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FINANCIAL RISK MANAGEMENT AND FINANCIAL PERFORMANCE OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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ABSTRACT

This study evaluated the effect of financial risk management on financial performance of listed deposit money banks in Nigeria. Specifically, the study evaluated the effect of credit risk management, liquidity risk management, credit risk management and operational risk management on return on average assets of listed deposit money banks in Nigeria, and finally, evaluate the extent to which firm size moderate the relationship between total financial risk management and returns on average assets of listed deposit money banks in Nigeria. The study adopted an ex-post facto research design. The population of the study was fourteen (14) listed deposits money banks in the Nigerian Exchange Group and nine (9) was used as sample size employing purposive sampling technique. The data used in the study was sourced from annual reports and statement of accounts of the selected firms between 2013 and 2022. The study adopted descriptive statistics, unit root test, diagnostics test, Hausman test and Panel Least Square of multiple regression techniques with the help of Eview 10 and Statistical Package for Social Science (SPSS v 20) for the purpose of Moderated Multiple Regression (MMR) technique. The study result disclosed that the effect of market risk management on return on average assets of listed deposit money banks in Nigeria is not significant, the effect of liquidity risk management on return on average assets of listed deposit money banks in Nigeria is not significant, the effect of credit risk management on return on average assets of listed deposit money banks in Nigeria is significant, the effect of operation risk management on return on average assets of listed deposit money banks in Nigeria is significant, and the moderating effect of firm size on the relationship between total financial risk management and returns on average assets of listed deposit money banks in Nigeria is not significant. Therefore, the study generally concluded that the effect of financial risk management on financial performance of listed deposit money banks in Nigeria is positive and statistically not significant for the period 2013 - 2022. The study recommends amongst others that since increase in market risk management increase financial performance in tern of return on assets of listed deposit money banks, the financial institutions should establish sound market risk committee that would evaluate market investment activities within the firm before investing.

Keyword: Financial risk management, credit risk management, liquidity risk management, operational risk management and return on average assets

INTRODUCTION

Deposit money banks in Nigeria just like other businesses are facing a number of financial risks in their daily operations. There are a number of large scale deposit money banks in Nigeria that have been scaling down there operations due to poor performance. The poor performance has been partly associated financial risks. One of such problem of deposit money banks is the lack of liquidity caused by issuing of loans without studying and respecting the required procedures. The deposits are used to provide credits, the issue unsecured loan and finally the borrowers fail to payback those loans which lead to loss of liquidity, and finally Central banks bankruptcy of the most of them. Bank need to manage the credit management inherent to the entire portfolio as well as the risk of individual credits or transaction (Duniamastaki, 2022). The poor performance of deposit money bank may be determined by some element such as: liquidity risk, systematic risk,

operating risk, credit risk monetary policy issue, economic ramification. But credit risk management may have played a big role in collapsing of many financial institutions. Since a high risk provide a high profitability and a low credit risk took provide a low profitability, this situation lead banks to increase their risk for satisfying their shareholder in this case the commercial bank faces the liquidity crisis as what happened in 2008 deepest recession since the Word war II, it was also the longest, lasting eighteen months. The unemployment rate more than doubled, from less than 5 percent to 10 percent in Nigeria. Yimka et al (2015) stated that credit risk is caused by, low capital and liquidity levels, directed lending, massive licensing of banks, poor loan underwriting, reckless lending, poor credit assessment, no non-executive directors, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank. Other types of risk which are external to a bank may include inflation risk, market risk, exchange rate risk, political risk etc. Adegbie and David (2020) confirmed that many banks had collapsed or experienced serious financial constraints due to their continuous exposure to severe operational loss events and fraudulent actions. According to Khan et al (2023) financial institutions have experienced several large operational loss events in the past years. Also, many banks in Nigeria had experienced financial distress and subsequently liquidated or taken over due to poor or ineffective financial risk management practices and policies. For example, Nigeria Merchant Bank Plc, Metropolitan Bank Limited, Cooperative and Commerce Bank Plc, Group Merchant Bank Limited had failed due to losses suffered from operational events such as weak risk management, noncompliance with credit policies, poor operational policies and procedures in the bank, weak human resources and capacity, weak corporate governance, compromise in information technology, ineffective audit, mismanagement, weak supervisory framework and major regulatory change (NDIC 2017). Also, CBN (2014) explained that the crisis in the banking sector was caused by poor financial risk management practices, absence of basic control measures, near total absence of corporate governance in most of banks, lack of adequate disclosure and transparency about the accurate financial positions of banks, poor operating environment, weak internal control, inside abuse, among others.

Studies have been carried out globally and locally on effect, impact or relationship between financial risk management practices and financial performance of firms, but the studies discovered mix results. Some indicated positive and significant result while others disclosed negative and insignificant effect, impact or relationship. Prior studies that discovered positive or significant effect, impact or relationship includes; Jerono and Olweny (2023), Mária et al (2023), Ishmail et al (2023), Khan et al (2023), Lukman and Surajudeen (2022), Thair and Qais (2022), Shima et al (2022), Yuliia et al (2022), Apochi and Baffa (2022), Salimata et al (2022), Samsul et al (2022), Bassey and Udoh (2022), Falah et al (2022), Salah (2022), Ishaq et al (2021), Ugwu et al., (2021), Halbous (2021), Olajide and Diekolola (2020) etc. On the contrary, Oluwaleye et al (2023), Edwin et al (2023), Ademola and Ismaila (2022), Duniamastaki (2022), Lenka and Jindřich (2022), Chintya et al (2022), Abiodun et al (2021)**,** Abdullahi (2021) discovered negative or insignificant effect or relationship between the dimensions of financial risk manamgnet and financial measures of deposit money banks and other financial institutions with Nigeria and outside Nigeria. This study will seek to test these conflicting findings and fill any possible gaps using financial risk management and financial performance of deposit money banks in Nigeria. To the best of our knowledge, none of the prior studies have adopted market risk management, liquidity risk management, credit risk management and operational risk management as proxies for financial risk management against average return on assets as well as firm size in moderating the role of firm size on the relationship between financial risk management and financial performance of listed deposit money banks in Nigeria at the time of carrying out this study. Hence, there is a research gap that this study intends to fill.

Aim and Objectives of the Study

The ultimate aim of this study was to evaluate the effect of financial risk management on financial performance of listed deposit money banks in Nigeria. Therefore, the specific objectives of this study are to:

1. evaluate the effect of market risk management on return on average assets of listed deposit money banks in Nigeria;
2. ascertain the effect of liquidity risk management on return on average assets of listed deposit money banks in Nigeria;
3. evaluate the effect of credit risk management on return on average assets of listed deposit money banks in Nigeria;
4. evaluate the effect of operation risk management on return on average assets of listed deposit money banks in Nigeria;
5. determine the moderating effect of firm size on the relationship between total financial risk management and returns on average assets of listed deposit money banks in Nigeria;

Research Questions

In line with the objectives of this research work, the following questions were raised:

1. What is the effect of market risk management on return on average assets of listed deposit money banks in Nigeria?
2. What is the effect of liquidity risk management on return on average assets of listed deposit money banks in Nigeria?
3. What is the effect of credit risk management on return on average assets of listed deposit money banks in Nigeria?
4. What is the effect of operation risk management on return on average assets of listed deposit money banks in Nigeria?
5. What is the moderating effect of firm size on the relationship between total financial risk management and returns on average assets of listed deposit money banks in Nigeria?

Hypotheses

From the objectives of the study and the resultant research questions, the following research hypotheses emanated:

H_{01}: The effect of market risk management on return on average assets of listed deposit money banks in Nigeria is not significant;

H_{02}: The effect of liquidity risk management on return on average assets of listed deposit money banks in Nigeria is not significant;

H_{03}: The effect of credit risk management on return on average assets of listed deposit money banks in Nigeria is not significant;

H_{04}: The effect of operation risk management on return on average assets of listed deposit money banks in Nigeria is not significant;

H_{05}: The moderating effect of firm size on the relationship between total financial risk management and returns on average assets of listed deposit money banks in Nigeria is not significant;

REVIEW OF RELATEDLITERATURE

Conceptual Review

Concept of Financial Risk Management

Financial risk management may be described as a systematic technique for analysing, evaluating, and addressing financial risks. Stephen et al (2017) defined financial risk management as a sequence of four (4) processes: (1) the identification of events into one or more broad categories of market, credit, operational and other risks into specific sub-categories; (2) the assessment of risks using data and risk model; (3) the monitoring and reporting of the risk assessments on a

timely basis; and (4) the control of these risks by senior management. Because of the vast diversity in risk that banking institutions take, there is no single risk management guidelines for banking institutions prescribed risk management system that works for all. This increases the possibility that goals will be achieved and ensures that businesses, people, and communities remain sustainable. It also assists the company in keeping track of new customers. A full comprehension of the relevant dangers, an assessment of their relative importance, and a methodical monitoring and control strategy are necessary for risk management to be successful. To lessen or totally prevent the possible loss, it is vital to recognize potential risks, assess and analyze them, and take precautionary action. The objective of financial risk management is to lower risk. Risk management is defined as the identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities Risks can come from uncertainty in financial markets, project failures, legal liabilities, credit risk, accidents, natural causes and disasters as well as deliberate attacks from an adversary (Paulinus & Jones, 2017). Risk management refers to the belief that the likelihood of an event occurring can be reduced or the consequences avoided. Risk management is an important tool to mitigate the negative impact of exposure and to gain the best from risky conditions (Mohammed & Knapkova, 2016). Effective risk management is designed to reasonably ensure that the objectives of business enterprises are achieved while keeping risks associated with business activities at bay. Effective risk management regularly evaluates and detects risks, reducing surprises affecting the organization negatively. Risk management that encompasses the whole activities of business organizations is enterprise risk management.

Market Risk Management: Market risk is the risk that a firm will incur losses because of a change in the price of assets held resulting from changes in interest rate, securities, commodity prices, foreign exchange rate and other market risk factors. Ekinci (2016) upholds that market risk is the risk of losses in liquid portfolio arising from the movements in market prices and consisting of interest rate, foreign currency, equity and commodity price risks. In the words of Ekinci (2016) and Namasake (2016), market risk exposure is more volatile than credit risk exposure because of rapid changes in market condition that can cause severe financial losses and possible collapse. Market risk is a possible loss from unpredicted movements in financial instruments that are operated in an open market. Mohd et al (2018) reported in their study that Basel Committee on Bank Supervision has implemented expected shortfall to replace value at risk as the advanced risk measure for market risk. Generally, market risks are beyond the capacity of the banks as they are usually occasioned by the economy wide determinants (Aruwa & Musa 2014). Foreign exchange currency exposure and market interest rate serve as indicators for market risk.

Liquidity Risk Management: Liquidity risk arises from the possibility that a company may not be able to generate enough cash or access sufficient funding sources to meet its financial obligations when they become due. This risk can have severe consequences for a company, including bankruptcy or insolvency if not managed effectively. Liquidity risk management refers to the process of identifying, assessing, and managing the potential risks associated with a company's ability to meet its short-term financial obligations. It involves ensuring that a company has sufficient cash or liquid assets to cover its immediate financial needs, such as paying off debts, meeting operational expenses, and funding ongoing projects (Babatunde et al., 2023). Liquidity risk management priorities are to guarantee that bonds are satisfied in full and on schedule and that the Bank manages to meet its deposits, medium-term commitments and financial objectives (Zidan, 2020).

Credit Risk Management: Sound credit risk management is essential to optimising commercial banks' performance (Siriba, 2020; Witzany, 2017). Loans are banks' prime and most apparent

source of credit risk. However, other sources of credit risk exist in commercial banks' activities. Hence, banks' management must set up a credit supervision team to ensure that credit is properly maintained and administered. Effective credit risk management involves establishing a suitable environment, ensuring a sound credit granting process, and maintaining an appropriate credit administration to monitor the process and minimise credit risk exposures (Akomeah et al., 2017; Almekhlafi et al., 2016). Hence, the management of commercial banks needs to ensure the adoption and implementation of a sound risk management framework. The borrowers' credit capability can be assessed using qualitative or quantitative techniques. Borrowers' characteristics using quantitative and qualitative models by assigning numbers with the sum of the values matched up to a threshold (Werner, 2016). This method is called credit scoring" (Tian, 2021; Levy & Zhang, 2019). Sound rating systems will minimise commercial banks' credit risk through borrowing. Counterparty failure to fulfil borrowing commitments is a significant source of credit risks for commercial banks (Afolabi, 2021; Kinyua, 2017).

Operational Risk Management: Thair and Adib (2022) defined operational risk as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events failures. This definition includes legal risk but excludes strategic and reputational risk. According to Okeke et al. (2018), The operational risk known as losses resulting from internal procedures, individuals and systems, or external incidents that are inadequate or defective. This definition contains legal risks and removes reputational and strategic risks. The conventional phrase of operational risk is based on risk sources or events which cause the bank losses from its operational methods. Tandon and Mehra (2017) noted that loss factors are frequent and severe for banks which results in a reasonably high incidence and severe failure. Muriungi et al (2017) posited that the resultant events from the above failures and inadequacies of systems, people, process and external events have now been put into a category of risk referred to as operational risk, a nomenclature that was intended to promote risk visibility, particular risk management, and regulatory intervention. Operational risk became prominent in banking and regulatory circles after a rogue trader caused the collapse of Barings Bank in 1995 and this event highlighted the importance of internal controls and corporate governance in managing financial losses associated with fraud, human errors, and technical failures as well as other breakdowns in normal business processes and operations (Peter et al., 2016).

Concept of Financial Performance

The word financial performance refers to how well an organization's policies help it to reach its planned financial goal in terms of money. Financial performance is a set of measures used to assess the healthiness of banks including some form of risk assessment and it is used as a key internal performance measure for every bank entity. Turyahebya (2013) described the financial performance as the capacity to work proficiently and produce profits and in this way can survive, develop, and respond to the surrounding prospects and challenges. Aguayo (2020) asserted that a company's ability to maximize the utilization of its resources, overall operational effectiveness, as well as the performance of its management, are all indicators of its financial success. Financial performance entails measuring the results of a firm's strategies, policies and operations in monetary terms. Financial performance provides a subjective measure of how well a bank can use its assets to generate revenues (Herciu, 2017). Financial performance is measured using a firm's revenues, liabilities, and cash flow. Financial performance indicators in the form of ratios include profitability, liquidity, financial utilisation structure and investment shareholder ratio (Bouteille & Coogan-Pushner, 2021; Levy & Zhang, 2019). The measure of profitability is by gross profit margin, the amount of money made after deducting the sales/services direct cost. The operating margin lies between the gross and net profitability measures and net profit margin, including all costs. Liquidity ratios indicate the ability to meet short-term obligations. Efficiency ratios indicate how well the business assets are used (Tian, 2021; Lam et al., 2018).

Return on average Assets (ROaA)

Return on average asset is a profitability measure which seeks to ascertain the company's efficiency in asset utilization. It is a profitability ratio that measures how efficient an organization is in utilizing the company's assets to generate earnings or profit. Return on average asset therefore is a measure of the contribution of an average asset to earnings or profit generation. It is a good measure of efficiency. Organizations may have huge amounts in assets or capital but generate little profit or earnings. Figures of assets or capital of an organization are mere absolute figures or amounts. Translating these figures in a clearer perspective gives a clearer view or understanding of efficiency which is necessary for business decision making. Organizations may be carrying in their books, impaired or obsolete assets that are not adding value to the business but may not expect the figures to be put to test of efficiency like this. Therefore return on assets is important as it exposes areas of inefficiency and assets that are not adding values. Such assets therefore may be subjected to asset impairment and subsequently disposed of and possibly replaced where necessary. This ratio is very important to the board and management who regularly appraise themselves to ascertain how efficient and effective they are. Also, to shareholders who always wish to assess their agents (Board and Management) on efficiency and effectiveness to be rest assured of the continuity of the business investment business growth, wealth and dividend maximization. To potential investors who may wish to assess a company's financial strength and efficiency, this profitability ratio is key. Hardgrave et al (2015) defined return on assets as a financial ratio that indicates how profitable a company is in relation to its total assets. Return on assets x-rays the amount of profit earned by a firm in comparison to its total value of assets. The higher the return on asset (ROaA), the better the firm, as a lower ROaA rate may mean lower asset productivity and wastage. It is an expedient indicator of asset intensity. An ideal return on asset figure is a function of the company and industry it operates in. However, a return on assets of 5% or higher is good. It is important for firms that are highly competitive like banks to always watch this ratio. It is therefore important to carry out both vertical and horizontal analysis of this likewise other ratios. In other words, it is important to have a trend analysis to compare it year on year. It is important also to compare it with that of similar firms in the same industry as well as company average.

Theoretical Review

This study anchored on extreme value theory. Extreme value theory was pioneered by Leonard Tippett in 1985, he stated that market risk is the risk of losses in positions arising from movements in market prices. According to Adegbie and David (2020), study on extreme value problem could be dated back to as early as 1709 when Nicolas Bernoulli explained the mean largest distance from the origin when n points lie at random on a straight line of length. Teply (2012) opined that one of the earliest studies on operational risk management was carried out by Embrechts et al in 1997 in which they did the modelling of extreme events for insurance and finance. According to Garrido and Lezaud (2013), extreme value theory primarily aims to predict the occurrence of rare events that are not within the range of the available data and is one of the standard approaches to studying risks; it is a branch of statistics that deal with the extreme deviations from the median of probability distributions i.e. based on the language of probability theory and thus the first question to ask is whether a probability approach applies to the studied risk. As highlighted in the work of Adegbie and David (2020), Extreme value theory is a tool used to determine the probabilities (risks) associated with extreme events and it helps in promoting the assessment and management of extreme financial risks. He opined further that this theory is used by Investors in situations where there is/expected to occur higher stress on investment portfolios and it is also used to model the behaviour of tips (Maxima) and or dips (Minima) in a series of asset returns etc. In recent times, portfolio managers, investors, risk managers, claim managers etc, have become more concerned over occurrences under Extreme market conditions and hence the need for the extreme value theory. Embrechts et al (1999) explained that extreme value

theory helps to quantify market crashes or industry losses and their consequences in a statistically optimal way. The rising complex nature of financial instruments requires sound risk management tool and this theory expands the knowledge of operational risk management in insurance, reinsurance and finance (Okeke et al., 2018).

According to Kioko et al (2019), Extreme value theory (EVA) is a statistics branch that handles the distributions of probability by making sure the extreme values of the medians are taken into consideration. It looks at the trend of a sample so as to observe any extreme values not observed in the previous periods. Several losses are associated with financial industries such as insurance companies and banks, whereby insurance companies often compensate for these losses. EVA takes into notice operational risk and offers some of the ways in which this risk can be controlled and managed by taking the necessary security measures concerning the risk so as to improve the financial performance of an industry .Hence its essential on the prevention and management of operational risk.

One of the criticisms of extreme value methods is that it will only be appropriate if the original dataset is reasonably large and as such extreme value methods have traditionally been used in disciplines where large amounts of data are routinely (and often automatically) collected, such as finance and oceanography.

The extreme value theory is relevance to this study because, it gives better analysis of events or activities or financial risks which could lead to large financial risk in term of market risk loses, liquidity risk loses, credit risk loses and operational risk loses.

Empirical Review

Table 1: Summary of Empirical Studies

S/N	Authors/Year	Research Topic	Research Methodology	Study Findings
1	Jerono and Olweny (2023)	Determined the effect of financial risk management practices on financial performance of microfinance institutions in Kiambu County, Kenya	Both descriptive and inferential statistics were used to analyze the collected data. The statistics were generated by help of Statistical Package for Social Scientist and MS Excel	The results of the analysis revealed that liquidity risk management practices, Operational risk management practices, credit risk management practices, and market risk management practices positively and significantly affects financial performances of microfinance institutions in Kiambu County, Kenya
2	Olajide and Peter (2023)	Examined the impacts of credit risk management on the financial performance of commercial banks	Fifteen (15) years of panel data (2005 to 2019), extracted from the audited financial reports of five first-tier listed banks, was used for the study	The long-run co-integration results revealed that NPL negatively and significantly affects ROA in Nigeria, and ECL positively and substantially affects ROA in Nigeria. The findings suggest that credit risk management has insignificant positive impacts on the financial performance of commercial banks in Nigeria
3	Oluwaleye et al (2023)	Examined the effect of risk management	The study employed correlation analysis,	The result reveals that return on asset is negatively impacted by

		on bank profitability in Nigeria	pooled ordinary least square estimate, and fixed and random effect estimations between 2007 and 2020	liquidity risk, capital risk and bank size while it significantly and positively impacted marketing risk but insignificantly and positively related to operational risk and credit risk. The study concludes that there is a slight tendency for liquidity risk and capital risk to reduce the return on asset
4	Elfriandi (2023)	Determined the effect of enterprise risk management on financial distress of building construction service companies listed on the Indonesian stock exchange the period 2017-2021	The data analysis method was panel data regression analysis which is processed using the EViews program tool 12.0	The results of the study indicate that leverage and liquidity have no effect on enterprise risk management, while cashflow operation has an effect on enterprise risk management. Furthermore, leverage, liquidity, enterprise risk management have no effect on financial distress, while cash flow operation has an effect on financial distress
5	Babatunde et al (2023)	Examined the effect of risk management on the performance of deposit money banks in Nigeria	Panel data analysis techniques were adopted to analyze the secondary data that were obtained from the annual reports of banks	Findings based on the disaggregated model results reveal that both liquidity and capital risk variables exert a negative but insignificant effect on performance. However, credit risk drives performance of the internationally authorized banks positively and significantly. Furthermore, Management quality (MQ) is the only control variable that has a significant influence on the performance of the selected deposit money banks
6	Wajid et al (2023)	Determined the effect of the effect of liquidity risk management on financial performance of commercial banks in Pakistan	The study adopted panel data for Ordinary Least Square analysis	It is concluded that higher liquidity increases banks' performance in commercial banks of Pakistan. The results are in line with a number of studies and available literature. This study can become a good reference for future policy decisions regarding minimum liquidity requirements of banks in this region. The study can be further enhanced using a longer period of study and include more variables specific to banking sector in Pakistan, like bank size, age of bank etc
7	Mária et al (2023)	Studied operational risk management and its effect on the financial	Statistical hypotheses were evaluated with the application of correlation analysis	Empirical findings have confirmed that operational risk management has a significant positive impact on improving the

		management of SMEs between four Central European countries	and linear regression modelling	profitability of the enterprise; on reducing the enterprise's indebtedness as well as in the context of reducing the enterprise's inability to pay its obligations. However, there are disparities in the perception of this influence between owners/managers with regard to the country in which they carry out their business activities
8	Ishmail et al (2023)	Explored the effect of operational risk on financial performance of Microfinance banks in Kenya	The study employed explanatory research design. Unbalanced panel regression model was employed to examine the impact of independent variables on dependent variable using unbalanced panel data	The finding established that operational risk had significant and strong negative relationship financial performance of microfinance banks measured gauged with ROA. Similarly, the results revealed an insignificant weak relationship between operational risk and ROE.
9	Michael and Isaac (2023)	Analysed the effect of credit management techniques on the financial performance of logistics firms in mombasa county Kenya.	Analysis of data was done through Statistical Packages for Social science (SPSS) representing descriptive statistics such as percentages, measures of central tendencies, variation measures and frequencies distribution	The interpretation was based on descriptive statistics and the measures of dispersion as well as inferential statistics were used Pilot test was carried out to ensure the accuracy and validity of the research tools Multi linear regression model was used to analyze effect of credit management techniques on financial performance. The research sought to analyze whether client appraisal process credit risk control collection policy and terms of credit has significant effects on financial performance of logistics firms in Mombasa County
10	Bashir and Umar (2022)	studied the impact of risk management on the financial performance of listed deposit money banks (DMBS) in Nigeria	The Hausman test was chosen because it suggests that a random effect model should be employed for the analysis of the panel data utilized in this study using the ordinary least square random effect regression model	It was determined that there is a statistically significant association between net interest margin (NIM), credit risk management (CRM), liquidity risk management (LRM), and interest rate risk management (INTRM)
11	Wilson (2022)	Evaluated the effect of financial risk on financial performance of insurance	The data obtained was analysed using both qualitative and quantitative analysis	The results showed that working capital management had a little effect on ROE. The study recommended that the insurance

		companies in Rwanda		companies should maintain optimal capital structure and ensure that the companies fully utilize their debt facility according to their capabilities. Financial managers should increase investment in working capital by extending the days in the time for the average payment period so that they can also improve the profitability of the firms
12	Yuliia et al (2022)	Examined the effect of financial risk management model of the banking sector	The article is based on general scientific methods of cognition such as analysis and synthesis, induction and deduction, system-structural method, quantitative and qualitative comparison, and grouping, as well as the method of logical generalization	The article considers the dynamics of financial risk factors of the banking sector and the volume of portfolios that are exposed to risk, in terms of yield on loans in the social and economic spheres, the value of its deposits, the profitability of the market portfolio of securities of banks, and the share of administrative costs in the banking sector. The models for each financial risk factor were built. There were parametric approximations of their historical
13	Salimata et al (2022)	Investigated the effect of financial risk and commercial banks' performance in Nigeria: An empirical review	The secondary data used for the study are collected from the CBs' respective audited financial statements and were analyzed using panel data regression analysis	The results indicate that FXR has positive and statistically significant impact on the EVA; OP has significant but negative impact on the EVA and IR has positive and significant impact on the EVA respectively. The study concludes that financial risks have significant impact on the economic value added of CBs in Nigeria

Source: Researchers compilation (2024)

METHODOLOGY

The methodology of this study consisted of research design, sources and methods of data collection, population and sample of the study, methods of data collection, variables, measurement and model specification.

Research Design: The research design adopted for this study was an ex-post facto research design to investigate the effect of financial risk management and financial performance of listed deposit money banks in Nigeria. This research made use of ex-post facto research design which is also referred to as after the fact design because, it applies where the data for the study already exists hence, it is use for secondary data study.

Population and Sampling Technique: The target population consists of all the fourteen (14) deposit money banks listed on the floor of the Nigerian Exchange Group as at 31st December 2023. Based on the foregoing criteria, a total sample size of nine (9) deposit money banks was

realized employing purposive sampling technique giving rise to ninety (9) data points comprising of nine-year observations (i.e. 2013 -2022) per sampled firm.

Methods of Data Collection: The data for this study was sourced from the published annual reports and accounts of sampled companies for the period 2013 -2022.

Variable, Measurement and Model Specification: The variables that were adopted to measure the effect of financial risk management and financial performance of listed deposit money banks in Nigeria are presented in this section.

Table 2: Measurement of Variables

S/N	Variables	Abbreviation	Type	Measurement
1	Return on average assets	ROaA	Dependent	Profit before taxes divide by total average assets
2	Market risk management	MRM	Independent	Summation of Net interest margin and cost of fund
3	Liquidity risk management	LRM	Independent	Summation of liquid ratio and loan to deposit ratio
4	Credit risk management	CRM	Independent	Summation of Non-Performing Loan Ratio and Capital Adequacy Ratio
5	Operational risk management	ORM	Independent	Summation of Cost to Income Ratio and Cost of Risk
6	Firm Size	FSZ	Moderating Variable	Log of Total Assets

Sources: Desk Researcher (2024), Natufe and Evbayiro-Osagie (2023), Jerono and Olweny (2023), Ishmail et al (2023), Oluwaleye et al (2023), Mária et al (2023), Lukman and Surajudeen (2022) and Thair and Qais (2022), Kioko et al (2019).

Model Specification:

This study investigated the effect of financial risk management and financial performance of listed deposit money bansk in Nigeria from (2013 to 2022). For purpose of this study, we developed the group descriptive statistic, and multiple linear regression analysis. Thus, drawing from the Neo-classical syntheses of Sala-i- Martin (2002), the research analyses was guided by a functional effect in order to establish the variables: the independent variable financial risk management, indices such as market risk management (MRM), liquidity risk management (LRM), credit risk management (CRM) and operational risk management (ORM). These independent variable metrics are used to measures return on average assets (ROaA).

Model I: Return on Average Assets (ROaA) Model

ROAA = f (MRM, LRM, CRM, ORM, FSZ) ……1

This can be written in Ordinary Least Square (OLS) form as:

$ROAA_{it} = a_o + a_1MRM_{it} + a_2LRM_{it} + a_3CRM_{it} + a_4ORM_{it} + a_5FSZ_{it} + U_t$……2

$a_1>0$; $a_2>0$; $a_3>0$; $a_4>0$; $a_5>0$

The work equally evaluated the moderation or interaction effect of firm size (FZS) on the relationship between financial risk management and financial performance indices return on average assets (ROAA) of listed deposit money banks in Nigeria.

The Moderated Multiple Regression (MMR) techniques was used and is specified by adding an interaction term to the unmoderated multiple regression model in equations 2 to arrive at the following MMR models viz:

$ROAA_{it} = \beta_o + \beta_1FRM_{it} + \beta_2FSZ_{it} + \beta_3FRM_{it} + FSZ_{it} + \beta_4FRM_{it}*FSZ_{it} + U_{it}$ …….(3)

Where:

β_1 and β = the coefficients (rate of change) in total financial risk management and firm size

β_4 = the coefficient (rate of change) in the interaction term.

FRM_{it} = total financial risk management (Sum of MRM, LRM, CRM and ORM) of company *i* in year *t*.

$FRM_{it}*FZS_{it}$ = interaction terms of firm size on total financial risk management of company *i* in year *t*.

Method of data analysis: The study adopted descriptive statistics, unit root test, diagnostics test and multiple regression techniques with help of Eview 10 and Statistical Package for Social Science (SPSS v 20) for the purpose of Moderated Multiple Regression (MMR) technique. The descriptive statistics comprises of Mean; median; maximum value; minimum value; standard deviation; Analysis of the Hausman test was carried out after the unit root test and diagnostic test. This test chooses which panel data model is the most appropriate between the Random Effect Model and the Fixed Effect Model. If the prob Chi2 value < 0.05, then the Fixed Effect Model is more relevant, and vice versa.

RESULTS AND DISCUSSIONS

Table 3 Descriptive Statistics of the Variables

	MRM	LRM	CRM	ORM	ROAA	FSZ
Mean	11.27389	107.3847	24.38967	66.87056	1.894000	6.462677
Median	11.55000	107.1000	23.20000	66.70000	1.480000	6.509598
Maximum	16.61000	135.5000	42.20000	151.1000	5.600000	7.440306
Minimum	6.600000	80.10000	-2.000000	36.44000	-2.200000	5.057046
Std. Dev.	1.940903	11.83905	6.323923	15.81357	1.376051	0.510101
Skewness	-0.120574	-0.214213	0.107832	1.545805	0.706025	-0.138901
Kurtosis	3.031899	2.862772	6.475618	10.58787	4.089919	2.854840
Jarque-Bera	0.221886	0.758925	45.47413	251.7518	11.93177	0.368420
Probability	0.894990	0.684229	0.000000	0.000000	0.002565	0.831761
Sum	1014.650	9664.620	2195.070	6018.350	170.4600	581.6409
Sum Sq. Dev.	335.2723	12474.51	3559.288	22256.14	168.5230	23.15811
Observations	90	90	90	90	90	90

Source: Author's computation using E-views 10

The descriptive statistics of the test variables is provided in Table 3. It can be observed that the financial year for which the financial information has been collected ranges between 2013 -2022 of nine (9) listed deposit money banks in Nigeria constituted an observations period of 90(10 x 9). The market risk management (MRM) of the listed deposit money banks has a Mean value of 11.27 with Standard deviation of 1.940 and it ranges between the Mini (6.600) and Max (16.610). The liquidity risk management (LRM) of the listed deposit money banks has a Mean value of 107.384 with Standard deviation of 11.839 and it ranges between the Mini (80.100) and Max (135.500). Furthermore, the credit risk management (CRM) of the listed deposit money banks has a Mean value of 24.38 with Standard deviation of 6.323 and it range between the Mini (-2.000) and Max (42.200). Also, the operational risk management (ORM) of the listed deposit money banks has a Mean value of 66.870 with Standard deviation of 15.813 and it range between the Mini (36.440) and Max (151.100). Based on the result discovered, it can be said that listed deposit money banks in Nigeria manage more of liquidity risk and operational risk compared to credit risk and market risk since they has the highest Mean values, Standard Derivation values, Minimum and Maximum values. Furthermore, the return on averages assets (ROAA) of listed deposit money banks in

Nigeria had a Mean value of 1.894 with Standard deviation 1.376 and it ranges between Mini (-2.200) and 5.600. The skewness statistics indicated that two out of the four dimensions of financial risk management (MRM and LRM) and financial performance measure of return on average equity (ROaE) as well as firm size (FSZ) are negatively skewed which shown this variables has a short right tail while two out of the four dimensions of financial risk management (CRM and ORM) and measure of financial performance (ROaA) are positively skewed which shown the variables has a long right tail. According to the information provided by kurtosis showed that, credit risk management (CRM), operational risk management (ORM) and return on average assets (ROAA) have leptokurtic values, which suggest that the variables are higher than the kurtosis value of (3) that is clearly mesokurtic while market risk management (MRM), liquidity risk management (LRM) and firm size (FSZ) fail kurtosis criteria because their kurtosis value is less than 3. Finally, the Probability of the Jarque-Bera stat for MRM, LRM and FSZ was greater than 0.05 implying that the data on these variables were normally distributed while the Probability of the Jarque-Bera stat for CRM, ORM and ROaA was less than 0.05 implying that the data on these variables were not normally distributed, hence, the researcher need to carry out a normality and diagnostics test to confirm the normality of the variables before further estimation.

Unit Root Test

Table 4 Results Summary of Unit Root

Method 1	**Augmented Dickey Fuller**						
Variables	**MRM**	**LRM**	**CRM**	**ORM**	**ROaA**	**ROaE**	**FSZ**
Level	0.0002	0.0120	0.3301	0.6064	0.3916	0.6493	0.0000
Order of integration	1(0)	1(0)	1(0)	1(0)	1(0)	1(0)	1(0)
Remarks	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary
Method 2	**Im Pesaran and Shin W-stat**						
Level	0.0008	0.0327	0.4701	0.6637	0.3292	0.5813	0.0464
Order of integration	1(0)	1(0)	1(0)	1(0)	1(0)	1(0)	1(0)
Remarks	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary

Source: Author's Computation using E-Views, 10

This study adopted ADF - Fisher Chi-square and Im Pesaran and Shin W-stat techniques to test and verify the series' unit root property and the model's stationarity. The stationary test was conducted to avoid spurious regression problems usually associated with time series econometric modelling. This is necessary to establish whether the time series data is stationary and, if not, to further carry out a diagnostic test and to establish the order of integration and check whether the variables are integrated in the same order. The basic idea behind co-integration is that if two or more series move closely together in the long run, even if they are trended, the difference between them is constant. All variables are examined and found stationary at their level.

Diagnostic Test Results

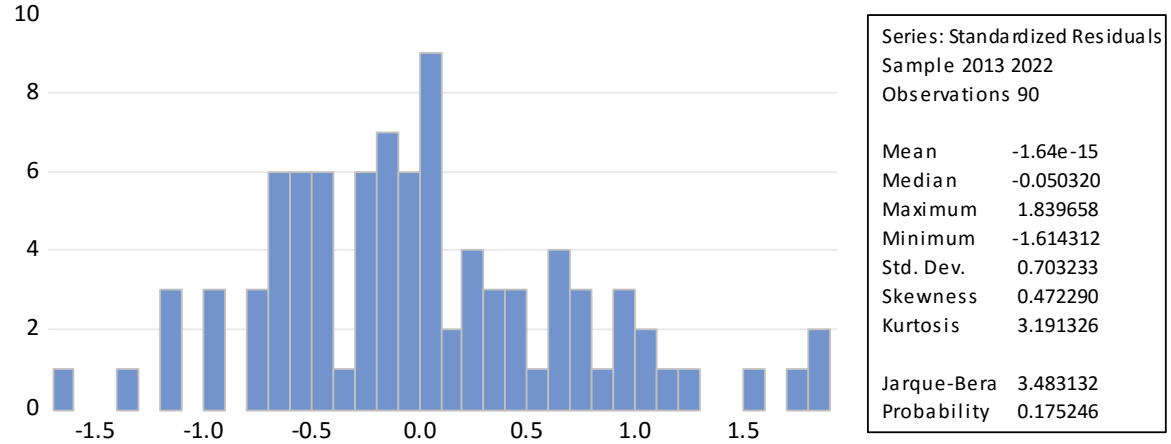
The following sections discuss the results of the diagnostic tests that were conducted to ensure whether the data fits the basic assumptions of the classical linear regression model. The implication of the test, limits therein, test results and their discussion are also presented.

Normality Test

The normality test was conducted to establish whether the observed values follow a normal distribution. The Residual histogram normality test was used to establish whether the observed

values of the variables on the estimation of the model are normally distributed. The results of the Residual histogram normality test are presented in figure 1.

Figure 1 Histogram of Residuals on the Model



Source: Author's Computation using E-Views, 10

The figure 4.1 above disclosed diagnostic test using normality test of residuals histograms as criteria for decision. The result indicates that the skeweness value is positive implies that the model has long right tail, the kurtosis value is greater than 3 that is clearly mesokurtic and finaaly, Jarque-Beta probability value is greater than 0.05 (0.175>0.05) and this means that that the residuals are normally distributed hence fixed effect regression model I can be estimated.

Multivariate Data Analysis

The panel data collected from the nine deposit money banks and for ten years lead to a total sample size of 90 company-years. Random effects and fixed effect regression model has been developed to verify the cause and-effect relationship between the dependent and independent variables. Table 5 disclose Hausman Test for the choice of Random effects and fixed effect regression.

Table 5 Hausman Test for Model One

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.528891	5	0.0897

Source: Author's Computation using E-Views, 10

For the traditional panel data analysis procedure, there is need to select between the fixed effects or random effect models as the best representation of the relationships. From the test results in Table 4.4, the Chi-Square statistic is not significant at any level, thereby rejecting the fixed-effects estimation technique. This implies we adopt the Random Effects for the model one estimation.

Table 6 Regression Analysis of Model

Dependent Variable: ROAA
Method: Panel EGLS (Two-way random effects)
Date: 04/20/24 Time: 02:52
Sample: 2013 2022
Periods included: 10
Cross-sections included: 9

Total panel (balanced) observations: 90
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NRM	0.046465	0.042231	1.100260	0.2744
LRM	-0.001973	0.005191	-0.380121	0.7048
CRM	-0.034519	0.009612	-3.591362	0.0006
ORM	-0.069993	0.006566	-10.66042	0.0000
FSZ	-0.674079	0.253116	-2.663126	0.0093
C	11.46075	2.025194	5.659088	0.0000

Effects Specification	S.D.	Rho
Cross-section random	0.540093	0.6224
Period random	0.129011	0.0355
Idiosyncratic random	0.400391	0.3421

Weighted Statistics			
R-squared	0.582351	Mean dependent var	0.422141
Adjusted R-squared	0.557491	S.D. dependent var	0.638011
S.E. of regression	0.424414	Sum squared resid	15.13066
F-statistic	23.42515	Durbin-Watson stat	1.312163
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.738826	Mean dependent var	1.894000
Sum squared resid	44.01377	Durbin-Watson stat	0.496140

Source: Author's Computation using E-Views, 10

The estimation results depicted that, the R-squared and Adjusted R-squared values of 0.582 and 0.557 respectively are an indication that the model is a good fit. This means more than 55.74% of variations in the financial performance of return on average assets (ROAA) in listed deposit money banks in Nigeria were explained by independent variables, market risk management (MRM), liquidity risk management (LRM), credit risk management (CRM), operational risk management (ORM) as well as firm size (FSZ) indicator included in the model. However, the remaining 44.26% of changes in the financial performance of return on average assets (ROAA) in listed deposit money banks in Nigeria are caused by other factors that are not included in the model. Furthermore, the F-statistic was 23.424 and the probability of not accepting the null hypothesis that there is no statistically significant relationship existing between the dependent variable and the independent variables is 0.0000 which was not greater than 0.05 thus implying that the model was significant and best suited for the regression analysis and that all the independent variables are jointly significant in causing variation in return on average assets (ROAA). The Durbin-Watson statistic test discovered that there is a positive evidence of autocorrelation in the time series data set.

Test of Hypotheses Under Model

Decision: Reject the null hypotheses; probability value is less than 5% significant level. Otherwise; accepted the alternate hypotheses

Statement of Hypotheses

H_{01}: The effect of market risk management on return on average assets of listed deposit money banks in Nigeria is not significant;

H_{02}: The effect of liquidity risk management on return on average assets of listed deposit money banks in Nigeria is not significant;

H_{03}: The effect of credit risk management on return on average assets of listed deposit money banks in Nigeria is not significant;

H_{04}: The effect of operation risk management on return on average assets of listed deposit money banks in Nigeria is not significant;

Decision:

Table 6 disclosed the coefficient and t-Statistics of the estimated marginal effect of market risk management (MRM) on return on average assets (ROAA) of listed deposit money banks in Nigeria. The coefficient and t-statistics of market risk management (MRM) was 0.046 and 1.100, indicating that market risk management (MRM) positively affects return on average assets (ROAA) of listed deposit money banks in Nigeria. An increase in market risk management (MRM) by 1 unit will lead to significant increase in return on average assets (ROAA). This positive effect is not significant since the absolute value of P-value (0.274) was greater than 0.05. This simply indicated that the null hypothesis (**H_{01}**) is accepted and the alternate hypothesis (**H_{a1}**) was rejected. Therefore, it was concluded that the effect of market risk management on return on average assets of listed deposit money banks in Nigeria is not significant. The finding of this study is in consonance with Abdullahi (2021), his result indicates that market risk management has insignificant relationship with financial performance of banks. Kioko et al (2019) findings of the research obtained indicated that market risk had an insignificant negative effect on financial performance. Diby et al (2019) results show that the different measures of market risk have insignificant and negative influences on the companies' financial performance. Oluwaleye et al (2023) examined the effect of risk management on bank profitability in Nigeria. The result reveals that return on asset is negatively impacted by market risk management. Others include; Lenka and Jindřich (2022), Abiodun et al (2021) and Abdullahi (2021) discovered negative or insignificant effect or relationship between market risk manamgnet and financial measures of deposit money banks and other financial institutions with Nigeria and outside Nigeria. However, finding of this study is not in consonance with Jerono and Olweny (2023), their result of the analysis revealed that market risk management practices positively and significantly affects financial performances of microfinance institutions in Kiambu County, Kenya. Shima et al (2022) findings revealed that risk management is positively meaningful while avoiding risk. The findings pointed out that risk management has a significant relationship with the return of assets (ROA). Halbous (2021) result of the research indicated that there was a statistically significant effect of market risks on the financial performance of private commercial banks. Ishmail et al (2023) finding established that operational risk had significant and strong negative relationship financial performance of microfinance banks measured gauged with ROA.

Also, the results in table 6 disclosed the coefficient and t-Statistics of the estimated marginal effect of liquidity risk management (LRM) on return on average assets (ROAA) of listed deposit money banks in Nigeria. The coefficient and t-statistics of liquidity risk management (LRM) was -0.001 and -0.380, indicating that liquidity risk management (LRM) negatively affects return on average assets (ROAA) of listed deposit money banks in Nigeria. An increase in liquidity risk management (LRM) by 1 unit will lead to significant decrease in return on average assets (ROAA). This negative effect is not significant since the absolute value of P-value (0.704) was greater than 0.05. This simply indicated that the null hypothesis (H_{02}) is accepted and the alternate hypothesis (H_{a2}) was rejected. Therefore, it was concluded that the effect of liquidity risk management on return on average assets of listed deposit money banks in Nigeria is not significant. The finding of

this study is in consonance with Oluwaleye et al (2023), their result reveals that return on asset is negatively impacted by liquidity risk. Elfriandi (2023) results of the study indicate that leverage and liquidity have no effect on enterprise risk management. Edwin et al (2023) study found out that Liquidity risk management had an insignificant negative relationship. Oluwaleye et al (2023) examined the effect of risk management on bank profitability in Nigeria. The result reveals that return on asset is negatively impacted by liquidity risk. However, finding of this study is not in consonance with Jerono and Olweny (2023) result of the analysis revealed that liquidity risk management practices positively and significantly affects financial performances of microfinance institutions in Kiambu County, Kenya. Wajid et al (2023) study concluded that higher liquidity increases banks' performance in commercial banks of Pakistan. Juma and Atheruin (2018) result revealed a positive and significant relationship between liquidity risk, interest rate risk and return on assets.

Furthermore, the results in table 6 disclosed the coefficient and t-Statistics of the estimated marginal effect of credit risk management (CRM) on return on average assets (ROAA) of listed deposit money banks in Nigeria. The coefficient and t-statistics of credit risk management (CRM) was -0.034 and -3.391, indicating that credit risk management (CRM) negatively affects return on average assets (ROAA) of listed deposit money banks in Nigeria. An increase in credit risk management (CRM) by 1 unit will lead to significant decrease in return on average assets (ROAA). This negative effect is significant since the absolute value of P-value (0.000) was less than 0.05. This simply indicated that the null hypothesis (H_{03}) is rejected and the alternate hypothesis (H_{a3}) was accepted. Therefore, it was concluded that the effect of credit risk management on return on average assets of listed deposit money banks in Nigeria is significant. The finding of this study is in consonance with Altarawneh and Shafie (2018), their result showed that credit risks have significant negative impact on return on assets (ROA). Mohamed and Onyiego (2018) study concluded that credit risk management significantly affects the financial performance of commercial banks because of failure of counterparties to fulfil their obligations. Jerono and Olweny (2023) results of the analysis revealed that credit risk management practices positively and significantly affects financial performances of microfinance institutions in Kiambu County, Kenya. Apochi and Baffa (2022) study indicated that the moderating role of risk management committee revealed that credit risk has a positive and significant impact on financial performance of deposit money banks in Nigeria. However, finding of this study is not in consonance with Oluwaleye et al (2023) result reveals that return on asset is insignificantly and positively related to credit risk. Olajide and Peter (2023) findings suggest that credit risk management has insignificant positive impacts on the financial performance of commercial banks in Nigeria. The study recommends that banks undertake thorough credit risk assessments before giving out loans to ensure sound credit risk management, protect depositors' funds, avoid banks' distress, and enhance their profitability. Apochi and Baffa (2022) multiple regression result revealed that credit risk has a negative and significant effect on financial performance. Duniamastaki (2022) study concluded that the credit risk management has not any impact with the financial performance of commercial banks in DRC.

Finally, the results in table 6 disclosed the coefficient and t-Statistics of the estimated marginal effect of operational risk management (ORM) on return on average assets (ROAA) of listed deposit money banks in Nigeria. The coefficient and t-statistics of operational risk management (ORM) was -0.069 and -10.660, indicating that operational risk management (ORM) negatively affects return on average assets (ROAA) of listed deposit money banks in Nigeria. An increase in operational risk management (ORM) by 1 unit will lead to significant decrease in return on average assets (ROAA). This negative effect is significant since the absolute value of P-value (0.000) was less than 0.05. This simply indicated that the null hypothesis (H_{04}) is rejected and the alternate hypothesis (H_{a4}) was accepted. Therefore, it was concluded that the effect of operational

risk management on return on average assets of listed deposit money banks in Nigeria is significant. The finding of this study is in consonance with Ishmail et al (2023) finding established that operational risk had significant and strong negative relationship financial performance of microfinance banks measured gauged with ROA. Elfriandi (2023) results of the study indicate that cashflow operation has an effect on enterprise risk management. Mária et al (2023) empirical findings have confirmed that operational risk management has a significant positive impact on improving the profitability of the enterprise. Faun and Oye, (2020) result showed that there is a positive relationship between operational risk management and financial performance of banks. The study also revealed that sound risk management practices impact positively on the financial performance of banks. Babatunde et al (2022) result revealed that operational risk management had a considerable impact on FBN banks' performance measures in Nigeria. However, finding of this study is not in consonance with Oluwaleye et al (2023) result reveals that return on asset is insignificantly and positively related to operational risk. Chintya et al (2022) empirical result showed that operational risk has an insignificant and negative effect on financial performance. Onsongo et al (2019) study found that operational risk had positive insignificant impact on financial performance with the Cost to Income ratio and ROA as proxy respectively.

Moderated Multiple Regression (MMR)

Moderated Multiple Regression (MMR) Estimates of Model (3) in ROAA

Statement of Hypothesis

H_{05}: The moderating effect of firm size on the relationship between total financial risk management and returns on average assets of listed deposit money banks in Nigeria is not significant;

The moderating effect of firm size (FS) on the relationship between total financial risk management and returns on average assets (ROAA) was tested using Moderated Multiple Regression **(**MMR) technique. The overall strength of moderation is summarized in table 7

Table 7 ANOVA[a] Summary of Moderation Analysis of Firm Size in ROAA Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49.369	1	49.369	36.461	.000[b]
	Residual	119.154	88	1.354		
	Total	168.523	89			
2	Regression	49.853	2	24.926	18.274	.000[c]
	Residual	118.670	87	1.364		
	Total	168.523	89			

a. Dependent Variable: ROAA
b. Predictors: (Constant), FRM
c. Predictors: (Constant), FRM, FSZ

Source: Author Computation using SPSS, 25

Table 7 provides information on the unmoderated and moderated results obtained from return on average assets model. The model has F-statistic values 36.461 and 18.274 in its unmoderated and moderated specifications with respective Prob. ** value .000[b] and .000[c] indicated that both the unmoderated and the moderated models are properly fitted since the Prob. ** value is less than the decision criterion of 5%.

Table 8 Model Summary[c] Moderation Analysis of Firm Size in ROAA Model

Model	R	R	Adjuste	Std. Error	Change Statistics	Durbin-

		Square	d R Square	of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Watson
1	.541[a]	.293	.285	1.16362	.293	36.461	1	88	.000	
2	.544[b]	.296	.280	1.16791	.003	.354	1	87	.553	1.725

a. Predictors: (Constant), FRM
b. Predictors: (Constant), FRM, FSZ
c. Dependent Variable: ROAA

Source: Author's Computation using SPSS, 25

Table 8 provides information on the unmoderated and moderated results obtained from return on average assets (ROaA) model. The Durbin-Watson statistic value 1.725 is within the acceptable range of 1 to 3 specified by Field (2009) and this affirmed that the problem of autocorrelation is unlikely to exist in the series. The unmoderated and moderated R^2 for the return on average assets (ROAA) specifications are 0.293 and 0.296 respectively that accounted for only 29.3% and 29.6% of the variations in return on average assets (ROAA) while 70.7% and 70.4% was explained by unknown variables that were not included in the Moderated Multiple Regression model in return on average assets (ROAA). However, for purposes of testing the set hypothesis on the change statistics and other valuable information resulting from the interaction effect of firm size. The unmoderated and moderated R^2 for return on average assets (ROAA) model are 0.293 and 0.296 respectively resulting to R^2 change of 0.003 (0.296 - 0.293). This indicated an increase of 0.3% (0.003 x 100) in the variation explained by the addition of the interaction term in the return on average assets (ROAA) model. Based on the results of the F change statistic value 0.354 with Prob. ** value of 0. 553 > 5% chosen decision criterion for return on average assets model. The study failed to reject the null hypothesis (**H_{05}**) and concluded that the moderating effect of firm size on the relationship between total financial risk management and returns on average assets of listed deposit money banks in Nigeria is not significant. The finding of this study disagreed with Chintya et al (2022) result show that bank size moderates the effect of liquidity and credit risk on financial performance but fails to moderate the effect of market and operational risk on financial performance. Apochi and Baffa (2022) study indicated that the moderating role of risk management committee revealed that credit risk has a positive and significant impact on financial performance of deposit money banks in Nigeria. Salah (2022) studied the relationship between risk assessment and firm size on financial performance of listed insurance firms in Egypt. The results indicate that there is significant positive linear relationship between standard deviation of return on equity, standard deviation of return on asset, and natural logarithm of total assets with return on equity. Ayeni and Emeka (2021) study result revealed that firm size have significant effect on return on asset while age has positive and insignificant effect on return on asset. Onsongo et al (2019) result revealed that firm size as a moderator had significant influence on the relation between operational risk and financial performance. Mulandi (2016) study concluded that bank's size, asset quality, liquidity, capital adequacy and ownership type affect the operational risk of a bank.

CONCLUSIONS

This study investigated the effect of financial risk management on financial performance among listed deposit money banks' in Nigeria. Based on the data analysis, and discussion of findings, and summary of findings above, the study concluded that;

i. The effect of market risk management on return on average assets of listed deposit money banks in Nigeria is not significant;
ii. The effect of liquidity risk management on return on average assets of listed deposit money banks in Nigeria is not significant;
iii. The effect of credit risk management on return on average assets of listed deposit money banks in Nigeria is significant;

iv. The effect of operation risk management on return on average assets of listed deposit money banks in Nigeria is significant;
v. The moderating effect of firm size on the relationship between total financial risk management and returns on average assets of listed deposit money banks in Nigeria is not significant.

Note: The study generally concluded that the effect of financial risk management on financial performance of listed deposit money banks in Nigeria is positive and statistically not significant for the period 2013 - 2022.

RECOMMENDATIONS

Based on the summary of findings and conclusions above, the following recommendations were made:

i. Since increase in market risk management increase financial performance in tern of return on assets of listed deposit money banks, the financial institutions should establish sound market risk committee that would evaluate market investment activities within the firm before investing.
ii. Liquidity risk management has negative and insignificant effect on financial performance in term of return on average assets. Deposit money banks should plan clearly articulate the steps to be taken to address liquidity shortfall during periods of stress or emergency, carryout monitoring activities of the liquidity funding needs of banks to avert any potential liquidity challenge that could trigger crisis is promptly addressed.
iii. Banks should manage their credit risk properly because of its significant effect on return on average assets. Thus, banks should follow the rules guiding credit facilities as non-performing loans of these banks retard their financial sustainability.
iv. The study also recommends that operational risk management should be enhanced because of the insignificant effect on return on equity. This is because potential investors are not likely to invest were their capital will be eroded by financial risk and excessive operating cost.
v. Proper regulations and sanctions should be imposed by banks in managing their firm size so as to enhance financial risk management and financial stability. The purpose for this recommendation was premised on the fact that the moderating effect of firm size on the relationship between financial risk management and financial performance has low positive relationship and insignificant effect.

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