

Effect of Risk Management on Financial Performance of Listed Deposit Money Banks in Nigeria

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Abstract

This study examined the effect of risk management on the financial performance of 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, credit risk has positive but insignificant effect on the financial performance of the listed deposit money banks in Nigeria. While, interest risk and liquidity risk have positive and significant effect on financial performance of deposit money banks in Nigeria. The study concluded that risk management influence financial performance of listed deposit money banks in Nigeria. The study therefore study recommends among others deposit money banks in Nigeria should improve on their credit risk management practice by way of implementing effective credit assessment, monitoring, and recovery mechanisms to minimize the impact of credit risk on their financial performance. They should also focus on diversifying their loan portfolios, setting appropriate credit limits, and strengthening their credit risk modeling and analysis capabilities to enhance their resilience to credit-related shocks.

Keywords: Credit Risk, Deposit Money Banks, Financial Performance, Interest Risk, Liquidity Risk, Return on Assets, Risk Management, Nigeria

1. Introduction

The financial performance of Deposit Money Banks (DMBs) is a crucial aspect of the overall stability and efficiency of the banking sector. Globally, the banking sector has undergone significant changes over the past few decades, particularly in the aftermath of the 2008 financial crisis, which underscored the importance of robust risk management practices (Ayodeji & Adebayo, 2023). These practices are now essential for maintaining banks' financial health, helping them mitigate risks and sustain profitability

in an increasingly complex financial landscape. In Nigeria, the performance of DMBs has been shaped by factors such as economic instability, regulatory reforms, and fluctuating oil prices, which significantly influence the country's economy. The sector has faced multiple challenges, including increased level of Non-Performing Loans (NPLs) in the credit portfolio of banks (Bello & Umar, 2019), inadequate capital, and liquidity shortages, all of which have affected the profitability and stability of Nigerian DMBs (Kumshe et

al., 2024). These challenges highlight the critical need for effective risk management practices to safeguard the financial health of banks. Financial performance, typically measured by metrics such as Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM), reflects the profitability and operational efficiency of these banks. However, this study used return on assets (ROA) to measure financial performance.

Risk management in the banking sector involves identifying, assessing, and controlling threats to an institution's capital and earnings. These risks can stem from various sources, including credit risk, market risk, operational risk, and liquidity risk. Effective risk management is crucial for the sustainability and financial performance of banks, as it helps mitigate potential losses and ensures compliance with regulatory standards. In the wake of global financial crises, banks worldwide have been increasingly focused on strengthening their risk management frameworks to enhance resilience against economic shocks (Moudud-Ul-Huq, 2018). The importance of risk management in Nigeria's banking sector cannot be overstated, especially given the country's economic volatility and the significant role of banks in its financial system. The 2009 banking crisis in Nigeria, which led to the collapse of several banks, underscored the vulnerabilities in the sector's risk management practices (Sanusi, 2010). In response, there have been concerted efforts by both banks and regulators to enhance risk management frameworks, focusing on improving capital adequacy, asset quality, credit risk, interest risk management and liquidity management (Nwosu, 2019). However, the effectiveness of these efforts in improving the financial performance of banks remains a critical area of investigation. Therefore, this study used

credit risk, interest risk and liquidity risk to measure risk management.

Credit risk associate with the possibility that a borrower may default on a loan, is a significant issue for Deposit Money Banks (DMBs) in Nigeria and has a strong effect on their financial performance. Credit risk play an important role on banks' financial performances as loans from which interest is derived serves as the main source from which banks' revenue accrues, therefore, the deterioration of credit quality in form of increased level of Non-Performing Loans in the credit portfolio of banks should be an issue of concern to bank management (Bello & Umar, 2019).

High levels of credit risk contribute to an increase in non-performing loans (NPLs), which reduces bank profitability by lowering interest income and raising loan loss provisions (Eke & Osagie, 2019). The Nigerian banking sector has faced persistent challenges with high NPL ratios, often worsened by economic instability and weak risk management practices. These difficulties not only reduce banks' profitability but also negatively affect their liquidity and capital adequacy, weakening their overall financial health (Afolabi et al., 2020). Therefore, managing credit risk effectively is crucial for Nigerian DMBs to maintain financial stability and ensure sustainable profitability in an unpredictable economic.

Interest rate risk, associated with the potential for financial losses due to fluctuations in interest rates, poses a significant challenge for Deposit Money Banks (DMBs) in Nigeria. Unexpected increases or decreases in interest rates can create a mismatch between the interest earned on assets and the interest paid on liabilities, leading to reduced net interest margins (NIM) and diminished profitability

(Agboola et al., 2022). Given Nigeria's often volatile economic landscape, marked by sudden shifts in interest rates due to monetary policy changes or inflationary pressures, DMBs are particularly vulnerable to this risk. Poor management of interest rate risk can result in substantial financial instability, as banks struggle to maintain balanced balance sheets, which can lower earnings and weaken capital positions (Ogunbiyi & Ihejirika, 2023). Therefore, effective management of interest rate risk is crucial for Nigerian banks to safeguard their financial performance and ensure long-term sustainability.

More so, liquidity risk, the risk that a bank will not be able to meet its short-term financial obligations due to an inability to convert assets into cash without significant loss, is a critical concern for Deposit Money Banks (DMBs) in Nigeria. When a bank faces liquidity issues, it may struggle to meet depositor demands or settle other liabilities, leading to a loss of confidence among stakeholders and potentially triggering bank runs (Nwosu, 2019). In the Nigerian banking sector, where economic conditions are often unpredictable, managing liquidity risk is particularly challenging. Poor liquidity management can result in higher borrowing costs, reduced profitability, and even insolvency if not adequately addressed (Olawaju & Adeyemi, 2015). Therefore, effective liquidity risk management is essential for Nigerian DMBs to ensure financial stability, maintain profitability, and sustain operations during periods of economic stress.

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 risk management on performance of listed deposit money Banks in Nigeria. Specifically, it seeks to explore the effects of credit risk, interest rate risk, and liquidity risk on the performance of listed DMBs in Nigeria, addressing gaps in the current understanding.

2. Literature Review

2.1. Financial Performance

Financial performance is the extent to which a firm achieves financial efficiency in terms of future expectations on return on

production investment, marketing investment and increase in sales (Suleiman, Aliyu & Bello, 2021). Financial performance is therefore, a key indicator of a company's overall financial health and its ability to generate profits, manage resources efficiently, and meet financial obligations. It reflects the outcomes of a firm's policies and operations in monetary terms, it refers to the assessment of a firm's financial health and its ability to generate profit, sustain growth, and meet its financial obligations, typically measured through key indicators such as return on assets (ROA), return on equity (ROE), and profit margins (Alqaraleh, 2023). In the banking sector, financial performance is especially critical, as it reflects a bank's efficiency in managing risks, liquidity, and capital adequacy, which are essential for ensuring long-term stability (Olokoyo & Osabuohien, 2023). For Deposit Money Banks (DMBs), financial performance encompasses not only profitability but also their resilience in navigating regulatory challenges and economic shocks, highlighting the importance of robust risk management practices (Adeyemi, 2023). Evaluating these performance indicators is crucial for stakeholders, such as regulators, investors, and management, to ensure sustainable growth and financial stability in an increasingly volatile economic environment.

Financial performance is widely recognized as a critical indicator of a company's ability to generate revenues, manage expenses, and efficiently utilize its assets to achieve profitability and create value for its shareholders. Alijarde and González (2019) describe financial performance as the capacity of a firm to manage its resources efficiently to generate revenue and control costs, emphasizing its role in assessing the company's 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 defines financial performance as reflecting a company's ability to generate net income and cash flows, while also measuring the efficiency of asset deployment. The comprehensive nature of financial performance is reinforced by Malik (2020), who notes that it captures the outcomes of a firm's policies in monetary terms, including key metrics like return on investment (ROI) and return on assets (ROA). Nawaiseh (2022) expands on this by emphasizing financial performance as a holistic assessment of a firm's financial health and operational success, which is crucial for informed investment decisions. Various methods of measuring financial performance have been highlighted, including ROI, ROA, return on equity (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, focusing on how effectively a company can use its assets to generate revenue and achieve its financial objectives. In summary, financial performance encompasses the overall financial health of a company, gauging its ability to manage resources, generate profits, and meet financial goals, with ROA being a common measure used in the assessment of a firm's success.

2.1.1 Return on Assets (ROA)

Financial performance is evaluated through various metrics, each offering distinct insights into a company's operations. 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 measures the returns generated on shareholders' equity, providing insight into investor returns (Ullah et al.,

2021). ROI assesses the efficiency of specific investments relative to their costs (Chowdhury & Rasid, 2017), while EPS indicates profit per share, reflecting shareholder value (Akter et al., 2021).

Among these, return on assets (ROA) is one of the most comprehensive indicators of financial performance, especially in industries like banking. ROA evaluates how efficiently a company uses its total assets to generate profit (Akani & Swenem, 2019), reflecting both profitability and asset utilization. This metric is particularly useful for cross-company comparisons as it standardizes profitability relative to asset size, offering consistency across industries (Agostini et al., 2020). For this reason, ROA is frequently chosen in financial performance studies for its ability to capture both profitability and efficiency

According to Akani and Swenem (2019), return on assets (ROA) is a financial performance indicator that measures a company's profitability in relation to its total assets. ROA can be used by corporate management, analysts, and investors to assess how effectively a company uses its resources to make a profit. The metric is frequently represented as a percentage using the net income and average assets of a corporation (Smith & Johnson, 2023). A company's ability to manage its balance sheet to produce profits is more effective and efficient when its ROA is higher; on the other hand, a lower ROA suggests there is potential for improvement (Akani & Swenem, 2019).

Return on Assets (ROA) is defined as the ratio of income to total assets, which measures a company's ability to generate profits from its available assets (Bello & Umar, 2019; Katchova & Enlow, 2013). This metric reflects the efficiency with

which a firm utilizes its assets to generate earnings, and it is a key indicator of a company's profitability and overall financial performance (Akter et al., 2021). According to Martínez-Sola et al. (2019), ROA is a profitability ratio that calculates the net income generated per unit of asset, and it is used to evaluate a company's ability to efficiently utilize its assets to generate profits. This metric provides insights into the operational efficiency of a firm and the effectiveness of its management in using the company's resources to generate earnings (Agostini et al., 2020).

ROA is a financial ratio that measures the efficiency of a company in generating profits from its total assets. It is calculated as the ratio of net income to total assets, and it is a widely used indicator of a firm's overall financial performance and competitiveness (Ullah et al., 2021). ROA gives a sense of how effectively a company is leveraging its resources to create profits, making it a valuable metric for evaluating a firm's financial health and management effectiveness (Chowdhury & Rasid, 2017). ROA measures the efficiency of a company in using its assets to generate profits. It is calculated as the ratio of net income to total assets. A higher ROA indicates that the company is effectively utilizing its assets to generate earnings (Agostini et al., 2020).

2.1.2 Risk Management

Risk management is a systematic process involving the identification, analysis, and response to potential risks that may affect an organization's ability to meet its objectives. According to Oliva (2016) and others, this process is essential for ensuring long-term sustainability by mitigating, transferring, or

avoiding risks. It involves coordinated activities to control risk (Aven, 2016), including assessing and prioritizing threats to minimize their impact (Yaraghi & Langhe, 2011). Risk management spans various risk types, such as financial, operational, strategic, and compliance risks (Frigo & Anderson, 2011; Lalonde & Boiral, 2012). The process is ongoing and dynamic, adapting to evolving risks that continuously threaten organizations (Tasmin & Muazu, 2017). Brustbauer (2016) emphasized that effective risk management is key to safeguarding a company's capital and earnings, ensuring its long-term viability.

In the banking context, risk management involves understanding and managing diverse risks, including credit, interest rate, liquidity, operational, and foreign exchange risks (Nwude & Okeke, 2018). Strong risk management practices are crucial for financial stability and contribute significantly to a bank's ability to achieve its strategic goals and provide value to stakeholders. The proactive approach of risk management ensures that organizations effectively allocate resources to address uncertainties and capitalize on potential opportunities (Lam, 2014; Aon, 2020).

In this context, this study views risk management as a vital, continuous process that enhances organizational governance and operational performance. By integrating comprehensive strategies to mitigate risks, banks and other organizations can maintain financial stability and achieve long-term success, contributing to value creation for their stakeholders.

2.1.2.1 Credit Risk

Credit risk refers to the potential for financial loss arising from the failure of a borrower or counterparty to meet its financial obligations, such as repaying principal or interest, leading to interrupted

cash flows and additional costs for recovery (Hasan & Dridi, 2011; Miao et al., 2017). It is one of the most significant risks faced by banks, especially in traditional lending activities, where the possibility of default can result in a deterioration of the lender's financial performance and stability (Fiordelisi et al., 2017; Fungáčová & Weill, 2013). Effective credit risk management is essential for Deposit Money Banks (DMBs), as higher levels of credit risk increase the likelihood of financial failure (Hempel & Simonson, 2019). Banks that successfully manage credit risk are better equipped to maintain profitability, financial stability, and access to capital markets, which are essential for long-term success (Afolabi et al., 2020).

Based on these views, this study conceptualizes credit risk as the potential for a borrower or counterparty to default on its financial obligations, resulting in a direct impact on the lender's financial health. Effective credit risk management, therefore, plays a crucial role in safeguarding the financial performance of DMBs and ensuring their sustainability in a competitive financial environment. By mitigating these risks, banks can enhance their profitability and resilience, which is vital for achieving their strategic goals and maintaining financial stability.

2.1.2.2 Interest Rate Risk

Interest rate risk refers to the potential for financial losses arising from fluctuations in interest rates, which can affect the value of financial instruments such as bonds and the overall profitability of financial institutions. When interest rates increase, the market value of fixed-income investments declines, and conversely, when interest rates decrease, the value of these investments rises (Ballester et al., 2016; Aljalbani, 2020). The quality of credit quality on

balance sheets of banks is also a function of credit risk exposure levels (Bello & Umar, 2019). This risk is particularly significant for banks and financial institutions, where mismatches in the maturities of assets and liabilities expose them to changes in net interest income and economic value (Khan & Khan, 2018; Saunders & Cornett, 2018). Interest rate risk is driven by the sensitivity of a financial institution's portfolio to changes in the general interest rate environment, which directly impacts its stability and profitability (Jiang et al., 2019).

In this study, interest rate risk is a critical factor for financial institutions, as it directly affects the value of their assets and liabilities, especially those involving fixed-income securities. Managing this risk is essential to maintaining financial stability, as shifts in interest rates can lead to substantial changes in the market value of investments and overall profitability. Therefore, this study conceptualizes interest rate risk as the potential for financial losses due to fluctuations in interest rates, emphasizing its relevance for banks and other financial institutions that hold significant fixed-income assets or face maturity mismatches between their assets and liabilities.

2.1.2.3 Liquidity Risk

Liquidity risk refers to the possibility that a financial institution or other entity may be unable to meet its short-term financial obligations due to insufficient liquid assets or cash. According to Berger and Bouwman (2017), this risk arises when short-term cash inflows are not adequate to cover short-term cash outflows, which could lead to insolvency. Liquidity risk can emerge from unexpected withdrawals, the inability to roll over short-term funding, or the need to

finance asset growth (Acharya & Mora, 2015). Proper management of liquidity risk is essential to avoid disruptions in operations and ensure that institutions can meet their liabilities without incurring significant losses (Hasan et al., 2020; Muriithi, 2016). In this study, liquidity risk can be conceptualized as the risk that an individual, company, or financial institution will not have sufficient liquid assets or cash to fulfill their short-term financial obligations when they fall due. It highlights the importance of maintaining an appropriate balance between assets and liabilities and ensuring access to adequate funding sources to avoid potential insolvency. Effective liquidity management is crucial for financial stability and smooth business operations.

2.2 Empirical Review

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

2.2.1 Credit Risk and Financial Performance

Aryal (2023) examined the effect of credit risk on the financial performance of commercial banks in Nepal, employing both descriptive and causal-comparative research designs. The study analyzed pooled data from 14 commercial banks over a five-year period (2017/18 to 2021/22) using a regression model. The results indicated that the credit-to-deposit ratio significantly influences bank performance. However, the non-performing loan ratio had an insignificant and negative effect on financial performance. A limitation of the study is its coverage of only a five-year period, which may affect the reliability and generalizability of the findings.

Ukpong and Essien (2022) determined the relationship between credit risks and the financial performance of quoted commercial banks in Nigeria. The research design employed in this study was the Ex-post facto research design. The population comprised the top 10 commercial banks in Nigeria as of December 2021 with updated financial statements up to 2021. The study covered a period of five years - 2017 to 2021. The study utilized secondary data that were extracted from the annual report and accounts of the commercial banks. Descriptive statistics were used to analyze data and regression analysis was used to analyze the research hypotheses. The findings of the study revealed a significant relationship between credit risks and financial performance. The five-year period (2017-2021), though recent, may not fully reflect the long-term impacts of credit risks on bank performance, especially during periods of economic instability or external shock

Mushafiq et al. (2021) investigated the relationship between credit risk and financial performance in non-financial firms, using the Altman Z-score model as a proxy for credit risk and Return on Assets (ROA) and Return on Equity (ROE) as indicators of financial performance. The study also incorporated leverage, liquidity, and firm size as control variables. Using Least Square Dummy Variable regression analysis, data from 69 non-financial companies listed on the Pakistan Stock Exchange KSE-100 Index between 2012 and 2017 were analyzed. The findings revealed that the Altman Z-score, leverage, and firm size significantly affect financial performance, with Altman Z-score and firm size showing a positive relationship, while leverage had a negative effect. However, liquidity was found to be insignificant. A limitation of the study is its focus on non-

financial firms in Pakistan, which may restrict the generalizability of the results to other sectors or regions. The study covered non-financial companies from the Pakistan which could limit the generalization of its findings to other sector.

Munangi and Sibindi (2020) examined the impact of credit risk on the financial performance of 18 South African banks for the period 2008 to 2018. Panel data techniques, namely the pooled ordinary least squares (pooled OLS), fixed effects and random effects estimators were employed to test the relationship between credit risk and financial performance (proxied by non-performing loans (NPLs) and by return on assets (ROA) and return on equity (ROE) respectively). The study found that credit risk was negatively related to financial performance. The study focused only on indicators of credit risk which is only one out of many proxies to measure risk management.

2.2.2 Interest Rate Risk and Financial Performance

Belinda and Irawati (2024) examined the effect of interest rate risk on financial performance, with a focus on the mediating role of banking security levels in commercial banks listed on the Indonesia Stock Exchange. The study analyzed data from 24 banks between 2019 and 2022 using multiple linear regression. The findings indicated that interest rate risk significantly influences both banking security levels and financial performance, with banking security mediating the relationship between interest rate risk and financial performance. The study is its focuses on Indonesian banks, which may restrict the generalizability of the results to other regions.

Onyango and Kalunda (2023) investigated the Interest Rate Risk and Financial Performance of Investment Banks in Kenya to understand how interest rate risk influences financial outcomes. The study used an explanatory sequential mixed-method design, drawing on a population of 16 Kenyan investment banks from 2011 to 2019. Quantitative data was sourced from annual financial statements, while primary data was collected through interviews with key informants, including managers. Regression analysis revealed that interest rate risk had a low but positive and significant influence on financial performance, particularly return on assets (ROA). The study covered only nine (9) year's period.

Bemshima et al. (2022) examined the impact of interest rates on the financial performance of listed manufacturing firms in Nigeria from 2009 to 2018. Financial performance was measured by return on assets (ROA) and return on equity (ROE), with interest rate (ITR) as the independent variable. Using secondary data from 28 manufacturing companies and interest rate data from the Central Bank of Nigeria, the study adopted a correlation research design with cross-sectional and time-series data. Panel multiple regression analysis, conducted via Eviews-10, revealed that interest rates significantly impacted ROA but had no significant effect on ROE. The study focused on manufacturing firms, which differs from research on Deposit Money Banks (DMBs).

2.2.3 Liquidity Risk and Financial Performance

Aregbesola, Wright, Kolawole, and Omojola (2024) examined the impact of liquidity risk and leverage on the financial performance of Nigerian deposit money banks. The objective was to assess how liquidity risk

and leverage affect the profitability of 15 listed deposit money banks in Nigeria from 2013 to 2022. Using a census approach, the study employed descriptive statistics, correlation analysis, and multiple regression analysis. The findings revealed that liquidity risk positively impacted return on equity (ROE), while leverage had a negative effect on profitability. The study highlighted the need for effective liquidity and leverage management to enhance financial performance. A limitation of the study is its sole focus on Nigerian banks, which may not allow for generalization to banks in other regions.

Udenwa, Suberu, and Jacob (2023) conducted a study titled effect of liquidity risk on the financial performance of quoted deposit money banks in Nigeria, aiming to analyze how liquidity risk influences financial performance using Return on Assets (ROA) as a metric. The research employed a panel data design, focusing on a population of 11 quoted deposit money banks from 2014 to 2021. Secondary data was collected from the annual financial reports of the banks. The method of analysis included panel regression models. The findings indicated that liquidity risk, measured through loans and advances to total assets and loans to deposits ratios, significantly affected the financial performance of the banks. The study covered only seven (7) year's period which limit the generalization of its finding.

Alim et al. (2023) investigated the effect of liquidity risk management on financial performance of commercial banks in Pakistan. The objective was to analyze how liquidity risk management affects bank profitability, using Return on Assets (ROA) and Return on Equity (ROE) as performance indicators. The study adopted a panel data

approach, analyzing financial data from 2006 to 2019 of all commercial banks in Pakistan, sourced from the State Bank of Pakistan. The study employed Ordinary Least Square regression analysis. Results indicated that liquidity have positive and significant effect on financial performance of banks. A critique of the study is its limited focus on Pakistani commercial banks, which may not fully represent banks in other financial environments.

Ratemo (2021) explored the liquidity risk and financial performance of commercial banks in Kenya. the objective was to examine how liquidity risk affects the financial performance of commercial banks. The study used a causal research design and collected secondary data from financial books and reports of 42 commercial banks operating in Kenya from 2012 to 2017. Data was analyzed using Stata 14.0, applying both descriptive and panel regression models. The findings showed that asset quality negatively impacted financial performance, while operational efficiency and bank size positively affected it. One limitation of the study was its narrow focus on Kenyan banks, potentially limiting its applicability in other regions.

2.3 Theoretical Framework

This study is hinged on the Risk Management Theory. The Risk Management Theory propounded by Sharpe in 1964 through his development of the Capital Asset Pricing Model (CAPM). The central premise of the Risk Management Theory is that risk should be actively managed and minimized to enhance financial performance (Sharpe, 1964). The theory emphasizes the importance of identifying, measuring, and controlling various types of risks, such as market risk, credit risk, operational risk, and

liquidity risk, that can affect the financial performance of an organization.

Several other scholars have built upon the foundations of the Risk Management Theory and contributed to its development: Harry Markowitz: Markowitz's modern portfolio theory, which focuses on the relationship between risk and return, is closely related to the Risk Management Theory (Markowitz, 1952). Merton Miller and Franco Modigliani: Their work on the irrelevance of capital structure in a perfect market provided insights into the role of risk management in corporate finance (Miller & Modigliani, 1958). Jensen and Meckling: Their agency theory highlighted the importance of risk management in aligning the interests of managers and shareholders (Jensen & Meckling, 1976). Holmström and Tirole: Their work on the role of liquidity and information in risk management contributed to the understanding of liquidity risk management (Holmström & Tirole, 1998).

While the Risk Management Theory has been widely accepted, it has also faced some criticisms: 1).Difficulty in Measuring Risk: Accurately measuring and quantifying various types of risks can be challenging, which can limit the effectiveness of risk management practices (Taleb, 2007). 2). Assumption of Rationality: The theory assumes that decision-makers are rational and can make optimal risk management decisions, which may not always be the case in practice (Kahneman & Tversky, 1979). 3). Ignoring Behavioural Factors: The theory tends to overlook the influence of behavioral factors, such as risk perception and cognitive biases, on risk management decisions (Barberis & Thaler, 2003).

Despite the criticism of the theory, it is highly relevant to the study on the effect of risk management on the financial performance of listed Deposit Money Banks (DMBs) in Nigeria for the fact the theory

provides a strong conceptual foundation for understanding the importance of effective risk management practices in the banking sector (Saunders & Cornett, 2020). Specifically, the theory suggests that banks should actively identify, measure, and control various types of risks, such as credit risk, market risk, and liquidity risk, to enhance their financial performance and mitigate the adverse effects of financial crises. The insights from the Risk Management Theory can inform the development of appropriate risk management frameworks and strategies for Nigerian DMBs, ultimately contributing to the stability and performance of the banking sector. However, this study will adopt Risk Management Theory. The justification for adopting Risk Management Theory is based on the fact that the Theory provides a well-established and comprehensive framework for identifying, assessing, and managing the diverse risks faced by deposit money banks in Nigeria. This holistic approach is crucial in understanding the impact of risk management on bank performance.

3 Research Methods

The objective of this study is to examine the effect of risk management on the financial performance of listed deposit money banks (DMBs) in Nigeria. The study employed an ex post facto research design, which is appropriate for cases where the researcher does not have control over the independent variables as they have already occurred and cannot be manipulated (Kerlinger & Lee, 2000). This design also facilitates the collection and analysis of existing data to determine the relationships between the variables of interest.

The study focused on 14 out of 19 listed DMBs in Nigeria, selected based on the availability of data. 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 study covered a 10-year period 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.

Secondary data was used, obtained from the published annual reports and financial statements of the selected banks 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

$$ROA_{it} = \beta_0 + \beta_1 CDR_{it} + \beta_2 IRR_{it} + \beta_3 LRR_{it} + \epsilon$$

Where:

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

CDR_{it} = Credit Risk i in year t

IRR_{it} = Interest Rate Risk i in year t

LRR_{it} = Liquidity Rate 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 Variable

Table 1. Variable Measurement

Variable Name & Acronym	Variable type	Variable Description/Measurement	Source
Return on Assets (ROA)	Dependent variable	$\frac{\text{Earnings before Income Tax (EBIT)}}{\text{Total Assets (TASSET)}}$	Manzaneque et al. (2021); Olatunji and Ahmadu (2019).
Credit Risk (CDR)	Independent variable	Probability of Default (PD) x Exposure at Default (EAD) x Loss Given Default (LGD)	Bellotti and Crook (2012); Dionne, (2013); Glennon and Nigro, (2005)
Interest Rate Risk (IRR)	Independent variable	$\text{Duration} = \sum (t \times Ct / (1 + r)^t) / P$	Fabozzi (2012); Saunders and Cornett (2014). Hull (2018)
Liquidity Rate Risk (LRR)	Independent variable	$\text{Liquidity Coverage Ratio (LCR)} = \frac{\text{High-Quality Liquid Assets (HQLA)}}{\text{Total Net Cash Outflows over the Next 30 Calendar Days}}$	Crouhy et al. (2014); Saunders and Cornett (2014).

Source: Researcher's Compilation, 2024

3. Results and discussion

This section provides results from the data analysis and discussions of findings were made. It presents the key findings derived from the data analysis and provides a comprehensive interpretation of these results in relation to the research objectives and hypotheses. In this section, the results of the statistical analyses were typically presented in a clear and structured manner, using tables, and figures to enhance understanding. The discussion then contextualizes the findings, comparing them

with previous studies and theories within the literature. This section also highlights the implications of the results for the field. Additionally, it addresses whether the hypotheses have been supported or refuted, offering insights into the practical and theoretical significance of the research outcomes.

4.1 Descriptive Analysis

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

Table 2: Descriptive Analysis

	ROA	CDR	IRR	LRR
Mean	0.292	0.305	0.524	0.417
Median	0.312	0.346	0.435	0.470
Maximum	0.629	0.674	0.841	0.8176
Minimum	0.110	0.270	0.250	0.399
Std. Dev.	1.221	2.847	15.126	2.494
Skewness	-0.064	-0.012	0.313	-0.003
Kurtosis	1.625	1.595	3.421	1.757
Jarque-Bera	1.026	1.068	0.308	0.835
Probability	0.599	0.586	0.856	0.658
Sum	38.049	39.777	68.178	54.218
Sum Sq. Dev.	59.12057	71.083	27.709	81.5747
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: CDR (Credit Risk), IRR (Interest Rate Risk) and LRR (Liquidity Rate Risk).

The descriptive statistical analysis for Return on Assets (ROA) shows the Mean value of 0.292 which indicates that on average, the return on assets is 29.2%., Median value of 0.312. The median ROA is 31.2%, suggesting that the distribution is slightly skewed. Maximum value of 0.629 which shows that the maximum ROA observed is 62.9%., Minimum value of 0.110 which indicate that the minimum ROA observed is 11.0%. The Std. Dev value of 1.221 indicates that the ROA values have a relatively high degree of dispersion around the mean. Skewness value of -0.064 which show that the distribution of ROA is slightly negatively skewed, indicating a longer left tail. Kurtosis value of 1.625 which shows

the distribution has a kurtosis value less than 3, suggesting a flatter distribution compared to a normal distribution. The Jarque-Bera value of 1.026 with Probability value of 0.599 suggests that the ROA data follows a normal distribution.

While, the descriptive statistical analysis for Credit Risk (CDR) shows Mean value of 0.305, meaning that the average credit risks level is 30.5%. The Median value of 0.346 indicates that the median credit risk level is 34.6%, while the Maximum value of 0.674 shows that the maximum credit risk level observed is 67.4%. The Minimum value of 0.270 revealed that the minimum credit risk level observed is 27.0% and the Std. Dev. value of 2.847 show the credit risk values have a relatively high degree of dispersion around the mean. The Skewness value of -0.012 show that he distribution of credit risk is slightly negatively skewed, indicating a longer left tail. The Kurtosis value of 1.595 mean that the distribution has a kurtosis value less than 3, suggesting a flatter distribution compared to a normal

distribution. The Jarque-Bera value of 1.068 and its corresponding Probability value of 0.586 suggest that the credit risk data follows a normal distribution.

Similarly, the descriptive statistical analysis for Interest Rate Risk (IRR) shows the Mean value of 0.524 which indicate the average interest rate risk level is 52.4% and the Median value of 0.435 means that the median interest rate risk level is 43.5%. The Maximum value of 0.841 means that the maximum interest rate risk level observed is 84.1%. The Minimum value of 0.250 which show that the minimum interest rate risk level observed is 25.0% and the Std. Dev. value of 15.126 which mean that the interest rate risk values have a very high degree of dispersion around the mean. The Skewness value of 0.313 shows that the distribution of interest rate risks is slightly positively skewed, indicating a longer right tail. The Kurtosis value of 3.421 shows that the distribution has a kurtosis value greater than 3, suggesting a more peaked distribution compared to a normal distribution. The Jarque-Bera value of 0.308 and its corresponding Probability of 0.856 suggest that the interest rate risk data follows a normal distribution.

Finally, the descriptive statistics for Liquidity Risk (LRR) show the Mean value of 0.417 indicates that the average liquidity risk level is 41.7 percent. The Median value of 0.470 means that the median liquidity risk level is 47.0 percent, while the Maximum value of 0.8176 means that the maximum

liquidity risk level observed is 81.76 percent. The Minimum value of 0.399 indicates the minimum liquidity risk level observed is 39.9 percent. The Std. Dev. Value of 2.494 indicates that the liquidity risk values have a relatively high degree of dispersion around the mean. The Skewness value of -0.003 – means the distribution of liquidity risk is almost symmetrical, the Kurtosis value of 1.757 indicates that the distribution has a kurtosis value less than 3, suggesting a flatter distribution compared to a normal distribution. The Jarque-Bera value of 0.835 and its corresponding Probability value of 0.658 suggest that the liquidity risk data follows a normal distribution.

Overall, the data suggests that the variables have varying degrees of dispersion, skewness, and kurtosis, which can have implications for risk management, decision-making, and further analysis. The normality of the distributions, as indicated by the Jarque-Bera test, suggests that parametric statistical methods can be appropriately applied to the data. Therefore, this study relied on the above result and straightway conducts Pearson's correlation and Regression analysis.

4.2 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: 22/078/24 Time: 11:35

Sample: 2014 2023

Included observations: 140

Number of groups: 14

Correlation					
Probability	ROA	CDR	IRR	LRR	
ROA	1.000				

CDR	0.131	1.000			
	0.000	-----			
IRR	0.102	0.112	1.000		
	0.000	0.000	-----		
LRR	0.093	0.105	0.142	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), CDR (Credit Risk), IRR (Interest Rate Risk), and LRR (Liquidity Risk).

The result shows that There is a positive correlation between Return on Assets (ROA) and Credit Risk (CDR) with a correlation coefficient of 0.131. The correlation between ROA and Interest Rate Risk (IRR) is 0.102, indicating a weak positive relationship. Also, there is a weak positive correlation between ROA and Liquidity Risk (LRR), with an r value of 0.093. Similarly, a weak positive correlation exists between Credit Risk (CDR) and Interest Rate Risk (IRR), with a coefficient of 0.112. in addition, the correlation between Credit Risk (CDR) and Liquidity Risk (LRR) is 0.105, which suggests a weak positive relationship. And there is a slightly

stronger positive correlation between Interest Rate Risk (IRR) and Liquidity Risk (LRR), with an r value of 0.142. This indicates a weak but more pronounced positive relationship compared to the others. All the correlations are weak and positive, meaning that they follow the same pattern.

Collinearity becomes a concern when the correlation between independent variables is high, typically above 0.7. In this case, none of the correlation coefficients between the independent variables (CDR, IRR, LRR) exceed 0.2, indicating that there is no significant multicollinearity issue among the risk variables. This suggests that these variables can be included together in a regression model without concern for collinearity affecting the results.

4.3 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 Credit Risk (CDR), Interest Rate Risk (IRR), and Liquidity Risk (LRR). This study used Ordinary Least Squares (OLS) regression.

OLS was appropriate for this study because it estimates the linear relationship between risk management factors (credit risk, interest rate risk, and liquidity 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: 22/078/24 Time: 11:35

Sample: 2014 2023

Included observations: 140

Group: 14

Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
C	0.01559	0.00684	2.49233	0.0254	
CDR	2.34302	2.55903	0.36408	0.4260	2.35
IRR	5.22460	1.27621	4.54434	0.0000	2.12
LRR	3. 01791	1.14327	2.544223	0.0031	1.45
R-squared	0.42442	Mean dependent var		14.6797	
Adjusted R-squared	0.34263	S.D. dependent var		3.78572	
S.E. of regression	1.263177	Akaike info criterion		3.31646	
Sum squared resid	4.462139	Schwarz criterion		3.45287	
Log likelihood	-9.442641	Hannan-Quinn criter.		3.22361	
F-statistic	25.94315	Durbin-Watson stat		1.97132	
Prob(F-statistic)	0.005123				

Source: Researcher's Computation, 2024 via EVIEWS

Table 4 presents the regression result for the effect of effect of risk management on financial performance of DMBs in Nigeria.

From the result above, VIF values are in all respective case are less 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 1.97132 is very close to 2, indicating that there is no

significant autocorrelation in the residuals. 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 R-squared value is 0.42442, indicating that the model explains approximately 42.44% of the variation in the dependent variable. The adjusted R-squared value is 0.34263, which takes into account the number of predictors in the model and is a more accurate measure of the model's explanatory power. The standard error of the regression (S.E. of regression) is 1.263177, which represents the average amount the dependent variable deviates from the regression line. The F-statistic is 25.94315, which is statistically significant (p-value = 0.005123), indicating that the model as a whole is a good fit for the data. The Durbin-Watson statistic is 1.97132, which is close to 2, suggesting that there is no significant autocorrelation in the residuals.

From the regression result in the table 4 with respect to credit risk, it revealed that credit risk (CDR) has coefficient value of 2.34302,

t-value of 0.36408 and P-value of 0.4260 which is positive but insignificant at 5% level of significant. It is therefore found that credit risk has positive but insignificant effect on financial performance of listed deposit money banks in Nigeria. The coefficient for the credit risk variable (CDR) is 2.34302. This means that for a one-unit increase in credit risk, there is a 2.34302 unit increase in the financial performance of the banks, holding all other variables constant. The t-statistic for the CDR variable is 0.36408, and the corresponding p-value is 0.4260. Since the p-value is greater than the commonly used significance level of 0.05 (5%), it implies that the effect of credit risk on financial performance of DMBs is not statistically significant at the 5% level. This result suggests that an increase in credit risk is associated with an increase in financial performance of the banks. However, this relationship is not statistically significant. This statistical analysis has not provided the sufficient ground for rejecting null hypothesis one. Therefore, the null hypothesis one which states that credit risk has no significant effect on financial performance (ROA) of DMBs in Nigeria is hereby accepted. This finding is in line with the finding of Aryal (2023) who examined the effect of credit risk on financial performance of commercial banks in Nepal and found that credit risk indicators, non-performing loan ratio has insignificant and negative effect on bank performance.

The result indicating a positive but insignificant effect of credit risk on financial performance challenges the effectiveness of credit risk management in Nigerian Deposit Money Banks. From a Risk Management

Theory perspective, the findings suggest that banks may not be managing their credit risk optimally to translate higher risk into improved financial performance. In practical terms, this highlights the need for Nigerian banks to strengthen their credit risk management frameworks, review lending policies, and adhere to stricter regulatory oversight to better align risk-taking with performance outcomes. Investors and regulators should also be mindful of these findings when assessing the health and stability of banks in the Nigerian financial system.

From the regression result in the table 4 with respect to interest rate risk and financial performance of DMBs, it revealed that interest rate risk (IRR) has coefficient value of 5.22460, t-value of 4.54434, and P-value of 0.0000 which is positive and significant at 5 percent level of significant. This means that for a one-unit increase in interest rate risk, there is a 5.22460 unit increase in the financial performance (ROA) of the banks, holding all other variables constant. The t-statistic for the IRR variable is 4.54434, and the corresponding p-value is 0.0000. Since the p-value is less than the commonly used significance level of 0.05 (5%), it implies that the effect of interest rate risk on financial performance is statistically significant at the 5 percent level. It is therefore found that interest rate risk has positive and significant effect on financial performance (ROA) of listed deposit money banks in Nigeria at 5 percent significant level. Therefore, the null hypothesis two which states that interest rate risk has no significant effect on financial performance (ROA) of DMBs in Nigeria is hereby

rejected. This finding is in line with the finding of Bemshima et al. (2022) who examined the impact of interest rate on the financial performance of listed manufacturing firms in Nigeria and found that interest rates had a significant impact on ROA.

The finding that interest rate risk has a positive and significant impact on the financial performance of Nigerian deposit money banks supports the key tenets of Risk Management Theory, which emphasizes the importance of managing financial risks to enhance profitability. From a practical perspective, this suggests that Nigerian banks are managing their exposure to interest rate fluctuations effectively, which contributes to their overall financial success. However, continued efforts are required to optimize risk management strategies, enhance regulatory oversight, and build capacity to ensure that banks can sustain their performance in the face of evolving interest rate risks.

Similarly, the regression result respect to liquidity rate risk and financial performance of DMBs, it revealed that liquidity rate risk (LRR) has coefficient value of 3.01791, t-value of 2.544223 and P-value of 0.0031 which is positive and significant at 5 percent level of significant. This means that for a unit increase in liquidity rate risk, there is a 3.01791 unit increase in the financial performance (ROA) of the DMBs, holding all other variables constant. The t-statistic for the LRR variable is 2.544223, and the corresponding p-value is 0.0031. Since the p-value is less than the commonly used significance level of 0.05 (5%), it implies

that the effect of liquidity rate risk on financial performance is statistically significant at the 5% level. It is therefore found that liquidity rate risk has positive and significant effect on financial performance (ROA) of listed deposit money banks in Nigeria at 5% significant level. Therefore, the null hypothesis three which states that liquidity rate risk has no significant effect on financial performance (ROA) of DMBs in Nigeria is hereby rejected. This finding contradicts the finding Alim et al. (2023) who investigated the effect of liquidity risk management on financial performance of commercial banks in Pakistan and found that liquidity have positive and significant effect on financial performance of banks.

The finding of liquidity rate risk has a positive and significant effect on the financial performance of Nigerian deposit money banks (DMBs) supports the Risk Management Theory by illustrating the critical role that proper liquidity management plays in enhancing profitability. From a practical standpoint, banks should continue to strengthen their liquidity risk management practices to maintain financial stability and capitalize on profitable opportunities. Regulatory compliance, operational efficiency, and strategic asset-liability management are key elements that will enable banks to optimize their liquidity positions and drive better financial performance. Investors and regulators alike should place a strong emphasis on liquidity risk management to ensure that Nigerian banks remain resilient and profitable in the face of liquidity challenges

5. Conclusions and Recommendations

Based on the findings of this study, it can be concluded that effective management of both interest rate risk and liquidity risk significantly enhances the financial performance of listed deposit money banks (DMBs) in Nigeria. The positive and significant relationships indicate that bank's strategies in managing these risks are well-implemented, contributing to improved return on assets (ROA) and overall profitability. This suggests that listed DMBs in Nigeria have developed sufficient mechanisms to mitigate the adverse impacts of interest rate fluctuations and liquidity shortages, resulting in better financial outcomes.

However, it is also conclude that despite some level of effectiveness, credit risk management practices among Nigerian DMBs are not robust enough to significantly enhance financial performance.

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

- i. DMBs in Nigeria should strengthen their credit risk management frameworks by implementing more rigorous credit assessment, monitoring, and recovery mechanisms. This includes diversifying loan portfolios, setting appropriate credit limits, and adopting advanced credit risk modeling techniques. By improving their ability to evaluate and manage credit risk, banks can reduce potential credit-related losses and improve their overall financial performance.
- ii. DMBs in Nigeria should prioritize the development of sophisticated interest rate risk management strategies. This

involves utilizing advanced financial forecasting models to anticipate interest rate movements and optimizing asset-liability management to reduce exposure to interest rate fluctuations. By improving their capacity to manage interest rate risk, banks can protect their profitability during volatile economic periods and take advantage of favorable rate conditions to enhance their financial performance

- iii. DMBs in Nigeria should continue to focus on maintaining strong liquidity
- iv.

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