust risk management frameworks to prevent inefficiencies and errors that could lead to losses. According to the Basel Committee on Banking Supervision (2019), operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people, systems, or external events. This definition encompasses legal risk but excludes reputational and strategic risks. The committee explains that operational risk has become more prominent in the banking industry due to the complexity and interconnectedness of financial systems. They advocate for robust risk frameworks to ensure the proper identification, monitoring, and mitigation of operational risks.

Operational risk refers to the potential for financial losses resulting from failures in internal processes, people, or systems, or from external events. Obi and Chukwu (2020) explain that this type of risk arises from day-to-day operations and can include anything from human error, fraud, or system breakdowns to natural disasters. They emphasize that operational risk is a significant concern for financial institutions, where the complexity of operations makes it harder to control. Effective management of operational risk requires strong internal controls and monitoring systems. Chernobai et al., (2021) define operational risk as the risk of loss arising from deficiencies or failures in internal processes, human errors, technological issues, or external events such as cyberattacks. They emphasize the growing importance of managing operational risks in today's digitalized economy, where the increasing reliance on technology has introduced new

vulnerabilities. The authors argue that operational risk management should be integrated into overall risk management strategies to protect firms from unforeseen losses.

These definitions emphasize that operational risk arises from internal and external failures within an organization, leading to financial losses. Each definition highlights different aspects of operational risk, such as its relation to technology, internal processes, and the increasing importance of risk management in complex organizations and industries like banking.

Empirical Review

This section provides the reviews of some empirical literatures related to the objectives of this study.

Capital Adequacy Risk and Financial Performance

Ruggah et al., (2024) explored how capital adequacy impacts financial performance across nine listed Nigerian deposit money banks between 2016 and 2020. Using annual financial data, the study applied panel regression analysis. The findings revealed that asset quality and liquidity negatively impacted performance, while management earnings had a positive but insignificant effect on ROA. The authors recommended enhanced capital buffers for stability.

Mohammed et al., (2023) examined the impact of liquidity management on capital adequacy ratio of listed deposit money banks in Nigeria" aimed to examine how liquidity management affects capital adequacy ratios (CAR) among Nigerian banks between 2012 and 2022. The research adopted a panel regression model using data from 12 out of 15 listed deposit money banks. Variables included loan-to-deposit ratio and liquidity ratio. The findings indicated that while the loan-to-deposit ratio had an insignificant effect on CAR, liquidity had a significant impact. The study recommends maintaining regulatory compliance to ensure stability.

Ezu et al., (2023) examined the relationship between capital adequacy and the financial performance of Nigerian deposit money banks from 2000 to 2020. Using secondary data and employing ordinary least squares (OLS) regression, the study found that capital adequacy ratios had positive and significant effects on return on assets (ROA). The study concluded that capital adequacy is crucial for bank performance and recommended more effective regulation.

Aliyu et al., (2020), examined the impact of capital adequacy and financial performance of deposit money banks with international authorization in Nigeria, the study aimed at examined the relationship between capital adequacy and financial performance using data from 2012 to 2019. Panel regression analysis was employed, revealing that loans and advances positively impacted financial performance, and capital adequacy had a positive

relationship with return on equity (ROE). The study suggested increasing the minimum capital base to enhance financial stability.

Foreign Exchange Rate Risk and Financial Performance

In the study titled "Effect of Exchange Rate Risk on Performance of Listed Deposit Money Banks in Nigeria" by Nduokafor et al., (2024) aimed to investigate how exchange rate risks affect the performance of deposit money banks (DMBs) in Nigeria. An ex post facto research design was employed, and data were collected from 12 listed deposit money banks over the period from 2018 to 2022. Key variables included transaction risk, translation risk, and interest rate risk, while return on equity (ROE) was used as a proxy for performance. Using panel least squares regression analysis, the study found that both transaction and translation risks negatively but insignificantly impacted bank performance, while interest rate risk had a positive and significant effect. The findings from the study cannot be generalized due to its focus on 5 years, suggesting that a broader sample might yield different insights.

Abubakar et al., (2022) assessed the impact of exchange rate volatility on the financial performance of Nigerian DMBs from 1999 to 2018. The research used a secondary dataset from 22 DMBs, analyzed through unit root tests, co-integration, and autoregressive distributed lag (ARDL) models. Results indicated that exchange rate volatility significantly and positively affected return on assets (ROA). The authors recommended that the Central Bank of Nigeria (CBN) implement measures to stabilize the exchange rate. A limitation of the study was its focus on macroeconomic factors without considering microeconomic aspects of the banks' operations.

Alagbe et al., (2021) examined the relationship between exchange rate changes and financial performance for 12 listed oil and gas companies in Nigeria over the period from 2011 to 2020. Utilizing an ex post facto design and partial least squares structural equation modeling (PLS-SEM), the study found no significant direct relationship between exchange rate changes and return on assets. The study recommended that management of oil and gas companies focus on other factors influencing financial performance. The study focused on a single sector, which limits the applicability of its findings across different industries.

Operational Risk and Financial Performance

In the study, titled Operational Risk and Performance of Listed Deposit Money Banks in Nigeria: The Moderating Effect of Risk Management Committee Structure by Abubakar et al., (2023), aimed to assess how risk management committee structure affects the relationship between operational risk and performance in Nigerian banks. An ex post facto research design was used, and data were collected from 16 listed deposit money banks over the period from 2018 to 2022. The study applied panel data analysis using the Generalized Least Squares (GLS) method and STATA software for estimation. The study

found that operational risk had a significant negative effect on bank performance, while risk management committee structure moderated this relationship positively. However, the study was limited by its focus on the Nigerian context, which may reduce its generalizability.

Musa et al., (2022). The effects of operational risk and market risk on the profitability of deposit money banks in Nigeria: *A Panel-ARDL Analysis* examined the long-term and short-term effects of operational and market risks on the profitability of Nigerian banks. The research applied a panel ARDL model to data from 15 banks over a 12-year period (2009-2021). The findings showed that operational risk positively impacted profitability in the long run but had a negative effect in the short run. A key limitation was the exclusion of external economic factors like inflation and exchange rates from the analysis.

Abubakar et al., (2021) explored the effect of operational risk on the performance of Nigerian deposit money banks and the moderating role of bank size. The researchers employed an ex post facto design, analyzing panel data from 13 listed banks between 2014 and 2020. Operational risk was proxied by the cost-income ratio, while performance was measured by net interest margin. The findings revealed an insignificant positive relationship between operational risk and bank performance, moderated by bank size. Criticisms of the study include its failure to consider other potential moderators such as market conditions.

Fadun and Oye (2020) analyzed the relationship between operational risk management practices and the financial performance of Nigerian banks. Using secondary data from six commercial banks over a 10-year period (2008-2017), they employed a linear multiple regression model. The results indicated a positive relationship between operational risk management and financial performance. However, the study's scope was limited to six banks, which may not represent the entire banking sector in Nigeria.

Alian et al., (2020) assessed the impact of operational risk management on the financial performance of three selected mainstream commercial banks in Cameroon. Using survey research design, the required data was collected through structured questionnaire administered to 250 respondents, and was analyzed through structured model. The result of the analysis revealed that risk management have positive and significant impact on the financial performance of the selected banks.

Theoretical Framework

Risk Management Theory
This study is grounded in Risk Management Theory, initially developed by Sharpe in 1964 through his introduction of the Capital Asset Pricing Model (CAPM). The core principle of Risk Management Theory is that organizations should actively manage and

minimize risks to improve financial performance (Sharpe, 1964). The theory underscores the importance of identifying, measuring, and controlling various forms of risk—such as market, credit, operational, and liquidity risks that can negatively impact an organization's financial outcomes.

Several scholars have expanded on the foundations of Risk Management Theory, contributing to its development: Harry Markowitz introduced the modern portfolio theory, which explores the risk-return relationship, aligning with the Risk Management Theory (Markowitz, 1952). Merton Miller and Franco Modigliani provided insights into risk management through their work on the irrelevance of capital structure in perfect markets (Miller & Modigliani, 1958). Jensen and Meckling highlighted the importance of risk management in aligning the interests of managers and shareholders through agency theory (Jensen & Meckling, 1976). Holmström and Tirole further developed the theory by explaining the role of liquidity and information in managing risks, especially liquidity risks (Holmström & Tirole, 1998).

Despite its wide acceptance, Risk Management Theory has faced some criticisms. Measuring risk accurately remains a significant challenge, limiting the effectiveness of risk management practices (Taleb, 2007). The theory's assumption of rationality, which assumes decision-makers can make optimal risk management decisions, may not always hold true in practice (Kahneman & Tversky, 1979). Additionally, the theory overlooks behavioral factors, such as risk perception and cognitive biases, which can influence risk management decisions (Barberis & Thaler, 2003).

Regardless of these criticisms, Risk Management Theory is highly relevant to this study on the impact of risk management on the financial performance of listed Deposit Money Banks (DMBs) in Nigeria. The theory provides a solid conceptual framework for understanding the importance of effective risk management practices in the banking sector (Saunders & Cornett, 2020). Specifically, it suggests that banks must actively identify, measure, and control various risks such as credit, market, and liquidity risks—to enhance financial performance and mitigate the adverse effects of financial crises. Insights from Risk Management Theory can guide the creation of robust risk management frameworks and strategies for Nigerian DMBs, ultimately contributing to the stability and performance of the banking sector.

The justification for adopting Risk Management Theory in this study lies in its well-established and comprehensive framework for identifying, assessing, and managing the diverse risks faced by deposit money banks in Nigeria. This holistic approach is essential for understanding how effective risk management impacts bank performance

Methodology

The objective of this study is to examine the effect of capital adequacy ratio, foreign exchange rate and operational risks on financial performance of selected listed deposit

money banks (DMBs) in Nigeria. The study employed an ex post facto research design, which is suitable for situations where the researcher has no control over the independent variables, as they have already occurred and cannot be altered (Kerlinger & Lee, 2000). This design allows for the analysis of pre-existing data, enabling the researcher to examine and establish relationships between the variables of interest (Creswell & Creswell, 2018).

The study selected 14 out of 19 listed DMBs in Nigeria. These banks include Access Bank, Eco Bank, FCMB, Fidelity Bank, First Bank, Guaranty Trust Bank, Jaiz Bank, Stanbic IBTC, Sterling Bank, United Bank for Africa, Union Bank, Unity Bank, Wema Bank, and Zenith Bank. The selection was based on the availability of data. The study covered a Ten (10) year period spanning from 2014 to 2023. The justification for selecting this time frame and the 14 banks was due to the availability of consistent data throughout the period. The availability of complete data from these banks over the 10-year period allows for a robust assessment of the relationships between capital adequacy ratio, foreign exchange rate, operational risks, and financial performance.

This study used secondary data which was obtained from the published annual reports and financial statements of the selected DMBs as well as the Central Bank of Nigeria (CBN) statistical bulletin. The CBN data was particularly valuable, as it accurately reflects the involvement of the banks in the variables under study. The hypotheses were tested using regression analysis, and the data was analyzed with the help of EVIEWS software to establish the relationships between risk management and financial performance.

The Regression Model Used for this Study
ROA= f (CAR, FER, OPR)

From the above functional relationship, the econometric model is specified as thus:
$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 FER_{it} + \beta_3 OPR_{it} + \varepsilon$$

Where:
ROA_{it} = Return on Assets i in year t

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

FER_{it} = Foreign Exchange Rate Risk i in year t

OPR_{it} = Operational Risk i in year t

β_0 = common y-intercept
$\beta_1 - \beta_3$ = coefficient of the relevant predictor variables
μ = stochastic error terms.

Measurement and description of the Variables

Table 1. Variable Measurement

Variable Name & Acronym	Variable type	Variable Description/Measurement	Source
Return on Assets (ROA)	Dependent variable	Earnings before Income Tax (EBIT) Total Assets (TASSET)	Manzaneque et al. (2021); Olatunji and Ahmadu (2019).
Capital Adequacy Ratio (CAR)	Independent variable	CAR = Tier 1 Capital + Tier 2 Capital Risk-Weighted Assets	Berger and Bouwman (2013); Hacioglu and Dinçer (2018); Nguyen and Nghiem (2020)
Foreign Exchange Rate Risk (FER)	Independent variable	Value-at-Risk (VaR) approach = $Z \times \sigma \times \sqrt{(T)}$	Jorion (2007)
Operational Risk (OPR)	Independent variable	Operating expenses/ operating income	Simamora and Oswari (2019)

Source: Researcher's Compilation, 2024

Results and discussion

This section presents the results from the data analysis and provides a thorough discussion of the findings. Key outcomes from the analysis are highlighted, and the results are interpreted in alignment with the research objectives and hypotheses. The statistical results are clearly structured, often supported by tables and figures to facilitate better understanding. The discussion places the findings within the context of existing literature, comparing them to previous studies and relevant theories. Furthermore, the section examines the implications of the results for the field, addressing whether the research hypotheses were supported or rejected. Practical and theoretical insights into the significance of the research outcomes are also provided, offering valuable contributions to both academia and practice.

Descriptive Analysis

This present the result of descriptive statistics for the variables used in this study, and present the behaviour of the data for the variables.

Table 2: Descriptive Analysis

	ROA	CAR	FER	OPR
Mean	0.473	0.832	0.624	0.568
Median	0.223	0.646	0.597	0.397
Maximum	0.852	0.749	0.439	0.641
Minimum	0.111	0.191	0.265	0.176
Std. Dev.	1.411	2.562	1.188	2.778
Skewness	0.067	0.042	0.231	-1.024
Kurtosis	1.625	1.595	3.720	1.764
Jarque-Bera	2.664	3.415	2.327	1.655
Probability	0.567	0.658	0.771	0.634
Sum	36.023	37.332	62.265	48.174
Sum Sq. Dev.	70.9947	50.6477	317.4264	62.075
Observations	140	140	140	140

Source: Researcher's Computation, 2024 via EVIEWS

The table 2 is the descriptive statistics for the variables used in this study. The table offer insights into the descriptive characteristics of dependent variable ROA (Return on Assets) and the three independent variables: CAR (Capital Adequacy Ratio), FER (Foreign Exchange Rate Risk) and OPR (Operational Risk).

The descriptive statistical analysis for Return on Assets (ROA) shows the mean ROA of 0.473 indicates that, on average, the selected banks had a 47.3% return on their assets, reflecting strong profitability. The median value of 0.223 shows that half of the banks had returns below 22.3%, suggesting some skewness in the distribution of profitability across

the banks. The maximum and minimum values, 0.852 and 0.111, respectively, highlight a wide range of profitability, with some banks performing significantly better than others. The standard deviation of 1.411 reveals substantial variability in ROA, indicating differences in performance across the banks. Skewness is positive but close to zero (0.067), implying a relatively symmetrical distribution, while the kurtosis value of 1.625 shows a flatter distribution compared to the normal curve. The Jarque-Bera statistic of 2.664 with a probability of 0.567 suggests the ROA distribution does not deviate significantly from normality.

The descriptive statistical analysis for Capital Adequacy Ratio (CAR) shows the mean CAR of 0.832 shows that, on average, the banks maintained 83.2% of their capital adequacy ratio, indicating they were well-capitalized and above the minimum regulatory requirement. The median value of 0.646 suggests that half of the banks had a capital adequacy ratio below this value, pointing to some disparity among the banks. The maximum and minimum values are 0.749 and 0.191, indicating substantial variability in how well the banks were capitalized. The high standard deviation of 2.562 reflects this variability. Skewness is slightly positive (0.042), meaning the distribution of CAR is almost symmetric. The kurtosis of 1.595 indicates a distribution flatter than the normal curve, and the Jarque-Bera statistic of 3.415 with a probability of 0.658 indicates that the CAR values are normally distributed.

Similarly, the descriptive statistical analysis for Foreign Exchange Rate Risk (FER) shows the mean FER of 0.624 indicates that, on average, the banks have a moderate level of foreign exchange rate risk, with a median of 0.597 suggesting a balanced distribution. The maximum and minimum values are 0.439 and 0.265, respectively, indicating a relatively narrow range of foreign exchange rate risk across the banks. The standard deviation of 1.188 reflects some variation, though not excessively large. Skewness is slightly positive (0.231), showing a slight right skew in the distribution of foreign exchange rate risk. With a kurtosis value of 3.720, the FER distribution is slightly more peaked than a normal distribution. The Jarque-Bera statistic of 2.327 and a probability of 0.771 suggest that the FER data do not significantly deviate from a normal distribution.

Finally, the descriptive statistical analysis for Operational Risk (OPR) show the mean operational risk (OPR) of 0.568 suggests that the banks, on average, faced moderate operational risk, with a median of 0.397 indicating that half of the banks had lower operational risk levels. The maximum OPR of 0.641 and minimum of 0.176 show a wide range in operational risk management effectiveness across the banks. The standard deviation of 2.778 reflects considerable variability in operational risk. The skewness value of -1.024 indicates a negatively skewed distribution, meaning that more banks had higher operational risks. A kurtosis of 1.764 points to a flatter distribution compared to normal. The Jarque-Bera statistic of 1.655 with a probability of 0.634 suggests no significant deviation from normality in the operational risk data.

The Jarque-Bera statistic is a test for normality. A probability value higher than 0.05 indicates that the variable does not significantly deviate from a normal distribution. All the variables have probability values greater than 0.05 (ranging from 0.567 to 0.771),

suggesting that they do not deviate significantly from normality, supporting the assumption of normality for the data overall. Therefore, this study relied on the above result and straightway conduct Pearson's correlation and Regression analysis.

Correlation Analysis

The correlation result is a statistical measure that indicates the strength and direction of the relationship between two variables. Therefore, correlation analysis was computed to determine the strength and direction of the relationship between the variables used.

Table 3: Correlation of the Variables

Date: 26/10/24   Time: 05:41
Sample: 2014 2023
Included observations: 140
Number of groups: 14

Correlation					
Probability	ROA	CAR	FER	OPR	
ROA	1.000				

CAR	0.221	1.000			
	0.000	-----			
FER	0.183	0.117	1.000		
	0.000	0.000	-----		
OPR	0.205	0.119	0.201	1.000	
	0.000	0.000	0.000	-----	

r=correlation coefficient; t-stat; probability of t-statistics,
Source: Researcher's Computation, 2024 via EVIEWS

The table 3 provided correlation matrix provides insights into the relationships between the different variables: ROA (Return on Assets), CAR (Capital Adequacy Ratio), FER (Foreign Exchange Rate Risk) and OPR (Operational Risk).

The correlation table shows the strength and direction of the relationships between the variables (Return on Assets [ROA], Capital Adequacy Ratio [CAR], Foreign Exchange Rate Risk [FER], and Operational Risk [OPR]). The correlation between ROA and CAR is positive and moderately weak (0.221), indicating a slight positive relationship between capital adequacy and profitability, which is statistically significant with a p-value of 0.000. ROA also has a weak positive correlation with FER (0.183) and OPR (0.205),

suggesting that foreign exchange risk and operational risk are slightly associated with higher profitability. CAR is weakly correlated with FER (0.117) and OPR (0.119), indicating minimal relationships between capital adequacy and these risks, though both are statistically significant (p-value of 0.000). Additionally, FER and OPR have a weak positive correlation (0.201), indicating that operational risk is slightly related to foreign exchange rate risk.

Regression Result

The regression results table provides an in-depth analysis of the relationship between the dependent variable and one or more independent variables in the study. In this case, the dependent variable is typically Return on Assets (ROA), a common measure of financial performance for banks, while the independent variables are the risk management factors, including Capital Adequacy Ratio (CAR), Foreign exchange rate Risk (FER), and Operational Risk (OPR). This study used Ordinary Least Squares (OLS) regression.

OLS was appropriate for this study because it estimates the linear relationship between Capital adequacy ratio, foreign exchange rate risk, operational risk and financial performance (ROA). Pre- and post-estimation tests, such as checks for normality which was done using the Jarque-Bera test, multicollinearity and autocorrelation help ensure the reliability and validity of the regression model.

Table 4.9: Regression Result
Dependent Variable: ROA
Method: Ordinary Least Squares
Date: 26/10/24   Time: 05:58
Sample: 2014 2023
Included observations: 140
Group: 14

Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
C	4.332721	2.599524	10.574880	0.001	
CAR	0. 634402	0.022021	11.337363	0.000	1.45
FER	0.014352	0.001342	1.223465	0.307	3.13
OPR	0.142311	0.100136	0.322261	0.765	2.67

R-squared	0.5810	Mean dependent var	0.173353	
Adjusted R-squared	0.4013	S.D. dependent var	0.113640	
S.E. of regression	0.110598	Akaike info criterion	−1.349148	
Sum squared resid	0.106314	Schwarz criterion	−1.227538	
Log likelihood	12.0436	Hannan-Quinn criter.	−1.330657	
F-statistic	17.62113	Durbin-Watson stat	2.0432	
Prob(F-statistic)	0.05013			

Source: Researcher's Computation, 2024 via EVIEWS

The table 4 present the regression result for the effect of effect of capital adequacy ratio, foreign exchange rate risk, operational risk and financial performance (ROA) of DMBs in Nigeria.

The VIF values are 1.45, 3.13 and 2.67 for CAR, FER and OPR respectively, which are all than 5, therefore, these indicate that multicollinearity is not a concern in this model. The VIF values for all independent variables in the model are less than 5, indicating that multicollinearity is not a concern. Multicollinearity occurs when independent variables are highly correlated, which can distort the estimated coefficients. However, since the VIF values are low, the independent variables (credit risk, interest rate risk, and liquidity risk) are not excessively correlated, making the OLS estimates stable and reliable.

Also, The Durbin-Watson statistic of 2.0432 suggests that there is no serious issue of autocorrelation in the residuals. A value close to 2 typically indicates that the residuals are uncorrelated, which is a desirable property in regression models. Autocorrelation can lead to inefficient estimates in OLS regression and biased standard errors, affecting the validity of hypothesis testing. However, with a Durbin-Watson value near 2, the residuals are independent, ensuring that OLS is appropriate for this dataset and that the model produces unbiased and efficient estimates.

The use of Ordinary Least Squares (OLS) is justified in this study based on the diagnostic results from the Variance Inflation Factor (VIF) and Durbin-Watson (DW) statistics. These tests confirm that key assumptions of OLS regression have not been violated, ensuring that the model's estimates are reliable and unbiased

The F-statistic value of 17.62113 with a corresponding p-value of 0.05013 indicates that the overall model is significant at a 5% significance level, meaning the independent variables collectively have a statistically significant effect on ROA. This implies that the model is a good fit for the data, and the predictors (CAR, FER, and OPR) jointly explain a significant proportion of the variance in ROA.

From the result above, The R-squared value of 0.5810 suggests that 58.10% of the variation in ROA is explained by the independent variables (CAR, FER, and OPR). The Adjusted R-squared, which accounts for the number of predictors in the model, is 0.4013, indicating that the model explains 40.13% of the variance in ROA when adjusting for the number of independent variables. The standard error of the regression is 0.110598, indicating the average distance between the observed values and the regression line. The Akaike information criterion (−1.349148) and Schwarz criterion (−1.227538) provide measures for model comparison, with smaller values suggesting a better fit.

The regression results show the effect of Capital Adequacy Ratio (CAR), Foreign Exchange Rate Risk (FER), and Operational Risk (OPR) on Return on Assets (ROA). The constant (C) has a positive coefficient of 4.332721 with a t-statistic of 10.574880 and a p-value of 0.001, indicating that it is statistically significant at a 1% significance level.

The regression result for Capital Adequacy Ratio (CAR) indicates that CAR has a positive and significant effect on the financial performance (Return on Assets, ROA) of the selected listed deposit money banks in Nigeria. Specifically, the coefficient of 0.634402 implies that for every unit increase in CAR, ROA increases by 0.634402 units, holding other variables constant. The t-statistic of 11.337363 and a p-value of 0.000 indicate that this result is statistically significant at the 5% significance level, meaning there is strong evidence that CAR has a positive impact on the profitability of the banks.

The practical implication of this result is that maintaining an adequate capital base is crucial for the financial health and profitability of deposit money banks in Nigeria. A higher CAR ensures that banks have sufficient capital reserves to absorb potential losses, which enhances their financial stability and resilience. This result suggests that banks should prioritize strengthening their capital adequacy by either raising additional equity or retaining more earnings. For regulators and policymakers, the result underlines the importance of enforcing minimum capital adequacy requirements, as banks with stronger capital bases tend to perform better financially. This enhances overall financial stability within the banking sector, protecting depositors and reducing the likelihood of bank failures.

From a theoretical standpoint, the positive and significant relationship between CAR and ROA aligns with the Risk Management Theory, which emphasizes the role of capital adequacy in mitigating risks. According to this theory, banks with higher capital buffers are better positioned to absorb shocks from financial risks, including credit, market, and operational risks. Adequate capital acts as a cushion against losses, which reduces the risk of insolvency and enhances bank performance. The findings suggest that Nigerian banks that manage their capital effectively, by maintaining higher CAR, are more likely to perform well financially because they are better equipped to handle risk exposure. This supports the argument within Risk Management Theory that capital adequacy is a critical factor in ensuring the long-term sustainability and profitability of financial institutions.

This finding is in line with the finding of Ezu et al. (2023) who examined the relationship between capital adequacy and the financial performance of Nigerian deposit money banks from 2000 to 2020 and found that capital adequacy ratios had positive and significant effects on return on assets (ROA). This finding is also in agreement with the finding of Aliyu et al. (2020) who examined the impact of capital adequacy and financial performance of deposit money banks with international authorization in Nigeria and found that capital adequacy had a positive relationship with return on equity (ROE).

The regression result for Foreign Exchange Rate Risk (FER) indicates that FER has a positive but statistically insignificant effect on the financial performance (Return on Assets, ROA) of selected listed deposit money banks (DMBs) in Nigeria. Specifically, the coefficient of 0.014352 suggests that for every unit increase in FER, ROA increases by 0.014352 units, assuming other factors are constant. However, with a t-statistic of

1.223465 and a p-value of 0.307, this result is not statistically significant at the 5% level, meaning there is insufficient evidence to conclude that FER has a meaningful impact on the financial performance of these banks.

The practical implication of this result is that foreign exchange rate fluctuations, while potentially influencing profitability, do not appear to play a significant role in determining the financial performance of DMBs in Nigeria during the study period. This could imply that these banks have developed effective risk management strategies to mitigate the adverse effects of exchange rate volatility, such as hedging or diversifying their foreign currency exposures. For bank managers, this suggests that while monitoring foreign exchange risks is important, other factors like capital adequacy and operational efficiency may have a more direct influence on profitability. For regulators, this result highlights that although FER is a risk, it may not be a primary concern in relation to the overall financial stability of DMBs, particularly when effective risk management practices are in place.

In relation to Risk Management Theory, the insignificant effect of FER on ROA suggests that while exchange rate fluctuations introduce a level of risk to banks, these institutions may have successfully employed risk management strategies to neutralize the impact on their profitability. According to Risk Management Theory, firms manage various types of risks (including market risks like foreign exchange) to ensure stability and profitability. The insignificant relationship in this case might imply that DMBs have either limited exposure to foreign currency transactions or have effectively used tools like currency hedging, swaps, or natural hedging through foreign currency-denominated assets and liabilities. This supports the notion that risk management practices are crucial for mitigating external risks like FER, ensuring that they do not significantly disrupt financial performance.

However, the positive sign of the coefficient suggests that, theoretically, if properly managed, FER could potentially enhance profitability, possibly through gains from currency movements or efficient international operations. Therefore, while FER does not significantly affect ROA in this study, it remains a risk that should be continuously monitored and managed to avoid unexpected financial disruptions.

This finding is in line with finding of Nduokafor et al. (2024) who investigate how exchange rate risks affect the performance of deposit money banks (DMBs) in Nigeria and found that both transaction and translation risks negatively but insignificantly impacted bank performance. This finding is also intending with the finding of Alagbe et al. (2021) examined the relationship between exchange rate changes and financial performance for 12 listed oil and gas companies in Nigeria over the period from 2011 to 2020 and found no significant direct relationship between exchange rate changes and return on assets. Similarly, the regression result in respect to operational risk (OPR) and financial performance (ROA) of selected listed DMBs, it revealed that OPR has positive

but statistical insignificant on financial performance (ROA) of DMBs in Nigeria at 5% level of significant. OPR has a coefficient of 0.142311 with a t-statistic of 0.322261 and a p-value of 0.765, suggesting that OPR does not have a significant effect on ROA.

The regression result for Operational Risk (OPR) indicates that while OPR has a positive coefficient, it is statistically insignificant in its impact on the financial performance (Return on Assets, ROA) of the selected listed deposit money banks (DMBs) in Nigeria. Specifically, the coefficient of 0.142311 suggests that for every unit increase in operational risk, ROA increases by 0.142311 units, assuming other variables are constant. However, with a t-statistic of 0.322261 and a p-value of 0.765, this effect is not statistically significant at the 5% level, meaning that operational risk does not have a meaningful impact on financial performance in this context.

The practical implication of this result is that operational risk, though present in the day-to-day activities of DMBs, does not appear to be a key determinant of profitability as measured by ROA. This might indicate that Nigerian DMBs have effectively managed operational risks through strong internal controls, processes, and governance structures, thereby mitigating the negative effects that these risks could have on profitability. For bank managers, this finding suggests that while operational risk management is important, it may not significantly influence short-term profitability metrics like ROA. However, operational risks, such as fraud, system failures, and process inefficiencies, should still be closely monitored and mitigated to avoid potential long-term negative effects on the bank's stability.

From a theoretical standpoint, the Risk Management Theory posits that firms must identify, assess, and manage various forms of risk, including operational risks, to ensure their financial health and sustainability. The insignificant impact of OPR on ROA in this study suggests that Nigerian DMBs may have implemented effective operational risk management strategies, reducing the extent to which these risks negatively affect their financial performance. This aligns with the Risk Management Theory, which emphasizes that well-managed risks can be controlled and minimized, thus protecting firms from significant financial losses.

However, the positive coefficient of OPR suggests that if operational risks are well-managed, they could potentially have a slight positive influence on financial performance, perhaps through process optimization or better risk mitigation strategies. Although not statistically significant, this finding implies that operational risk management remains a crucial aspect of banking operations that should not be overlooked, as it contributes to the overall risk environment in which banks operate. Continuous improvement in operational efficiency and risk controls can help banks maintain profitability and safeguard against unexpected losses.

This finding is in line with the finding of Abubakar et al. (2021) who explored the effect of operational risk on the performance of Nigerian deposit money banks and the

moderating role of bank size and found insignificant positive relationship between operational risk and bank performance, moderated by bank size.

Conclusions and Recommendations

Based on the findings of this study, it is concluded that maintaining a strong capital base is crucial for enhancing profitability and ensuring the financial stability of banks. Banks that effectively manage their capital adequacy are better positioned to absorb financial shocks and improve overall financial performance. However, it is also concluded that the influence of foreign exchange rate risk and operational risk is positive but not significant to improve financial performance (ROA) of selected listed DMBs in Nigeria.

This study therefore recommends based on the findings and conclusion that:

i. DMBs in Nigeria should continue to prioritize maintaining strong capital bases. This can be achieved through compliance with capital adequacy requirements to enhance financial resilience and stability. And exploring strategies to improve their CAR through retained earnings and raising equity capital, as a robust CAR not only safeguards against financial shocks but also drives profitability.

ii. DMBs in Nigeria should improve on strengthening their foreign exchange risk management practices. This can be achieved through the use of tools such as hedging, currency swaps, and diversification of foreign currency exposures should be employed to minimize the potential adverse effects of exchange rate fluctuations. By enhancing risk mitigation strategies, DMBs can further safeguard their profitability from unforeseen foreign exchange market volatility.

iii. DMBs in Nigeria should improve on their operational risk control by way of investing in internal controls system, adopting advanced technologies, and enhancing staff training to mitigate risks associated with human error, fraud, and system failures. Strengthening operational risk management will not only protect the banks from potential losses but also ensure smoother operations and long-term sustainability.

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YEAR	DMBS	ID	SECTOR	ROA	CAR	OPR	FLR
2014	Access Bank Plc	1	Financial	0.015	0.592	0.173	0.194

DATA

Year	Company						
2015		1	Financial	0.037	0.547	0.119	0.169
2016		1	Financial	0.013	0.605	0.125	0.149
2017		1	Financial	0.004	0.614	0.125	0.144
2018		1	Financial	0.013	0.595	0.128	0.145
2019		1	Financial	0.017	0.541	0.125	0.156
2020		1	Financial	0.056	0.420	0.052	0.149
2021		1	Financial	0.005	0.380	0.118	0.145
2022		1	Financial	0.232	0.307	0.192	0.385
2023		1	Financial	0.018	0.485	0.079	0.253
2014	Ecobank Nigeria Plc	2	Financial	0.867	0.217	0.015	0.502
2015		2	Financial	0.205	0.177	0.018	0.585
2016		2	Financial	0.250	0.205	0.013	0.737
2017		2	Financial	0.309	0.221	0.013	0.819
2018		2	Financial	0.318	0.228	0.017	0.890
2019		2	Financial	0.212	0.218	0.015	0.856
2020		2	Financial	0.210	0.207	0.011	0.666
2021		2	Financial	0.117	0.224	0.010	0.557
2022		2	Financial	0.105	0.296	0.011	0.539
2023		2	Financial	0.115	0.278	0.010	0.516
2014	FCMB	3	Financial	0.714	0.195	0.098	0.020
2015		3	Financial	0.007	0.165	0.076	0.693
2016		3	Financial	0.016	0.205	0.086	0.706
2017		3	Financial	0.004	0.239	0.179	0.682
2018		3	Financial	0.009	0.253	0.088	0.597
2019		3	Financial	0.011	0.289	0.100	0.551
2020		3	Financial	0.011	0.123	0.088	0.570
2021		3	Financial	0.012	0.123	0.075	0.571
2022		3	Financial	0.003	0.123	0.268	0.505
2023		3	Financial	0.130	0.147	0.283	0.486
2014	Fidelity Bank Plc	4	Financial	0.227	0.227	0.019	0.544
2015		4	Financial	0.068	0.175	0.396	0.000

Year	Bank	No	Sector				
2016		4	Financial	0.410	0.193	0.787	0.000
2017		4	Financial	0.192	0.192	0.356	0.000
2018		4	Financial	0.288	0.169	0.330	0.000
2019		4	Financial	0.116	0.169	0.825	0.000
2020		4	Financial	0.270	0.140	0.259	0.000
2021		4	Financial	0.269	0.188	1.450	0.000
2022		4	Financial	0.227	0.206	0.946	0.000
2023		4	Financial	0.002	0.182	0.687	0.000
2014	First Bank of Nigeria	5	Financial	0.242	0.289	0.049	0.482
2015		5	Financial	0.579	0.219	0.034	0.528
2016		5	Financial	0.740	0.249	0.048	0.661
2017		5	Financial	0.460	0.197	0.058	0.751
2018		5	Financial	0.237	0.173	0.056	0.906
2019		5	Financial	0.000	0.311	0.058	0.992
2020		5	Financial	0.501	0.167	0.048	0.868
2021		5	Financial	0.000	0.183	0.044	0.920
2022		5	Financial	0.288	0.182	0.042	0.781
2023		5	Financial	0.011	0.201	0.032	0.819
2014	GT Bank	6	Financial	0.000	0.191	0.249	0.000
2015		6	Financial	0.000	0.177	0.296	0.000
2016		6	Financial	0.175	0.184	0.070	0.324
2017		6	Financial	0.062	0.215	0.079	0.277
2018		6	Financial	0.225	0.233	0.123	0.000
2019		6	Financial	0.344	0.207	0.289	0.000
2020		6	Financial	0.000	0.113	0.266	0.000
2021		6	Financial	0.000	0.127	0.231	0.000
2022		6	Financial	0.000	0.170	0.096	0.000
2023		6	Financial	0.017	0.174	0.093	0.000
2014	Jaiz Bank Plc	7	Financial	0.056	0.240	0.092	0.700
2015		7	Financial	0.053	0.239	0.081	0.735
2016		7	Financial	0.047	0.214	0.728	0.821

Year	Bank	ID	Sector				
2017		7	Financial	0.046	0.182	0.775	0.890
2018		7	Financial	0.056	0.199	0.080	0.843
2019		7	Financial	0.062	0.255	0.080	0.746
2020		7	Financial	0.071	0.420	0.069	0.572
2021		7	Financial	0.069	0.413	0.062	0.623
2022		7	Financial	0.050	0.259	0.506	0.000
2023		7	Financial	0.122	0.238	0.519	0.000
2014	Stanbic IBTC	8	Financial	0.092	0.720	0.180	0.249
2015		8	Financial	0.026	0.951	0.136	0.959
2016		8	Financial	0.034	0.958	0.430	0.117
2017		8	Financial	0.031	0.124	0.368	0.118
2018		8	Financial	0.030	0.873	0.338	0.157
2019		8	Financial	0.027	0.822	0.336	0.264
2020		8	Financial	0.032	0.754	0.204	0.154
2021		8	Financial	0.038	0.687	0.269	0.276
2022		8	Financial	0.031	0.595	0.161	0.189
2023		8	Financial	0.034	0.489	0.159	0.250
2014	Sterling Bank	9	Financial	0.009	0.284	0.041	0.000
2015		9	Financial	0.027	0.335	0.093	0.000
2016		9	Financial	0.065	0.321	0.176	0.000
2017		9	Financial	0.084	0.219	0.246	0.000
2018		9	Financial	0.071	0.265	0.180	0.000
2019		9	Financial	0.072	0.231	0.161	0.000
2020		9	Financial	0.065	0.211	0.125	0.000
2021		9	Financial	0.064	0.164	0.113	0.000
2022		9	Financial	0.055	0.201	0.111	0.000
2023		9	Financial	0.062	0.229	0.109	0.000
2014	UBA	10	Financial	0.019	0.163	0.331	0.000
2015		10	Financial	0.123	0.183	0.219	0.000
2016		10	Financial	0.017	0.168	0.119	0.000
2017		10	Financial	0.105	0.183	0.310	0.000

Year	Bank	No.	Sector				
2018		10	Financial	0.008	0.210	0.122	0.000
2019		10	Financial	0.261	0.205	0.024	0.000
2020		10	Financial	0.177	0.218	0.016	0.000
2021		10	Financial	0.190	0.198	0.437	0.000
2022		10	Financial	0.143	0.196	0.340	0.000
2023		10	Financial	0.207	0.161	0.952	0.000
2014	Union Bank	11	Financial	0.014	0.020	0.108	0.491
2015		11	Financial	0.014	0.015	0.107	0.564
2016		11	Financial	0.051	0.138	0.078	0.566
2017		11	Financial	0.044	0.148	0.046	0.531
2018		11	Financial	0.045	0.438	0.271	0.481
2019		11	Financial	0.356	0.129	0.725	0.207
2020		11	Financial	0.862	0.346	0.025	0.967
2021		11	Financial	0.419	0.400	0.021	0.813
2022		11	Financial	0.719	0.479	0.017	0.000
2023		11	Financial	0.130	0.400	0.018	0.541
2014	Unity Bank	12	Financial	0.239	0.238	0.038	0.403
2015		12	Financial	0.169	0.219	0.037	0.458
2016		12	Financial	0.153	0.155	0.044	0.515
2017		12	Financial	0.215	0.200	0.050	0.514
2018		12	Financial	0.187	0.197	0.043	0.644
2019		12	Financial	0.163	0.202	0.052	0.630
2020		12	Financial	0.162	0.197	0.042	0.501
2021		12	Financial	0.152	0.204	0.041	0.561
2022		12	Financial	0.122	0.197	0.033	0.476
2023		12	Financial	0.112	0.218	0.037	0.439
2014	Wema Bank	13	Financial	0.000	0.197	0.104	0.282
2015		13	Financial	0.001	0.248	0.095	0.435
2016		13	Financial	0.000	0.164	0.115	0.575
2017		13	Financial	0.000	0.153	0.096	0.601
2018		13	Financial	0.000	0.133	0.085	0.768

Year		ID	Sector				
2019		13	Financial	0.001	0.178	0.094	0.605
2020		13	Financial	0.001	0.113	0.080	0.507
2021		13	Financial	0.001	0.159	0.064	0.621
2022		13	Financial	0.001	0.175	0.056	0.610
2023		13	Financial	0.754	0.146	0.043	0.638
2014	Zenith Bank	14	Financial	0.165	0.133	0.101	0.583
2015		14	Financial	0.571	0.138	0.088	0.546
2016		14	Financial	0.267	0.020	0.110	0.788
2017		14	Financial	0.011	0.215	0.087	0.905
2018		14	Financial	0.005	0.470	0.069	0.882
2019		14	Financial	0.303	0.198	0.025	0.030
2020		14	Financial	0.016	0.214	0.027	0.127
2021		14	Financial	0.012	0.201	0.041	0.284
2022		14	Financial	0.004	1.013	0.033	0.436
2023		14	Financial	0.589	0.862	0.035	0.578