

EFFECT OF OPERATIONAL AND LIQUIDITY RISK ON FINANCIAL PERFORMANCE OF QUOTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

This study investigated the effect of operational and liquidity risk on the financial performance of quoted deposit money banks in Nigeria. The study covers a recent period (2014-2023) to a panel regression design was adopted to accurately capture the effects of operational and liquidity risk on performance, leveraging a sample of 14 deposit money banks quoted on the Nigerian Exchange Ltd. Data were collected through secondary sources, specifically from the annual audited financial statements of the sampled banks. A purposive sampling technique was used to select banks based on specific criteria, including the availability of complete economic data for the study period. Data analysis was conducted using panel regression models, which allowed for robust handling of unobserved heterogeneity and minimized potential endogeneity issues. Random effect regression was adopted as specified by Hausman, and Stata 17 was utilized as a tool for analysis. The findings revealed that Operational risk showed a positive relationship with ROA, suggesting that banks exposed to these risks can achieve higher returns when implementing effective risk management practices. In contrast, liquidity risk did not significantly affect profitability, implying that regulatory liquidity requirements may already mitigate this risk adequately. The study concludes that strategic risk management practices are essential for deposit money banks to leverage certain risks while minimizing the adverse impacts of other risks. The recommendations include enhancing operational risk management practices to maximize profitability, maintaining adequate liquidity reserves to ensure stability.

INTRODUCTION

The financial sector is crucial for economic development in Nigeria, with Deposit Money Banks (DMBs) playing a pivotal role in financial intermediation. As the largest economy in Africa, Nigeria's banking sector significantly influences its economic stability and growth. However, these banks face ongoing challenges, particularly liquidity, credit, market and operational risks, currency risk which impact their financial performance (John et al., 2024).

To maintain the balance between the surplus and deficit units of the economy, Deposit Money Banks (DMBs) transfer deposits from the surplus unit to the deficit unit through loans and other financial services. However, DMBs are exposed to a range of risks because of the complexity and volume of their operations (such as credit risk, operational risk, market risk, liquidity risk, currency risk etc.) that, if improperly managed, could endanger their capacity to generate revenue, uphold a positive reputation, and generally continue to exist (Central Bank of Nigeria, 2019). The financial crisis acquires unparalleled proportions and inflicted long-term damage on economies, countries and people. Every business decision and entrepreneurial act is connected with risk (Aniefor & Amahalu, 2022).

A thorough grasp of the diverse roles banks play in a nation's financial system is essential for theoretical economics and finance. The banking system acts as a conduit for transferring funds from surplus units to those in need. The effectiveness of this financial intermediation process is vital for economic growth and overall well-being (Allen & Carletti, 2016). Deposit money banks are a part of this process, where lenders of funds are primarily households and firms that supply funds to the ultimate borrowers who are mainly firms, governments and households; through financial markets which consist of money markets, bond markets and equity markets and through banks and other financial intermediaries (Allen & Carletti 2016). Thus, one of the major roles of deposit money banks in the financial system is that of financial intermediation.

Financial risk management and its implications on banking sector performance have been fraught with difficulties and challenges that ultimately results to poor banking performance that incubate tendency and leading to unfavourable banking performance with unclear statement of financial position, bank

failure and crisis in the financial sector leading to a systemic risk and thus have a negative functional ramification on economic growth. One of the services that deposit money banks render to their numerous customers is lending. They perform this function bearing in mind the three principles guiding their operations; which are, profitability, liquidity and solvency. When banks pay interest on deposits and receive interest on loans, the difference between the two interest rates constitutes their profit on deposits. Banks can only leverage this profit if the borrowers pay back their loans. However, there is a likelihood that some proportion of the loans may not be paid back; this underscores the need for financial risk management.

From the Nigerian perspective, the problem of financial risks and the financial performance of deposit money banks are quite complex and unresolved, ranging from the problems of poor and inadequate profitability, the problem of unsustainability, inability to create economic value for the shareholders' and meagre returns on assets due to poor utilization of the banks' available assets (Kanu & Isu, 2016).

The main objective of this study is to examine the effect of financial risk on the financial performance of quoted deposit money banks in Nigeria from 2014-2023.

LITERATURE REVIEW

Financial Risk

Financial Risk can be defined as an umbrella term for multiple categories of risk associated with financial transactions. It can further be explained as the possibility of investors losing money if they are investing in a company whose cash flows are inadequate to meet matured obligations. Wani et al. (2015) defined financial risk to be the added variability of the net cash flows of the owners of equity that results from the fixed financial obligation associated with debt financing and cash leasing. Also, financial risk encompasses the risk of cash insolvency. However, this notion will be expanded to include the risk of being unable to meet prior claims with the cash generated by the firm, which is determined by the dispersion of net cash flows and the level of fixed obligations, as well as the firm's pool of liquid resources (Jacques & Nigro, 2017).

Financial risk is the variability of returns, that is, the possibility that actual returns will deviate from expected returns. Financial risk is any type of risk associated with financing and investment (Onsongo et al., 2020).

Operational risk

Operational risk is the risk of a change in value caused by the fact that actual losses, incurred for inadequate or failed internal processes, people and systems, or from external events (including legal risk), differ from the expected losses (Altarawneh & Shafie, 2018). It can also include other classes of risk, such as fraud, security, privacy protection, legal risks, physical (eg. infrastructure shutdown) or environmental risks. Similarly, operational risks affect client satisfaction, reputation and shareholder value, while increasing business volatility. Operational risks refer to the various risks that can arise from a company's ordinary business activities. The operational risk category includes lawsuits, fraud risk, personnel problems and business model risk, which is the risk that a company's models of marketing and growth plans, may prove to be inaccurate or inadequate (Olaoye et al., 2020).

Liquidity Risk

Liquidity refers to the ability of the bank to fulfil its obligations, mainly to depositors (Dang, 2011). Liquidity risk in deposit money banks is defined as the risk of being unable either to meet their obligations to depositors or to fund increases in assets as they fall due without incurring unacceptable costs or losses (Ismail, 2010). Liquidity risk is the possibility of negative effects on the interests of owners, customers and other stakeholders of the financial institution resulting from the inability to meet current cash obligations in a timely and costs efficient manner (Mohiuddin & Shafir, 2018). According to Drehmann and Nikolana (2013) a bank may be unable to meet its short-term financial demands when required to this in referred to as liquidity risk. It normally happens when the firm is unable to convert its short term

assets or security to liquid cash without incurring capital or income loss in the cause. Liquidity is the quickness and certainty with which an asset can be converted into cash income whenever the asset holder desires (Enekwe et al, 2017): Liquidity risk usually arises from management's inability to adequately anticipate and plan for changes in funding sources and cash needs (Ogol, 2011, Awojobi, 2011).

Financial Performance

Performance is synonymous with the organization doing well or otherwise and financial performance is synonymous with the financial well-being of the organization. More succinctly, financial performance is a subjective measure of how well a firm can use assets from its primary mode of business to generate revenues: it refers to a firm's overall financial health over a given period (Bhunja et al., 2011). Financial performance is described as a general measure of how well a bank generates its capital revenue (Toutou & Xiaodong, 2011). Suka (2010) view financial performance as a subjective indicator of how affectively a company uses assets from the primary mode of business to produce revenue. The financial performance also includes an evaluation of the manner the banks are efficiently using their assets and other resources to generate revenues, which affect the firm's overall financial condition for a given period and can be used to compare one sector with another (Hawaladar et al, 2017).

Return on assets indicates the capital intensity of the banking industry, which will depend on the industry, banks that require large initial investments will generally have lower returns on assets (Akong's, 2014). A higher ROA reflects higher managerial efficiency in the company's performance and vice versa (Peavier, 2017).

Operational Risk and Financial Performance

John et al., (2024) assessed the impact of market and operational risk on quoted deposit money banks' financial performance in Nigeria: A Panel Regression Approach. Eight (8) years of data between 2015 and 2023 retrieved from the published annual reports of thirteen (13) DMBs were applied for this study. The analysis includes descriptive statistics and inferential statistics of correlation and panel regression for this study. The outcome of this study posits that the variables MRSK and OPSK have an impact of approximately 66%, 61%, and 65% on ROA for the pooled effect model, fixed effect model, and random effect model, respectively while their impact on EPS shows an impact of about 70%, 74% and 73% correspondingly for all the scenarios applied indicating that MRSK and OPSK are positive and negative predictors respectively. This study concluded that there has been a significant impact of both the MRSK and OPSK on EPS and ROA for the pooled, fixed and random effect model respectively for the period under review. This study recommended that management should prioritize implementing cost management measures to reduce the ratio of operating expenditures, which will ultimately result in improved profit margins. If the bank does not aggressively address recurrent modest losses in its daily operations, which are often caused by its inability to utilize its fixed costs effectively, its demise is inevitable.

Mohammed et al. (2021) examined the moderating effect of bank size on the relationship between operational risk and performance of listed deposit money banks (DMBs) in Nigeria. Data were collected from audited financial reports of selected thirteen (13) listed DMBs in Nigeria over the period of 2014 to 2020. Panel data approach was employed and fixed effects estimate was used for hypothesis testing after the Hausman test was run. The variables used are Banks performance measured by net interest margin, operational risk proxied by cost to income ratio, with Bank size as moderator. The study found that cost income ratio has significant negative effect on profitability of listed DMBs in Nigeria measured by net interest margin at 1% level of significance. However, the study recommends that DMBs should estimate the probability of an operational loss event occurring and the possible effect on bank financial performance on a quarterly basis, as well as implement appropriate internal reporting practices and procedures that are aligned with the scope of operational risk identified by supervisors and the banking industry as a whole.

Gathigia (2016) explored the effect of financial risk on financial performance of commercial banks in Kenya. The quantitative research design was adopted in the study. The target population of this study was the 43 commercial banks licensed by CBK by December 2014. Time Series Cross Sectional unbalanced secondary panel data was analysed. The data was obtained from published financial statements of accounts of all 43 commercial banks in Kenya, CBK, and the Banking survey publications for ten years from 2005 to 2014. The study used financial ratio analysis and panel data techniques of random effects, fixed effects estimation and generalized method of moments, GMM to purge time-invariant unobserved firm specific effects and to mitigate potential endogeneity problems. The pairwise correlations between the variables were carried out. Wald and F- tests were used to determine the significance of the regression while the coefficient of determination, overall, within and between R^2 , were used to determine how much variation in dependent variable is explained by independent variables. Chow and Breusch and Pagan Lagrange multiplier (LM) tests were used to test whether the fixed effects model is better than pooled OLS model and the appropriateness of the random-effects model relative to the pooled OLS model respectively. The findings of the study indicated that credit, market, liquidity and operational risks have significant negative effect on return on equity. The component of financial risk that had the most impact on financial performance was cost to income ratio. The conclusion of the study was that there exists inverse relationship between financial risk and financial performance of Kenyan commercial banks. Hence the commercial banks together with the bank supervisors should make a trade-off between financial risk and financial performance.

Liquidity Risk and Financial Performance

Udenwa et al. (2023) examined the effect of liquidity risk on the financial performance of quoted deposit money banks in Nigeria. The ratio of loans and advances to total assets and the ratio of loans and advances to total deposits were used to measure liquidity risk, while Return on Assets (ROA) was used to measure financial performance. Data were collected from the annual financial reports of each of the deposit money banks. The study utilized panel regression to analyse the data from a sample of eleven (11) quoted deposit money banks on the Nigerian Exchange Group from 2014- 2021. The results of the panel regression revealed that the loans and advances to total assets and loans and advances to deposit have a significant effect on the performance of the quoted deposit money banks in Nigeria. The study recommends that quoted deposit money banks management should diversify their loan portfolio to reduce concentration risk. By diversifying the loan portfolio, banks can spread the risk and reduce the impact of defaults on their performance. The current loans to deposit of 65% ordered by the Central Bank of Nigeria should be sustained. However, bank management should manage their deposit growth to ensure that they have sufficient funds to support their loan and advance activities. This can be achieved by setting appropriate deposit rates.

Nelson (2020) investigated how financial risk impacts the financial performance Kenyan commercial banks. The independent variables in this study were; credit risk, liquidity risk, interest rate risk and operating risk while the dependent variable was financial performance. The control variables were capital adequacy and bank size. The research targeted a population of all the 42 banks in Kenya. Data was from 37 out of the 42 which was a response rate of 88.1% which was considered adequate for the study. The study was conducted for 5 years, 2015- 2019. The research design used during the study was descriptive cross-sectional. Secondary data was gathered from published bank's financial statements and annual reports. Analysis was made using the descriptive, correlation and multiple regression models. The analyzed data was illustrated in tables, charts, percentages, mean and standard deviation. From the results of regression, it was found that the selected independent variables (credit risk, liquidity risk, interest rate risk, operating risk, capital adequacy and bank size) combined explain 32.9% of changes in performance of the banks. The overall model was also found to be statistically significant with a probability value of less than 0.05. The study further revealed that individually, credit risk and interest rate risk are negatively statistically significant to financial performance while capital adequacy is positively and statistically significant to performance. The rest of the variables (liquidity risk, operating risk and bank size) had a statistically insignificant impact on performance. The study recommends the need for banks to come up with measures aimed at reducing credit risk as this will go a long way in improving their performance.

The study further recommended the need for banks to enhance their capital adequacy and interest income as this will have a significant influence on financial performance.

Kamau and Njeru (2016) investigated how liquidity risk affected the performance of insurance companies listed on the NSE, Kenya. They looked at credit risk, operational risk and liquidity risk as the explanatory variable of the study while ROE was used to gauge performance. They used descriptive research design. For the methodology, a multiple regression model was employed. The extreme value theory, credit risk theory and capital Structure theory supported their research. Market risk and operational risks had significant negative effects on the ROE of the insurance companies listed in NSE. The study failed to provide recommendations after the findings.

Mansyur (2017) analysed the effect of financial risk on the financial performance of banks in Indonesia. The analysis uses panel data from the annual report of 23 banks listed on the Indonesian Stock Exchange for the period 2011-2015. Data analysis was conducted using the Smart Pls 3.0 route analysis. Financial success is the endogenous component. Exogenous variables include financial risk, consisting of liquidity risk and credit risk, exchange rate risk and interest rate. The results of the study indicate that credit risk has a negative and significant effect on financial performance. The risk of interest rates has a strong and important effect on financial results. Liquidity risk and exchange rate risk have been insignificant and do not impact the financial performance of banks. The study failed to provide recommendations after the findings.

Obi-Nwosu et al. (2017) examined the effect of liquidity management on the performance of DMBs in Nigeria from 2000 to 2015. The study employs Augmented Dickey-Fuller Unit Root Test, OLS regression and Granger Causality. The study finds that liquidity mechanism is not significantly related to DMBs performance in the short run and long run and also finds that liquidity mechanism granger causes DMBs performance within the period under review in the study. Hence, the study recommends that DMBs should be given leverage of plugging back funds into the investment to boost profitability while maintaining a level of liquidity ratio. They used an inappropriate statistical tool of the ordinary least square regression technique instead of a panel regression to estimate their panel data which might affect the reliability of their findings.

Akinwumi et al. (2017) examined the liquidity management on the profitability of banks in Nigeria between 2007 and 2016, using the Pearson correlation coefficient technique. The empirical results revealed that there is a statistically significant relationship between banks liquidity, return on assets and return on equity. However, the relationship is not all that statistically significant when the return on asset was used as a proxy for profitability. It was suggested that the banks should evaluate and redesign their liquidity management strategy so that it will optimize returns to shareholders' equity and also optimize the use of the assets. The study showed that good management and control of factors influencing the liquidity of commercial banks in the country could improve the financial performance of banks. The study failed to state which of the banks in Nigeria the study dwells on, whether it is deposit money banks, microfinance banks, merchant banks and so on.

Enekwe et al. (2017) examined the effect of liquidity risk on the financial performance of selected quoted commercial banks in Nigeria, covering six (6) years from 2009-2014. They used an ex-post facto research design while variables such as net operating profit margin (NOPM) for dependent variables and Deposits, Cash, Liquidity-Gap, Non-performing loans (NPLs) and Leverage ratio (LEV) for independent variables. Their model estimation was executed using the ordinary least squares technique. Descriptive statistics, Spearman rank- order correlation and regression analysis were applied to the analyses. They found that deposits, cash and non-performing loans have a positive relationship with a net operating profit margin (NOPM), while liquidity-gap and leverage ratios have a negative relationship with a net operating profit margin (NOPM) of selected deposit money banks. They further found that deposits, cash and non-performing loans have a significant effect on net operating profit margin (NOPM); while liquidity-gap and leverage ratio have no significant effect on net operating profit margin

(NOPM). They recommended that banks should establish the required cash in each product segment and maintain the optimal level which will help in reducing the cash balance level and increase their customer deposit base by making the product accessible to more customers, especially the low-income earners. At the same time, banks should consider targeting corporate clients who will be willing to retain a large cash base in the banks for a longer duration. The study used an inappropriate statistical tool of ordinary least square regression technique to estimate their panel data; also, they combined data from both pre (2009-2011) and post (2012-2014) IFRS implementation in Nigeria which affects their study findings. Furthermore, even though their study was published in 2017 their data stopped in 2014 which affects the currency of their study.

Lelgo and Obwogi (2018) investigated the effect of financial risk on the financial performance of microfinance institutions in Kenya. They adopted a quantitative research design while 13 registered microfinance institutions as licensed by the Central Bank of Kenya as of 2018 were used. Secondary data were retrieved from the MFIs annual financial reports spanning 5 years between 2013 and 2017. They used the ordinary least square regression technique to estimate their model. They found that credit risk and liquidity risk have a significant effect on the financial performance of microfinance institutions in Kenya. They recommended that microfinance institutions should review their credit rating policies to improve performance and reduce non-performing loans. Also, to enhance their liquidity position, microfinance institutions should maintain a sound level of current assets that can effectively cover their short-term obligations when they fall due. The study used an inappropriate statistical tool of ordinary least square regression technique to estimate their panel data.

Onyekwelu et al. (2018) appraised the effect of liquidity on the financial performance of deposit money banks in Nigeria. A sample of five (5) banks was used for the study. Secondary data were collected from the firms for ten years period, 2007-2016. The data were analyzed using multiple regression analysis. Results show that Liquidity has a positive and significant effect on banks' profitability ratios and that liquidity also has a positive and significant effect on the Return on Capital Employed. The study recommended that the Central Bank of Nigeria must critically review and follow-up or monitor the effectiveness of liquidity policy tools in banks and where necessary, appropriate sanctions placed on erring banks to ensure effective implementation of these policy tools in an attempt to achieve desired liquidity level. The study used an inappropriate statistical tool of ordinary least square regression technique instead of a panel regression to estimate their panel data which might affect the reliability of their findings.

Financial Distress Theory

Baldwin and Scott (1983) purported that when a firm's business deteriorates to the point where it cannot meet its financial obligation, the firm is said to have entered a state of financial distress. The first signals of financial distress are continuous increases in financial risks, violations of debt payments and failure or reduction of dividends payouts. Whitaker (2009) defines an entry in financial distress as the first year in which cash flows are less than current maturities" long-term debt. The firm has enough to pay its creditors as long as the cash flow exceeds the current debt obligations. The key factor in identifying firms in financial distress is their inability to meet contractual debt obligations

However, substantial financial distress effects are incurred well before default. Wruck (2010) stated that firms enter into financial distress as a result of economic distress, declines in their performance and poor management, especially on risks. Boritz (2011) depicts a process of financial distress that begins with an incubation period characterized by a set of bad economic conditions and poor management which commits costly mistakes. In the case of deposit money banks, the ability to provide cash to depositors and loans to borrowers as and when the demand may constitute a liquidity crisis. Other creditors also need to be taken into account when firms are putting in place risk management measures. Credit risks in banks also need to be addressed since they may lead to financial distress. Loan portfolio management is an important determinant of the firm's liquidity. The banks should manage operational risk, liquidity risk, credit risk, market risk and currency risk to avoid financial distress.

The theory of financial distress emanates from the financial risk facing a firm. This theory provides a non-biased perspective on the relationship between financial risk and financial performance variables employed by the study. By providing information that the effects of financial distress occur before default risk, the theory offers a neutral platform to undertake an incisive empirical analysis of this relationship within the deposit money banks.

This study aligned with the financial distress theory. The financial distress theory relates to liquidity risk and credit risk. The theory of financial distress emanates from the liquidity and credit risk facing a bank. A bank is in a state of financial distress if it cannot meet its maturing obligations. Also, the signal of financial distress comes from the continuous increase in financial risks which could hamper financial performance. Therefore, banks need to manage liquidity risk to keep performing financially and avoid financial distress.

METHODOLOGY

The study adopted ex post facto research design to examine the effects of financial risk on the performance of quoted deposit money banks in Nigeria. Ex post facto research design is a quasi-experimental study and is appropriate for this study as it will examine how independent variables (operational risk, liquidity risk) affect a dependent variable (Return on Asset). A quasi-experimental study simply means participants are not randomly assigned. This sought to ascertain the effects of financial risk on the performance of quoted deposit money banks in Nigeria.

All the thirteen deposit money banks quoted on the floor of the Nigerian Exchange Group as of December 2023 form the population of the study. The data is collected from secondary sources of data which are: Annual reports of deposit money banks, corporate journals, academic journals, published books, seminar papers/projects, scholarly magazines, publications, documents, articles and online portals for 2013 to 2023. This study employed panel regression analysis to estimate each of the financial risk variables (Operational risk and liquidity risk,) with the performance (return on asset) of quoted deposit money banks in Nigeria. The data collected was analyzed using E-views version 10. Descriptive statistics, correlation and panel regression analysis were carried out and post estimation analyses such as the Heteroskedasticity test, serial correlation and stability test were also carried out.

The model adopted for this study is given thus:

$$ROA_{it} = \beta_0 + \beta_1 OPR_{it} + \beta_2 LQR_{it} + e_{it}$$

Where;

ROA= Return on Asset of firm i at time t

OPR = Operational Risk of firm i at time t

LOR = Liquidity Risk of firm i at time t

β_0 = Constant

e_{it} = Error term

Table 1: Measurement of Variables

Variables Specification	Proxied by	Description	Sources
Dependent Performance	Return on Asset (ROA)	EBIT/Total Assets	Hassun Al-Tamim Mininoul, and Elkelis (2015), Kumar and Kuma (2018)
Independent Financial Risk	Operational Risk (OPR)	Operating Expenses and Operating Income	Froot (2017)
	Liquidity Risk (QR)	Total Loan Customer Deposits	El-faham (2020)

RESULT AND DISCUSSIONS

This study is panel in nature and as such the data were extracted from the audited annual financial statements of 14 listed deposit money banks for a period 10 years (2014 to 2023) cumulating into 140 financial year observations.

Descriptive Statistics**Table 2**

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	140	2.667	1.365	.51	4.96
opr	140	5.323	2.828	1.01	9.99
lor	140	10.165	2.725	5.08	14.79

Stata output, 2024

The descriptive statistics in Table 1 provide a comprehensive summary of the variables measured in this study: Return on Assets (ROA), Operational Risk (OPR), Liquidity Risk (LOR). These statistics, based on 140 observations, offer insight into both the central tendency (mean) and the dispersion (standard deviation) of each variable, along with the minimum and maximum values, which reveal the range of values across the sample.

Return on Assets (ROA) has a mean value of 2.667, suggesting that, on average, the firms generate a 2.67% return on their assets, reflecting their profitability. However, the standard deviation of ROA is 1.365, indicating notable variability in returns across firms. This variability implies that some firms perform considerably better or worse than the average. The minimum ROA of 0.51 indicates a few firms with low profitability, while the maximum ROA of 4.96 highlights that certain firms achieve significantly higher returns, nearing 5%. This range suggests that while some banks manage their assets efficiently to generate high returns, others may struggle with profitability, possibly due to greater exposure to various financial risks.

Operational Risk (OPR), a measure of risks arising from failed internal processes or external events, has a mean of 5.323 with a relatively high standard deviation of 2.828. This variation implies substantial differences in operational risk management practices across firms, potentially impacting their operational efficiency and resilience. The minimum OPR of 1.01 reflects that some firms operate with minimal operational risk exposure, perhaps due to robust internal controls and effective risk management frameworks. Conversely, the maximum OPR of 9.99 suggests that some firms face considerable operational risks, which may affect their stability and profitability. The relatively high mean and standard deviation of OPR underscore the importance of strengthening operational controls and ensuring compliance with regulatory standards across the industry.

Liquidity Risk (LOR) has an average value of 10.165, suggesting that firms, on average, are managing relatively high liquidity risks. This variable also has a standard deviation of 2.725, indicating some dispersion in liquidity management strategies among firms. A minimum LOR of 5.08 reveals that a few firms maintain strong liquidity positions, which may enhance their ability to meet short-term obligations without liquidating assets or securing costly borrowing. However, the maximum LOR of 14.79 shows that some firms face significant liquidity constraints, which may strain their capacity to fulfill short-term liabilities in challenging market conditions. These findings highlight that firms with higher liquidity risk may face elevated costs or challenges in ensuring sufficient liquidity buffers.

Correlations Matrix**Table 3 Matrix of correlations**

Variables	(1)	(2)	(3)
(1) roa	1.000		
(2) opr	0.032	1.000	
(3) lor	0.130	-0.022	1.000

Stata output, 2024

The correlation matrix presented in Table 2 shows the pairwise correlations between the variables under study: Return on Assets (ROA), Operational Risk (OPR), and Liquidity Risk

Starting with the primary variable of interest, ROA, we observed that it has a weak positive correlation with most risk factors. ROA and Operational Risk (OPR) have a very low positive correlation (0.032), indicating that there is no substantial association between profitability and operational risk in this sample. This weak relationship suggests that, on average, operational risk does not significantly influence the banks' profitability, although this does not rule out the potential for some firms to experience operational challenges that impact performance.

The correlation between ROA and Liquidity Risk (LOR) is slightly stronger at 0.130, though still weak. This positive correlation implies that firms with higher liquidity risk tend to have marginally better returns on assets. While this may seem counterintuitive, it could reflect that firms taking on more liquidity risk might have better opportunities to deploy assets in profitable ventures, although this strategy could also introduce financial strain if liquidity becomes insufficient.

Hausman Specification Test

In panel data analysis (data analysis over time), the Hausman Test can help choose between a fixed effects model or a random effects model that is appropriate for interpretation. To examine whether endogeneity exists, which could potentially lead to a biased coefficient, a Hausman specification test to make the choice between Fixed Effect (FE) and Random Effect (RE) regression was performed. This test is necessary, considering that there is a trade-off between the random effect's efficiency and the fixed effect's consistency. The test also determines whether the estimates of the coefficients, taken as a group, are significantly different in the two regressions. If any variables are dropped in the fixed effects regression, they are excluded from the test. The Hausman test result is presented below;

Hausman (1978) specification test

Table 4

	Coef.
Chi-square test value	.335
P-value	1

Stata Output, 2024

The Hausman specification test, as shown in Table 4, assesses whether the fixed-effects or random-effects model is more appropriate for the panel data regression analysis. The null hypothesis (H_0) of the Hausman test is that the preferred model is random effects, meaning there is no correlation between the individual effects (unobserved variables) and the regressors. In contrast, rejecting the null hypothesis would suggest that a fixed-effects model is more suitable, as it would indicate correlation between the individual effects and the independent variables.

In this output, the chi-square test statistic is 0.335, and the associated p-value is 1. Since the p-value is well above conventional significance levels (e.g., 0.05 or 0.10), we fail to reject the null hypothesis. This result indicates that there is no significant correlation between the individual effects and the regressors, supporting the appropriateness of the random-effects model for this analysis.

Selecting the random-effects model over the fixed-effects model means that the unique characteristics of each firm are treated as randomly distributed and uncorrelated with the independent variables, allowing for more efficient estimation of coefficients. This outcome implies that the random-effects model provides unbiased and efficient estimates in this context, making it suitable for examining the effects of various financial risks on the return on assets (ROA) across firms in this sample.

Regression Result

Table 3 Random Effect Regression results

roa	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
opr	.028	.009	3.09	.002	.01	.046	***
lor	.041	.028	1.46	.145	-.014	.096	
Constant	1.087	.363	3.00	.003	.376	1.798	***

Mean dependent var	2.667	SD dependent var	1.365
Overall r-squared	0.519	Number of obs	140
Chi-square	163.390	Prob > chi2	0.000
R-squared within	0.585	R-squared between	0.405

*** $p < .01$, ** $p < .05$, * $p < .1$

Stata output, 2024

The Random Effects Regression results in Table 3 provide insights into the impact of various risk factors operational Risk (OPR), Liquidity Risk (LOR), on the Return on Assets (ROA) for firms in the sample. The coefficients, standard errors, t-values, p-values, and confidence intervals indicate both the magnitude and statistical significance of each risk factor's effect on ROA.

Starting with Operational Risk (OPR), the coefficient is 0.028 with a standard error of 0.009, yielding a t-value of 3.09 and a p-value of 0.002. This positive and statistically significant result ($p < 0.01$) implies that for each unit increase in operational risk, ROA increases by approximately 0.028. This may suggest that, within the sample, higher operational risk is associated with slightly better returns, potentially due to increased risk-taking or operational efficiencies among firms with higher OPR. The confidence interval for this coefficient, ranging from 0.01 to 0.046, reinforces the precision of this estimate.

Liquidity Risk (LOR) has a coefficient of 0.041 with a standard error of 0.028, resulting in a t-value of 1.46 and a p-value of 0.145. This coefficient is positive, but it is not statistically significant at conventional levels. Therefore, we do not have enough evidence to conclude that liquidity risk has a significant impact on ROA within this sample. The confidence interval for LOR ranges from -0.014 to 0.096, which includes zero, further indicating that its effect on ROA may be minimal or inconsistent across firms.

The constant term is 1.087 with a standard error of 0.363, resulting in a t-value of 3.00 and a p-value of 0.003, indicating that when all risk factors are zero, the average ROA would be approximately 1.087. This value captures the baseline profitability of firms in the sample, independent of risk exposures.

Additional model statistics indicate the model's explanatory power. The overall R-squared is 0.519, indicating that the risk variables together explain about 52% of the variance in ROA. The R-squared within value is 0.585, showing that the model explains 58.5% of the variation within firms over time, while the R-squared between value is 0.405, indicating that 40.5% of the variation between firms is explained by the model. The chi-square test statistic for the overall model is 163.390 with a p-value of 0.000, suggesting that the model is statistically significant and that the risk factors collectively have a significant impact on ROA.

CONCLUSION AND RECOMMENDATIONS

The study has established that financial risks significantly influence the financial performance of quoted deposit money banks in Nigeria. Specifically, operational positively impact profitability, underscoring the importance of robust risk management practices that can turn potential challenges into opportunities for higher returns. Conversely, Liquidity risk showed no significant effect on profitability, suggesting that existing regulatory frameworks may already address this risk adequately. Overall, effective risk management is vital for balancing profitability and stability in the banking sector.

This study therefore made the following recommendations:

- Enhance Operational risk Management: Deposit money banks should invest in advanced risk assessment tools and technologies to monitor and manage operational and market risks effectively. Training programs and awareness campaigns can further strengthen the capacity of employees to handle these risks.
- Maintain Adequate Liquidity Reserves: Although liquidity risk did not show a significant effect on profitability, banks should continue to adhere to regulatory liquidity requirements. Regular liquidity stress

testing and maintaining high-quality liquid assets can further enhance resilience against unexpected liquidity shocks.

By implementing these recommendations, deposit money banks can better navigate the complex landscape of financial risks, ensuring sustained profitability and stability in an increasingly volatile financial environment.

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