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Financial Risk Management and Bank Performance: An Evidence of Selected Nigerian Deposit Money Banks

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Abstract: *The issue of financial risk management has been a burning issue throughout the banking industry in Nigeria especially in the wake of global financial crisis and the ensuing regulatory changes. Nigerian deposit money banks (NDMBs) face a number of financial risks which can impact their capacity to earn sustainable returns and financial sustainability to a large extent. It is thus necessary to understand the impact of these risks on financial performance in a bid to supervise banks and make managerial decisions in Nigeria. The paper explores the effect of financial risk on financial performance in NDMBs on an expo facto research design. The data were collected using secondary sources in the years between 2010 and 2022 and on selected NDMBs. The study utilised stratified sampling to identify the diversity of the NDMBs as 20 banks were purposively identified to participate in the study. The year 2010 was taken as the base year due to the fact that it was the year when the world came out of a global economic crisis and new risk and governance policies were implemented by the bank management and regulators. The information regarding the financial and bank performance was obtained through the Central Bank of Nigeria (CBN) reports and Annual Financial reports of the chosen banks. The data obtained was analysed with the help of proper descriptive and panel least square regression analysis methods. The results exhibited credit risks (CRR), cost-income ratio (CIR), total regulatory capital (TRC), and bank size (SIZE) as factors influencing financial performance through both return on assets (ROA) and return on equity (ROE). CRR showed a negative coefficient value of 0.0002 and probability of 0.0419, LQR has a negative coefficient value of 0.0594 which is statistically significant (p-value = 0.0498), CIR (coefficient = -0.0281 and probability = 0.0106), TRC with a positive coefficient value of 0.0358 on the level of ROA which is statistically significant (p-value = 0.0457), and SIZE showed a coefficient value of 0.0088 which is statistically significant (p-value = 0.0210). While CRR negatively and significantly influenced ROE with a negative coefficient value of 0.0039 and probability of 0.0254, LQR had a positive coefficient value of 0.0867 on ROE which is statistically significant (p-value = 0.0317), CIR (coefficient = 0.0785 and probability = 0.0472), SIZE is significantly influenced the returns with coefficient value of 0.097 and probability of 0.0016. The*

study concludes that financial risk management significantly influences financial performance of NDMBs. The study recommends that banks must observe strict compliance with regulatory positions on lending and ensure that their credit risk management is tailored towards generating sufficient earnings that will improve financial performance. Also, bank management must endeavor to have a robust risk management strategy that incorporates global best practices so as to improve their financial performance and be better prepared for economic challenges.

Keywords*:* financial risk management, financial performance, Nigerian deposit money banks

INTRODUCTION

Over past two decades, the world has witnessed a remarkably severe financial crisis that had far-reaching consequences across sectors globally. A number of sectors were affected by the crisis with the financial services sector, particularly banking, experiencing the most profound impact. Not only did this sector witnessed the abrupt demise of highly reputable institutions, but it also became a frequent target for increased regulatory measures and public discontent. Financial risk, encompassing unforeseen fluctuations or volatility in returns, played a pivotal role in the crisis. This risk comprises elements such as credit risk, market risks, among other, which collectively contribute to instability in performance. Thus, every business decision and endeavor inherently involves risk, organizations exposed to financial markets face the potential for both losses and opportunities for gains or profits (Aniefor & Amahalu, 2022). Effective financial risk management is essential to a bank's financial performance and long-term viability because it can impact substantially on a bank's profitability, solvency and capacity to continue operations (Muriithi & Muigai, 2017). Unresolved concerns about DMBs financial performance in Nigeria add to the complexity of the problem. Clementina and Isu (2016) list low profitability, concerns about sustainability, inability to turn earnings for the owners, and poor payback on investments due to unproductive utilization of available resources as some of these barriers. Financial risk management is particularly difficult for DMBs, in contrast to other difficulties they encounter. According to Olalere and Omar (2016), the asymmetry and systemic characteristics of financial risk have a detrimental impact on banks' non-financial and financial performance. This conduct causes damage to financial standing and undermines the confidence depositors and investors. Reports have also highlighted that banks, particularly those internationally categorized, face significant levels of mismanagement of financial risk that lead to declines in financial performance (CBN, 2020 Report).

Therefore, financial risk management practice emerges as an indispensable skill for modern financial institutions, as evidenced by the expectation that proficient financial risk managers tend to achieve better performance (Abubakar, Garba & Sulaiman, 2020). The concept: financial risk management involves the identification of potential threats or disruptive factors, the critical assessment of available alternatives to either eliminate or mitigate these threats, and the facilitation of organizational understanding regarding the diverse risks confronting contemporary businesses (Adenle, Abidoye, Adeoye, Olu-Akinola, Ojeleye & Onibonokuta, 2025). The advancement of a nation is significantly intertwined with the pivotal role played by banks in its economic landscape.

The Central Bank of Nigeria (CBN) introduced liquidity risk measures to guarantee enough liquidity among these banks after realizing the negative effects of insufficient oversight of monetary danger elements in the operation of the banks. These measures mandated that the banks maintain a cash reserve ratio of 22.5% and a liquidity ratio of 30% (CBN, 2016). Despite these efforts, NDMBs continued to face challenges associated with poor financial risk management, resulting in declines in returns on shareholders' investment, returns on bank assets, and market share (CBN Quarterly Report, 2020). This gives room for further and more current enquiries to explore how dynamic interaction of components

of financial risk management impact on banks' performance. The CBN (2020) emphasizes the importance of this subgroup by pointing out that they manage a sizeable percentage of banking operations, have sizeable capital bases, and are accountable for as much as 70% of the problems related to monetary negligence in the Nigerian financial sector. The relationship between risk management practices and financial performance is complex and multifaceted. Meanwhile, theoretical frameworks suggest that effective risk management should enhance financial performance by reducing losses and improving stability. Empirical evidence from Nigerian banks presents a mixed picture, some studies indicate that banks with advanced risk management systems achieve better financial outcomes, others show negligible impacts (Okpala, Osanebi & Ademola, 2019). This inconsistency highlights the need for more current examination of how different risk management practices influence various performance metrics. This research investigates how financial risk management affect financial performance measures of NDMBs in the light of gaps and issues that have been identified.

REVIEW OF RELATED LITERATURE

Jonathan and Michael (2018) with a focus on the years 2010 to 2016 and using the Fidelity Banks as a case study, examined the interaction of the bank's performance and its risk management strategies. Using a descriptive analysis approach, result of the study showed no significant association between risk indicators and performance. Their analysis also showed an inverse association with both ROE and ROA while the link between profitability and non-performing loans came out negative. Dauda and Nyor in 2018 motivated by the important roles that financial institutions play in economies carried out an investigation how the value of shareholders in NDMBs is affected by financial risk. Panel multiple regression approaches and Generalized Least Square (GLS) estimators were used during these periods of studies (2004 - 2016), which included a sample of nine banks. The findings indicated that, as measured by market capitalization, non-performing loans and loan loss provisions significantly reduced the value held by shareholders. The results of the studies also demonstrated that size significantly increases shareholders' value. The studies however revealed a discrepancy between size and the capital adequacy ratio, indicating that the former had a negative impact on shareholders' value. The researchers suggested that DMBs in Nigeria must curtail their lending and restructure their credit products. The study also emphasized need for Management to develop robust credit policies, operational effectiveness as well as curtail lending that could lead to losses.

Abubakar, Ado, Mohammed, and Mustapha (2018) studied how the financial performance of Nigerian listed banks is affected by information from the finance board and financial risk management. The study's sampled fourteen (14) NSE listed banks over a three-year period (2014-2016). The researchers employed a random effects model using secondary data. Their findings demonstrated that although the risk management committee's size had a minor but positive effect on ROA, the committee's independence and the board's financial knowledge significantly decreased ROA. Related studies suggested also that having more independent directors and people with financial experience on boards would improve bank performance (Abubakar *et al*., 2018; Success, Musa & Ibrahim, 2024; Khalid, Hassan, Ibrahim, Abdalla, Ahmed & Sarea, 2021; Mudanya, 2009; Lu & Wang). Studies also considered the impact of financial risk management on the profitability of quoted deposit money banks in the Nigerian capital market. Panel regression analysis was used on panel data that covered listed banks in Nigeria between 2006 and 2018. Loan-to- deposit ratio, total leverage and NPLR were used as independent variables while ROA represented the response variable. The empirical findings showed a strong correlation between bank performance and credit management. More specifically, the loan-to-deposit ratio displayed a direct positive link with profitability, but the non-performing loan ratio showed an indirect relationship. On the other hand, bank performance was not significantly impacted by bank leverage. In order to improve overall bank performance, some of the studies suggested that bank credit allocation emphasize self-liquidating projects and be effectively supervised and regulated (Ernest &

Fredrick, 2017; Gadzo *et al.*, 2019; Erhabor & Ofiafoh, 2020; Hidayat, Malik, Siregar & Munawaroh, 2021; Omorokunwa & Ogbeide, 2020).

Alduneibat, (2023) examined the effect of Risk Management Committee (RMC) traits on business performance in emerging economies. With a particular focus on Jordan, the research employed a sample consisting of 190 non-financial firms (NFCs) that were listed on the Amman Stock Exchange (ASE) between 2018 and 2021. The study analyzed data using regression and descriptive statistics. The connection between RMC traits like firm size, competency, independence, non-executive composition, meeting frequency were considered alongside return on assets (ROA) that measured business performance. Leverage and firm size were controlled for in the analysis. Data and other information for this study were culled from the website of The Securities Depository Center (SDC). The results showed that every RMC attribute that was looked at had a positive correlation with ROA, with the exception of meetings frequency. Though not statistically significant, the link with meeting frequency was unfavorable. Furthermore, a negative link between leverage and performance was revealed by the regression analysis. Interestingly, there was no proof that RMC and firm size were significantly correlated. The present research enhances the comprehension of RMC dynamics in Jordan and by extendion some other emerging economies and provides significant suggestions for policy making by regulatory bodies, company boards, and legislators in molding the risk governance structure firms. Results and recommendations from the study also corroborated the findings of Sathyamoorthi, Mapharing, Mphoeng and Dzimiri, (2020); and Sutrisno, 2022 on similar study conducted in emerging economies.

In related studies where panel regression analysis was adopted, results showed that risk management procedures financial performance of DMBs were positively correlated. The studies suggested that Nigerian banks improve their proficiency in credit analysis, loan administration, and liquidity risk assessment. Regulatory agencies were also advised to concentrate on making sure banks follow the guidelines provided in the Bank and other Financial Institutions prudential standards (Okere, Akindele & Isiaka, 2018; Sani, Latif & Al-dhamari, 2018).

The growing corpus of research using variety of approaches to investigate the effects of financial risk on the performance of deposit money banks in Nigeria and other nations have been well highlighted by the empirical literatures presented above. The conclusions from those studies differ on many fronts. For instance, in considering how CAR and NPLR affect financial performance; while Dauda and Nyor (2018) relied on market-value data for the same objective, (Epetimehin & Obafemi, 2015; Abubakar, Sulaiman, Usman & Mijinyawa, 2018), choose to use book value data to reflect shareholders' worth. The disparities in the results seen in their individual investigations may be explained by the differences in the proxies and performance metrics selected. These studies, through the use of econometric models, time-series data, and panel data analysis, provide insights into the multifaceted nature of the relationships between various dimensions of financial risk indicators and risk management practices on firm performance. These empirical findings set the cornerstone for subsequent studies to build upon and gain more insight on the risk dynamics that affect the performance of deposit money banks in Nigeria.

THEORETICAL FRAMEWORK

The modern portfolio theory (MPT) was used as underpinning of the study. The fundamental idea behind MPT is the understanding that risk is a necessary component of greater potential gain. According to the idea, there is a range of optimal portfolios known as the "efficient frontier," which together provide the best expected return possible for a given amount of risk. Harry Markowitz in 1952 established the MPT in his paper titled Portfolio selection. MPT speaks of a thorough appraisal and

effective management of risk while also considering expected returns which in the context of this study is the financial performance of the banks. It emphasizes the importance of evaluating returns from investment choices on an aggregate basis while also considering the financial risks implications on the outcome of the management choices (Beyhaghi & Hawley, 2013). The MPT remains relevant to modern investment decision and can add great value to strategic decision-making of DMBs. By embracing MPT, this study aims to contribute valuable insights to the ongoing discourse on risk mitigation and performance optimization.

METHODOLOGY

The study adopted *expo facto* research design. Secondary data were gathered from selected DMBs in Nigeria between 2010 and 2022. Stratified sampling was adopted to recognize the diversity of the DMBs while 20 banks were purposively selected for the study. Year 2010 was chosen as base year because it marked the end of a global financial crisis and the introduction of new risk and governance measures by bank management and regulators. Data on financial and bank performance were sourced from the CBN reports and the Annual Financial reports of the selected banks. The extracted data ranges from return on asset, return on equity, credit risk, market risk, liquidity risk, capital adequacy ratio, total regulatory capital, cost-income ratio, bank leverage, bank size and bank age. Data collected were analysed using appropriate descriptive and inferential statistics suitable for a panel data analysis.

Model Specification

Effect of Financial Risk on Financial Performance

The model was adapted from the work of Akong'a (2014). The linear model being an extension and modification of previous research models expressed in its econometric form would guide the analysis of the effect of financial risk on financial performance:

$$ROA_{it} = \delta_0 + \beta_1 CRR_{it} + \beta_2 MKR_{it} + \beta_3 LQR_{it} + \beta_4 CAR_{it} + \beta_5 TRC_{it} + \beta_6 CIR_{it} + \beta_7 LEV + \beta_8 SIZE + \beta_9 AGE + \mu_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 CRR_{it} + \beta_2 MKR_{it} + \beta_3 LQR_{it} + \beta_4 CAR_{it} + \beta_5 TRC_{it} + \beta_6 CIR_{it} + \beta_7 LEV + \beta_8 SIZE + \beta_9 AGE + \mu_{it}$$

Where β_0 and δ_0 are the constant terms, β_1.....β_9 are the coefficients of the stated variables and μ_{it} represents the error term. ROA and ROE represent measures of Financial Performance, Financial risk variables and control variables are as defined in Table 1.

Table 1: Variables and Measurement

Variables	Description and Measurement	Source
Return on Equity (ROE)	The ratio of net income to shareholders' equity.Net Profit after Interest and Tax / Total Equity	Choiriyah, Fatimah, Agustina & Ulfa, 2021; Oladejo & Okedun, 2026
Return on Asset (ROA)	The proportion of net profit to total assets.Net Profit before Interest and Tax / Total Assets	Odogu, 2024; Oladejo & Okedun, 2026
Capital Adequacy Ratio (CAR)	CAR = (Tier 1 Capital + Tier 2 Capital) / Risk-Weighted Assets	Gadzo, Kportorgbi & Gatsi, 2019
Total Regulatory Capital (TRC).	Total Regulatory Capital = Tier 1 Capital + Tier 2 Capital	Jegede, Soyebo, Fakunmoju & OkunbanJjo, 2021
Cost-Income Ratio (CIR)	Cost-Income Ratio = (Operating Expenses / Operating Income) * 100%	Olalere & Omar, 2016
Credit Risk (CRR)	Bad & Doubtful loan Provisions / Total Loans X 100	Gadzo, Kportorgbi & Gatsi, 2019
Market Risk (MKR)	VARx = Vx (dv/dp) ΔPt dv/dP= price movement per Naira market value.Vx= Market Value of Portfolio x VAR = the Value-at-Risk	Al-Janabi, 2021
Liquidity Risk	Short-Term Security / Total Deposit	Yahaya, Mahat, Yahya & Matemilola, 2022
Leverage	The ratio of total debt to total assets	Oladejo & Okedun, 2025; Muritala & Arowolo, 2025
Size	The natural logarithms of total assets	Aryal & Singh, 2024; Oladejo & Okedun, 2025
Bank Age	The banks total age from the year of establishment	Aryal & Singh, 2024

Researchers compilation, 2025

Pre-estimation Test Results

Descriptive Analysis

In table 2, the CRR had a mean of 13.339 and median of 13.838 which depict the average value for the banks' credit risks. These average values represent the extent of the financial risk specifically through credit risk to be between 13% and 14% over the study period. The minimum value of CRR is 3.070 and the maximum value is 20.041. This indicates that some banks have low credit risks achieved through reduced defaulting customers. Also, banks with maximum value of credit risks indicate a high rate of customers default in the payment of their debt. The standard deviation of the distribution of 4.484 indicates fair variability in the credit risk distribution. The negative skewness of -0.448 indicates that the distribution is left-skewed with more banks having a lower credit risk ratio than others and the Jarque-Bera value of 15.401 likewise the p-value =0.001 which indicates that banks' credit risks are not normally distributed.

The mean of MKR is 8.328 with a median of 8.298 which represents the average variation in market risk across the banks as shown by the fare standard deviation of 2.091 indicating to what level the banks

moderately experienced variability in market risk. The minimum value of 3.977 indicates that some banks experienced low market risk, and the maximum value of 12.688 indicates that some banks are faced with a moderate market risk. The negative skewness of -0.145 portrays that the distribution is left-skewed with some banks having a lower market risk ratio than others. The Jarque-Bera result of 9.534 and p-value=0.009 indicates that market risk deviates from the normal distribution.

The liquidity risk has a mean of 8.618 with a median of 8.541 which is slightly higher than the median and indicates variability level the banks' liquidity risk. The minimum value of 6.561 connotes some banks experienced a lower liquidity risk with the maximum value of 11.047. The positive skewness of 0.153 suggests that few banks are faced with liquidity risk relative to the liquidity risk of other banks. The Jarque-Bera of 9.534 also a p-value=0.004 suggest that liquidity risk is not normally distributed with 1.187 standard deviation which suggests low variability.

The CAR had a mean of 8.919 with a median of 8.906 which indicates that the capital adequacy ratio across banks is relatively balanced, with the value roughly evenly spread around the center. The minimum value of 6.196 indicates that some banks' capital is insufficient to meet its risk-weighted asset and regulatory requirement close, the maximum value of 11.919 also indicates that some banks will have enough capital on reserve to handle potential losses before being at risk of insolvency and the standard deviation is 1.585 representing a fair variability in capital adequacy ratio. The positive skewness of 0.112 suggests few banks are faced capital adequacy ratio and the Jarque-Bera test of 18.373 and p=0.000, means that the capital adequacy ratio does not follow a normal distribution.

The mean of CIR is 57.237, with a median of 57.068 which means that the efficiency of the banks within the group is on average. The maximum and minimum values of the cost-income ratio are 63.689 and 51.982 respectively which indicate that the efficiency ratio of some banks is high while the minimum value indicates the efficiency ratio of some banks is low compared to other banks. The standard deviation of 2.826 suggests a moderate variability. The positive skewness of 0.090 means that few banks are efficient in their operation, and the kurtosis of 1.800 indicates we have a flatter distribution in the cost-income ratio of banks. The Jarque-Bera test of p = 0.000 shows that it deviates from normal distribution.

The TRC had a mean of 16.829 and a median of 16.753 which indicates that on average, banks in the sample maintain the total regulatory capital required to hold according to regulatory guidelines. The minimum value of 14.143 means that 14% of banks can hold such required capital following the regulatory requirement, the maximum value of 18.546 means that, the maximum percentage of banks able to abide by TRC is 18% and the standard deviation of 1.086 indicates small variability. The kurtosis 1.752 also suggests a flatter distribution and the Jarque-Bera test p = 0.000, indicates that the total regulatory capital avoids normal distribution.

The ROA had a mean of 2.109 and a median of 1.987, which is slightly lower than the mean, which indicates that on average the banks can use their asset to generate profit. The minimum value of 0.421 means that the few banks that can use their asset to generate profit is 0.421 while the maximum value of 3.798 also indicates that the maximum number of banks able to maintain their ROA is 3.789. The standard deviation of 1.004 indicates that the distribution has a wide variability and the positive skewness of 0.052 indicates that the distribution is mild right skew that is many banks can use their asset to generate profit The kurtosis of 1.740 suggests that ROA had a flatter distribution. The Jarque-Bera test of p = 0.000 indicates that the ROA deviates from normal distribution. ROE had a mean of 15.850 with a median of 15.532 with minimal skewness of 0.111. The range is 9.283 to 22.585, and the

standard deviation is 3.971, indicating moderate variability. The kurtosis of 1.791 is near-normal. The Jarque-Bera test had p = 0.000 requiring rejection of null hypothesis of normality.

The mean for LEV is 85.480, and the median is 0.854 which is lower than the mean, with right skewness of 4.517 and a standard deviation of 62.658 this reflects a high variability. The kurtosis of 23.239 reflects an extremely peaked distribution. The Jarque-Bera test reflects a probability value of p = 0.000 which strongly necessitated the rejection of normality hypothesis. The SIZE had a mean value of 20.414, lower than the value of the median which was 20.932, indicating a left skewness of -2.180. The range is 11.961 to 23.751, with a standard deviation of 2.397. The high kurtosis of 7.284 suggests a peaked distribution. The Jarque-Bera test had a p-value of 0.000 indicating no normality. A value of 27.635 represents the mean of AGE, which is higher than the median of 25.500, indicating right skewness of 0.775. The range is wide within the range of 0 to 77, with a standard deviation of 19.673. The kurtosis of 2.838 suggests a slightly peaked distribution and the Jarque-Bera of p = 0.000, therefore the null hypothesis being rejected i.e. no normality.

Table 2: Descriptive Statistics

	CRR	MKR	LQR	CAR	CIR	TRC	ROA	ROE	LEV	SIZE	AGE
Mean	13.339	8.328	8.618	8.919	57.237	16.829	2.109	15.850	85.480	20.414	27.635
Median	13.838	8.298	8.541	8.906	57.068	16.753	1.987	15.532	0.854	20.932	25.500
Maximum	20.041	12.688	11.047	11.919	63.689	18.546	3.798	22.585	94.490	23.751	77.000
Minimum	3.070	3.977	6.561	6.196	51.982	14.143	0.421	9.283	0.000	11.961	0.000
Std. Dev.	4.484	2.091	1.187	1.585	2.826	1.086	1.004	3.971	62.658	2.397	19.673
Skewness	-0.448	-0.145	0.153	0.112	0.090	-0.051	0.052	0.111	4.517	-2.180	0.775
Kurtosis	2.213	2.108	2.041	1.717	1.800	1.752	1.740	1.791	23.239	7.284	2.838
Jarque-Bera	15.401	9.534	10.983	18.373	15.949	16.986	17.317	16.369	71.855	404.771	26.335
Probability	0.001	0.009	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	260	260	260	260	260	260	260	260	260	260	260

Researchers Compilations, 2025

Unit Roots Test

Table 3 provides information about the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests results in the determination of the level at which each variable achieved stationarity.

ROE as shown in the ADF of (t-stat = 85.8051; p = 0.0000) and PP statistic of (t-stat = 148.023; p = 0.0000) necessitated rejection of no stationarity at level hypothesis and accept the alternative that, return on equity achieved stationarity at the level. The variable Return on Asset had a statistic (t-stat = 106.845; p = 0.0000) and (t-stat = 197.901; p = 0.0000) for the ADF and PP respectively. This prompted the decision that ROA achieved stationarity at the level. With an ADF statistic of (t-stat = 92.877; p = 0.000) and PP statistic of (t-stat = 124.881; p = 0.000) Leverage as another variable in consideration achieved stationarity at level therefore, the null hypothesis of no stationarity at level was rejected.

The firm size reflects an ADF statistic of (t-stat = 52.3227; p = 0.0417) and a PP statistic of (t-stat = 229.407; p = 0.000). The ADF and the PP provide evidence that the firm size achieved stationarity at the level. Credit Risks (CRR) had a statistic of (t-stat = 90.0654; p = 0.0000) and (t-stat = 158.949; p = 0.0000) respectively for ADF and PP. This implies that Credit Risk (CRR) achieved stationarity at level.

The Market Risk (MKR) which is another variable in consideration, achieved stationarity at a level with ADF statistic of (t-stat = 109.597; p = 0.0019) and PP statistic of (t-stat = 222.020; p = 0.0000). Also, Liquidity Risk (LQR) had a statistic of (t-stat = 52.043; p = 0.000) for the ADF and (t-stat = 57.519; p = 0.000) for the PP indicated that LQR achieved stationarity at level. A statistic of (t-stat = 57.0852; p = 0.0389) for the ADF and (t-stat = 149.349; p = 0.0000) for PP, attributable to Capital Adequacy Ratio (CAR) reflects that stationarity was achieved at level, therefore the alternative hypothesis was accepted. The Cost-Income Ratio (CIR) had a statistic of (t-stat = 101.955; p = 0.0000) and (t-stat = 197.086; p = 0.0000) for ADF and PP respectively, confirming that CAR achieved stationarity at the level.

Total Regulatory Capital (TRC) yet another variable, achieved stationarity at level, given a statistic of (t-stat = 79.7251; p = 0.0002) for ADF and (t-stat = 209.059; p = 0.0000) for PP. Therefore, all the variables achieved stationarity at the level given in the result presented in table 3 below.

Table 3: Unit Root Test Results

Variables	ADF			PP		
	t-stat	Prob	Los	t-stat	Prob	Los
ROE	85.8051	0.0000**	I(0)	148.023	0.0000**	I(0)
ROA	106.845	0.0000**	I(0)	197.901	0.0000**	I(0)
LEV	92.8770	0.0000**	I(0)	124.881	0.0000**	I(0)
SIZE	52.3227	0.0417**	I(0)	229.407	0.0000**	I(0)
CRR	90.0654	0.0000**	I(0)	158.949	0.0000**	I(0)
MKR	109.597	0.0019**	I(0)	222.020	0.0000**	I(0)
LQR	87.7609	0.0000**	I(0)	177.082	0.0000**	I(0)
CAR	57.0852	0.0389**	I(0)	149.349	0.0000**	I(0)
CIR	101.955	0.0000**	I(0)	197.086	0.0000**	I(0)
TRC	79.7251	0.0002**	I(0)	209.059	0.0000**	I(0)

Source: Researchers Computation, 2025
*Note: ** means 5% Level of Significant*

Pairwise Correlation Matrix

The correlation matrix shows several relationships between financial risks and their potential determinants in Table 4. There exists a positive relation among credit risk, MKR, LQR and CAR with coefficient of 0.0106, 0.1231, and 0.0197 respectively with little significance in all values. Also, Credit risk had a negative relation with the Cost-income ratio, Total regulatory capital and Leverage with coefficients of -0.0451, -0.0323 and -0.0985. There exists a positive and little significant correlation of 0.1740 and 0.0619 denoting that an increase in credit risk led to an increase in size and age. Market Risk (MKR) shows no significant but negative correlation with Liquidity risk, CAR, CIR, Size and Age, with coefficients of -0.0208, -0.0976, -0.0127, -0.1124, and -0.0470 respectively. Also, MKR have

a positive correlation with Total Regulatory Capital and Leverage with their respective coefficient being 0.0021 and 0.1069.

Liquidity Risk (LQR) with a correlation of -0.0857 and -0.0112 respectively for TRC and LEV; indicating that high liquidity risk exposure tends to bring about lower leverage as well as a decrease in total regulatory capital required. Likewise, LQR has positive relations with CAR, CIR, SIZE, and AGE with their corresponding coefficients being 0.0237, 0.0459, 0.0018, and 0.0471. The Capital Adequacy Ratio also shows a weak positive correlation amongst TRC, SIZE, and AGE with correlation coefficients of 0.1284, 0.1010 and 0.0241 respectively and negative relations among CIR and LEV with the correlation coefficient of -0.0206 and -0.0638 respectively. The cost-Income Ratio (CIR) shows a weak positive correlation with TRC, SIZE and AGE with coefficients of 0.0914, 0.0138, and 0.0006 respectively. This shows that CIR, TRC, SIZE and AGE hardly affect each other. There is a negative correlation between CIR and LEV with a coefficient of -0.0435. This implies an inverse relationship in the sense that as CIR increases, LEV decreases by 0.0435.

Total Regulatory Capital (TRC) shows a negative correlation with LEV and AGE where their corresponding coefficient are -0.0916 and -0.0369. Also, the TRC shows a positive correlation with SIZE whose coefficient is 0.0749 indicating that TRC brings about an increase in size. Leverage (LEV) shows a significant negative correlation with SIZE and AGE with coefficients of -0.4412 and -0.2101 individually. This relationship suggests that liquidity has a significant impact on Size as well as Age. The Size (SIZE) and AGE have a significant correlation with a 0.2396 coefficient. The pairwise correlations as presented in Table 4 show that none of the pairwise correlations indicate a strong correlation coefficient except for the Leverage relation with SIZE and AGE which have a strong correlation with a coefficient of -0.4412 and -0.2101 and Size relation with Age given the coefficient of 0.2396.

Therefore, the result of Correlation Matrix presented in Table 4 further confirms that; for testing and analyzing financial risk management and financial performance of selected DMBs in Nigeria, the specified model will apply without any adjustment to the model.

Table 4: Pairwise Correlation Matrix Results

Correlation Probability	CRR	MKR	LQR	CAR	CIR	TRC	LEV	SIZE	AGE
CRR	1.000000								

MKR	0.010570	1.000000							
	0.8653	-----							
LQR	0.123118	-0.020807	1.000000						
	0.0473	0.7384	-----						
CAR	0.019710	-0.097545	0.023730	1.000000					
	0.7518	0.1166	0.7033	-----					
CIR	-0.045079	-0.012657	0.045870	-0.020644	1.000000				
	0.4692	0.8390	0.4615	0.7404	-----				
TRC	-0.032275	0.002050	-0.085728	0.128360	0.091346	1.000000			
	0.6044	0.9738	0.1681	0.0386	0.1419	-----			
LEV	-0.098452	0.106866	-0.011221	-0.063752	-0.043477	-0.091569	1.000000		
	0.1133	0.0855	0.8571	0.3058	0.4852	0.1409	-----		
SIZE	0.174041	-0.112364	0.001794	0.101039	0.013796	0.074932	-0.441145	1.000000	
	0.0049	0.0705	0.9770	0.1041	0.8248	0.2285	0.0000	-----	
AGE	0.061882	-0.047008	0.047123	0.024130	0.000619	-0.036846	-0.210109	0.239552	1.000000
	0.3202	0.4504	0.4493	0.6986	0.9921	0.5542	0.0007	0.0001	-----

Researchers Compilations, 2025

Redundancy Fixed Test and Hausman Test Results

To ascertain the appropriate regression method to use among, the Redundant Fixed Effect Test and Hausman Test were estimated, a single linear model was formed to examine the determinants of financial risks within the Nigerian banking sector. These financial risk measures include; CRR, MKR, LQR, CAR, CIR, and TRC as showed in Table 5.

The redundant fixed effect test for CRR had a statistic of (t-stat = 49.6598; p = 0.0001), which necessitated adopting the alternative at a 5% level of significance, hence the fixed effect model. This further required the Hausman test fully ascertain appropriateness of the model. The statistic for the Hausman test for CRR showed (t-stat =3.3805; p = 0.6415) as a result, null hypothesis was accepted and the Random Effect Model is adopted as the appropriate model for credit risk. The Market Risk (MKR) redundant fixed effect test had a statistic of (t-stat = 23.2945; p = 0.2246) which implies that the null hypothesis being the Pooled Effect Model is accepted as appropriate for MKR model. With a statistic of (t-stat = 20.7858; p = 0.3488) Liquidity Risk (LQR) adopted the Pooled Effect Model.

The Capital Adequacy Ratio (CAR) with a statistic of (t-stat = 14.8884; p = 0.7297) adopted the Pooled Effect Model as appropriate model given the value of the redundant fixed effect test estimate. Pooled Effect model was equally adopted for CIR and TRC with test of statistic (t-stat = 25.6422; p = 0.1405) and (t-stat = 19.7393; p = 0.4104) respectively following the redundant fixed effect test. Therefore, the

appropriate model for each of the determinants of financial risk includes; the Random Effect Model for CRR, and the Pooled Effect Model for the remaining variables.

In an attempt to analyse the Effect of Financial Risk Management on the Financial Performance of Selected DMBs in Nigeria, the variables ROA and ROE were considered as the determinants of this study. The redundant fixed effect test of the return on asset had a statistic of (t-stat = 14.9771; p = 0.7241) which necessitated the acceptance of the Pooled Effect Model as the appropriate for return on asset. The statistic of (t-stat = 21.5127; p = 0.3092) for the redundant fixed effect test of return on equity, made the Pooled Effect Model to be the appropriate model likewise. The alternative hypothesis of the objective was rejected in the two variables given their values, making the Pooled Effect Model the appropriate model for the analysis

Table 5: Regression Output of the Financial Risks Determinants

MODEL	Random			Pooled			Pooled			Pooled			Pooled			Pooled		
Dependent / Independent Variable	CRR			MKR			LQR			CAR			CIR			TRC		
	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.
ROA	-0.073	-1.474	0.098	0.041	2.311	0.019	-0.092	-2.540	0.036	0.061	1.925	0.079	-0.228	-1.984	0.047	0.048	0.707	0.481
ROE	-0.001	-0.007	0.995	-0.018	-1.868	0.078	0.012	2.573	0.035	-0.015	-1.978	0.048	0.035	1.978	0.047	-0.031	-1.847	0.066
LEV	0.002	1.947	0.058	0.000	2.042	0.049	-3.970	-0.130	0.897	9.760	0.240	0.811	-0.001	-1.970	0.050	-0.000	-2.271	0.046
SIZE	0.437	2.417	0.016	-0.06	-0.736	0.462	-0.011	-0.246	0.806	0.079	2.679	0.023	-0.047	-0.424	0.672	0.014	0.334	0.739
AGE	0.007	0.321	0.749	-0.002	-0.289	0.773	0.003	2.024	0.050	0.000	0.034	0.973	-0.001	-0.123	0.902	-0.003	-2.410	0.037
R-Squared	0.284959			0.455778			0.509873			0.503249			0.381490			0.526817		
Redundancy / Hausman	t-stat		Prob.	t-stat		Prob	t-stat		Prob	t-stat		Prob	t-stat		Prob	t-stat		Prob
	3.380510		0.6415	23.2945		0.2246	20.785812		0.3488	14.888391		0.7297	25.642185		0.1405	19.739328		0.4104

Researchers Compilations, 2025
5% Level of Significance

Regression Analysis Results

The table 6 analyzed the effect of financial risks on the financial performance of banks in Nigeria. The results indicate that the influencing factors of financial performance through return on assets (ROA) include credit risks (CRR), liquidity risk (LQR), cost income ratios (CIR), total regulatory capital (TRC) and the size of the banks. The credit risks (CRR) with statistics of (t-stat = -1.9972; $p < 0.05$), liquidity risks of the banks with statistics of (t-stat = -1.9612; $p < 0.05$) and the cost-income ratios with statistics of (t-stat = -2.2550; $p < 0.05$) all showed significant negative effect on the level of return on assets The total regulatory capital however shows a statistic of (t-stat = 1.9730; $p < 0.05$) indicating a positive

and significant influence on the level of return on assets (ROA). These results on the influence of financial risks on the level of financial performance show that most of the financial risk measures with significant influence on the level of return on assets indicate a negative effect except for the total regulatory capital with a positive influence. Also, the size of the banks is found to have a significant positive effect on the return on assets with statistics of (t-stat = 2.2214; $p < 0.05$). The R square of the model is 0.6224 indicating that approximately 62% of variations in the dependent variable (ROA) can be explained by the independent variables.

The study also adopted return on equity to determine the robustness of the influence of financial risks on the level of financial performance of banks in Nigeria. The significant influencing factors of return on equity (ROE) include credit risks (CRR), liquidity risks (LQR), cost-income ratios (CIR) and size of the banks. The credit risks of the banks negatively and significantly influence the return on equity with a statistic of (t-stat = -2.0686; $p < 0.05$). The liquidity risks (LQR) have a positive and significant influence on the return on equity (ROE) with a statistic of (t-stat = 2.4079; $p < 0.05$). The cost-income ratios had a significant negative influence on the return on equity with statistics of (t-stat = 1.9847; $p < 0.05$). This result provides evidence of the influence of financial risks on the level of financial performance of the banks. Also, the size of the banks significantly influences the returns with statistics of (t-stat = 3.5665; $p < 0.05$). The model also showed a substantial R square at 0.5201 indicating that approximately 52% of variations in the ROE are explained by the explanatory variables.

Table 6: Regression Analysis Results

MODEL	Pooled			Pooled		
Dependent/Independent Variable	ROA			ROE		
	Coeff.	t. stat	Prob.	Coeff.	t. stat	Prob.
CRR	-0.0002	-1.9972	0.0419	-0.0039	-2.0686	0.0254
MKR	0.0094	0.3084	0.7580	-0.0657	-0.5459	0.5856
LQR	-0.0594	-1.9612	0.0498	0.0867	2.4079	0.0137
CAR	0.0221	0.5481	0.5841	-0.0620	-0.3884	0.6981
CIR	-0.0281	-2.2550	0.0106	0.0785	1.9847	0.0472
TRC	0.0358	1.9730	0.0457	-0.4183	-1.7857	0.0754
LEV	0.0003	1.0069	0.3149	0.0004	0.3870	0.6991
SIZE	0.0088	2.2214	0.0210	0.0897	3.5665	0.0016
AGE	-0.0007	-0.2241	0.8229	0.0019	0.1423	0.8869
R-Squared	0.622440			0.520136		
Redundant/ Hausman.		14.977100	0.7241		21.512660	0.3092

Researchers Compilations, 2025
5% Level of Significance

DISCUSSION OF FINDINGS

The key influencing factors of financial risks include the financial performance measures together with specific banks' characteristics such as leverage (LEV), size of the banks (SIZE) and age of the banks (AGE). The bank size having a significant positive effect on the level of credit risks of banks denotes the fact that larger banks take more risk towards lending to their customers possibly for profitability purposes and the possibility of receiving support from the apex bank or government support to avert any financial problems arising from debt defaults of the customers. The results are consistent with that of Aryal & Singh (2024) who found that the size of the banks together with their return on assets increases the exposure of the banks in Nepal credit defaults and credit risk. The regression results of return on assets and the leverage of the banks on the market risks represent the fact that banks that are highly profitable and being increasingly leveraged will most likely be exposed to increased market volatility representing the increased level of risks for the banks. This is in line with the study of Bohachova (2008) who holds the view that banks operating in a high-growth environment experienced increased market distortions, especially during the period of economic downturns. The return on assets (ROA) having negative effects on the liquidity risks of banks goes with the fact that banks with less profitability might be exposed to an increased tendency of liquidity risks going in contrary, the return on equity (ROE) and the age of the banks (AGE) having positive effects on the level of liquidity risks denotes the fact that larger banks especially those with increased profitability and older in the bank industry might have higher liquidity pressures (Abdilahi & Davis, 2022). The capital adequacy ratio (CAR) shows that return on equity (ROE) negatively influences CAR and bank size has a positive influence. This suggests that more profitable banks may have less capital, possibly due to dividend payout or riskier asset allocation. Bohachova (2008) also found that the capital adequacy ratio tends to be pro-cyclical and decreases during economic growth when banks are more profitable, which is consistent with the findings of this study. The return on assets (ROA) and leverage (LEV) has a negative influence while ROE has a positive influence on the cost income ratios (CIR). This suggests that banks with low profitability manage their costs well and that a high return on equity (ROE) may lead to increase financial risks. This is consistent with Owira, (2011) study on savings and credit unions in Kenya, which found that poor and underperforming performance is associated with high financial risk (Owira, 2011).

The results regarding the influence of financial risks on the level of financial performance of banks depict key information. The credit risks having a significant negative effect on the ROA and ROE indicate the fact that increased customer loan defaults will naturally deteriorate the banks' financial performance and this is consistent with the study by (Inegbedion, Vincent & Obadiaru, 2020). Liquidity risk (LQR) has a dual effect by negatively affecting return on assets (ROA) and positively affecting return on equity (ROE). This difference may indicate short-term liquidity pressure that reduces asset efficiency, while strategic use of liquidity improves shareholder returns. Febrianto, Ratnawati and Riyadi, (2022) found similar trends in Indonesian banks where liquidity risk reduces firm value, especially during unstable macroeconomic conditions such as interest rate fluctuations and inflation.
Cost-income ratio (CIR) with a negative relationship on ROA and ROE, indicate that operational inefficiency directly affects profitability. This aligns with by Olamide, Uwalomwa and Ranti, (2015) which reported that inefficient cost structures in Nigerian banks, often exacerbated by inflationary pressures and regulatory constraints, negatively impact financial performance. Total regulatory capital (TRC) has a substantial positive effect on return on assets, suggesting that well-capitalized banks are better positioned to weather shocks and remain profitable. This is supported by 2014 study with hypothesis that capital adequacy improves banks' resilience to shocks, especially in economies like Nigeria with high macroeconomic volatility (Osamwonyi & Michael, 2014). Bank size has a positive effect on returns, indicating that larger banks take better advantage of diversified portfolios and

economies of scale. This finding is corroborated by Olamide *et al.* (2015), who found that larger Nigerian banks tend to perform better due to stronger governance structures and higher market share. The result from this study as pointed in preceding paragraphs give credence to the Modern Portfolio Theory with the underlying idea that risk is a necessary component of greater financial gains and financial risk must be effectively managed to earn commensurable financial performance. Findings from the study equally invalidates the null hypothesis (H0) that financial risk had no effect on financial performance of deposit money banks in Nigeria. In fact; credit risk, liquidity risk and cost income ratio demonstrated significant influence on financial performance as measured by ROA and ROE.

CONCLUSION AND RECOMMENDATIONS

The study concludes that banks could achieve higher returns by skillfully managing risker loan portfolios leveraging the risk return trade-off. However, the study also emphasized the importance of continuously monitoring credit risk to prevent long term financial instability, as supported by Musa and Danjuma (2022). Likewise, it found that liquidity risk positively impacts profitability, highlighting the need to maintain adequate liquidity to meet short term obligation and ensure operational efficiency. Conversely, a negative trend is posed by market risk to profitability as a rise in exposure to market volatility lead to reduced ROE. The findings show that inherent risk attributed with external market conditions and the need for banks to adopt a more robust market risk management practice when market risk is effectively managed, it can help reduce the adverse effects of financial shocks and economic fluctuations, allowing banks to balance their earnings even in volatile environments. This aligns with the work done by Ikenna and Ugochukwu (2021), who emphasized the negative impact of market risk on financial performance in unstable markets. This finding also attested to some previous assertions and recommendations that banks must maintain a good balance of long-term financial stability through sufficient capital base and making secure investment choices.

It is recommended that banks must observe strict compliance with regulatory positions on lending and ensure that their credit risk management is tailored towards generating sufficient earnings that will improve financial performance. While efforts were made to examine the effect of financial risk on financial performance, other known indicators such as; Equity to Debt Ratio (EDR), Advances to Asset Ratio (AAR) and Non-Performing Loan to Total Asset (NPL-TA) could not be considered owing to constrain of time and data availability.

As such, the findings may not account for all possible significant variables. Additionally, the study focused on financial risk as factors that impact bank performance while ignoring key macro-economic factors which from time to time play key roles in shaping the profitability of NDMBs. It is imperative for more research to be conducted on how advancements like artificial intelligence and machine learning can improve risk management processes in banks. Valuable insights can be derived by looking at how digital tools can enhance risk assessment and mitigation in modern banking operations. Examine how banks in other African countries manage their financial risks could enlighten one on the differences in practices across different economic and regulatory environments. Studies like this one will help in identifying the best practices banks in Nigeria could adopt to improve their financial performance in an increasingly globalized banking sector.

Abbreviations

NDMBs:	Deposit Money Banks
ROA:	Return on Assets
ROE:	Return on Equity

LEV:	Leverage
TRC:	Total Regulatory Capital
CIR:	Cost Income Ratios
SIZE:	Bank Size
AGE:	Bank Age
CRR:	Credit Risk
MKR:	Market Risk
LQR:	Liquidity Risk
CAR:	Capital Adequacy Ratios
EDR:	Equity to Debt Ratio
AAR:	Advances to Asset Ratio
NPL-TA:	Non-performing Loan to Total Asset

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