

EVALUATING THE IMPACT OF THE MANAGEMENT OF CREDIT RISK, MARKET RISK AND LIQUIDITY RISK ON THE PERFORMANCE OF BANKS IN NIGERIA

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Abstract

This study examines the impact of credit risk management, market risk management, and liquidity management on bank profitability, with Earnings per Share (EPS) serving as the key performance measure. Using panel data and employing both fixed and random effects models, the analysis finds that credit risk indicators specifically, the ratio of non-performing loans to loans and advances (NPLLA) and the ratio of loan loss provisions to total assets (LLPTA) - have a significant negative effect on bank earnings. In contrast, measures of financial intermediation efficiency, such as the loans-to-deposits ratios (LATD and TDLA), show a positive and significant relationship with EPS. Market risk, particularly foreign exchange volatility (FER), negatively influences profitability, while liquidity management indicators, aside from bank size (BKS), are not significant predictors of EPS. The Hausman test confirms the suitability of the random effects model, which provides a stronger explanatory power. The findings highlight the critical importance of robust credit risk management, effective foreign exchange risk mitigation, and strategic bank growth in enhancing earnings performance. Policy implications suggest that banks should strengthen risk assessment practices, regulators should enforce higher supervisory standards, and strategic consolidation in the sector should be encouraged. Overall, the study offers valuable insights for both practitioners and policymakers aiming to improve the financial health and stability of the banking sector.

Keywords: Credit risk, Market risk, Liquidity risk, Earnings per Share

1.0 Introduction

The banking industry stands as the cornerstone of modern economies, facilitating financial intermediation, supporting economic development, and fostering global trade. However, the operational environment for banks is fraught with various forms of financial risks, among which credit risk, market risk, and liquidity risk are the most critical (Smith, 2023). The ability of banks to efficiently manage these risks has become a key determinant of their financial stability, profitability, and long-term performance (Jones & Taylor, 2022). In light of recent global financial crises and heightened regulatory scrutiny, effective risk management is no longer an ancillary function but a strategic imperative for the survival and competitiveness of banks (Zhao et al., 2024).

Credit risk that counterparty will fail to meet its obligations in accordance with agreed terms remains the most prominent threat to a bank's financial health (Lee, 2023). High levels of non-performing loans and loan defaults can erode a bank's capital base, reduce profitability, and threaten its existence (Williams & Brown, 2022). Effective credit risk management enables banks to minimize losses, preserve asset quality, and enhance shareholder value (Khan et al.,

2023). Techniques such as credit scoring models, credit diversification, and collateral management have become essential tools in mitigating credit exposure and ensuring the stability of banks' lending portfolios (Davies & Patel, 2023). Market risk, on the other hand, arises from adverse movements in market variables such as interest rates, foreign exchange rates, equity prices, and commodity prices (Miller, 2024). These fluctuations can directly impact the valuation of assets and liabilities, affecting a bank's trading and investment portfolios (Carter & Singh, 2023).

With the increasing complexity of financial markets and the globalization of banking operations, exposure to market risk has intensified (Nguyen, 2025). Efficient management of market risk - through hedging strategies, Value at Risk (VaR) models, and portfolio diversification - is essential for protecting earnings and maintaining capital adequacy (Fletcher & Li, 2024). Liquidity risk is the risk that a bank will be unable to meet its short-term financial obligations when they fall due without incurring unacceptable losses (Tanner & Lee, 2024). The global financial crisis of 2007–2008 starkly highlighted the catastrophic consequences of liquidity shortfalls, prompting regulators to impose stricter liquidity standards such as the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) (Harris et al., 2022). Effective liquidity risk management ensures that banks can access sufficient funding sources, maintain public confidence, and avert insolvency during periods of financial stress (Walker & Davis, 2023).

Most researchers such as Alshatti (2015); Kimotho and Gekara (2016); Shieler, Emenike and Amu (2017); Chipa and Wamiori (2017); Kolapo, Ayeni and Oke (2012); investigated the effect of risk management on performance using variables such as credit and liquidity risk management. However, the current study has a wider scope by covering additional important variables of market risk management that were omitted in previous studies such as foreign exchange risk and interest rate sensitivity ratio. This is because market risk comprises of exchange rate and interest rate risks which affect the financial performance of banks. Usually, Market risks are outside the control of the banks, as they are determined by factors that affect the overall economy (Aruwa & Musa, 2014). There is need to examine the effect of financial risk management on the performance of deposit money banks in Nigeria. This paper aims to (a) examine the effect of credit risk management on the performance of deposit money banks in Nigeria; (b) determine the effect of market risk management on the performance of deposit money banks in Nigeria; and (c) evaluate the effect of liquidity risk management on the performance of deposit money banks in Nigeria.

This research seeks to bridge existing gaps by investigating the impact of the management of credit risk, market risk, and liquidity risk on the performance of banks. Specifically, it examines how risk management practices influence key performance indicators such as return on assets (ROA), return on equity (ROE), and capital adequacy ratios (Taylor et al., 2023). The study also aims to explore whether the effectiveness of risk management varies across different banking sectors and economic conditions (Kumar & Sharma, 2023). The findings of this research are expected to offer important implications for bank managers, regulators, policymakers, and investors. By providing empirical evidence on the critical linkages between risk management and bank performance, the study aims to contribute to the development of more resilient, efficient, and competitive banking institutions (Smith & Gupta, 2024).

The remainder of this paper is organized as follows: Section 2 presents a review of relevant literature on risk management and bank performance; Section 3 outlines the research methodology and data sources; Section 4 discusses the empirical results; and Section 5 concludes with policy recommendations and suggestions for future research.

2.0 Literature Review

Credit Risk Management and Banks' Performance

The relationship between credit risk management and the performance of banks has been a focus of recent studies across both developed and developing countries (William, 2012; Kodithuwakku, 2014; Isanzu, 2017). Credit risk refers to the potential loss to earnings or capital that arises when a borrower fails to meet the terms of a bank's contract. This type of risk poses a significant threat to a bank's performance, and if left unaddressed, it can lead to the bank's collapse. Heffernan (1996) emphasized that credit risk involves the possibility that an asset or loan will become irrecoverable, either due to outright default or delays in servicing loans. When credit risk materializes or becomes persistent, it impacts the bank's performance, profitability, and shareholder value. Cooper, Jackson, and Patterson (2003) argued that fluctuations in credit risks influence the health of a bank's loan portfolio, thereby affecting its overall performance.

Increased exposure to credit risk can result in a decline in profitability, as higher credit risk often leads to a larger proportion of bad and doubtful debts, which erode the bank's profits. Persistent credit risk reduces profitability and hinders operational performance. Non-performing loans (NPLs) are loans that are in default or have uncertain repayment prospects. According to Mohd, Sok-Gee, and Sallahudin (2010), managing NPLs is associated with high operational costs, which can reduce capital growth in the affected banks. NPLs diminish liquidity, disrupt credit expansion, and slow economic growth, which directly affects the bank's performance. Somoye (2010) further suggested that NPLs diminish investor confidence in the banking system, deterring investments.

Liquidity Risk Management and Banks' Performance

The IFSB's Guiding Principles of Risk Management (2005) defines liquidity risk as the potential loss a bank faces due to its inability to meet obligations or fund asset increases without incurring significant costs or losses. Liquidity is the ability of a bank to meet short-term obligations, or the capacity to convert assets into cash when needed (Taylor, 2001). It is a crucial component for a bank's stability. Inadequate management of liquidity is comparable to "throwing good money after bad" (Olashore, 1990). A liquidity crisis can lead to insolvency and bank runs, so minimizing liquidity risk is vital for a bank's asset and liability management. William (2012) noted that the primary goal of liquidity risk management is to reduce the impact of maturity mismatches on a bank's financial position. Liquidity refers to the ability of a bank to meet cash demands, which forms part of the institution's working capital.

Cooper, Jackson, and Patterson (2003) emphasized that the more capable a financial institution is in meeting its customers' demands, the more liquid it is considered to be. However, bank managers often face pressure from shareholders to increase profits by investing in long-term securities and reducing idle cash balances, which can undermine liquidity and make it harder to meet withdrawal and credit demands (Somoye, 2010). Banks that consistently fail to meet obligations can be considered financially unhealthy. According to Crowe (2009), even a bank

with good asset quality and strong earnings may fail if it does not maintain sufficient liquidity. Shareholders may prefer less liquidity due to its impact on profitability, but they also recognize that inadequate liquidity can prevent the bank from securing incentives from suppliers and creditors. Thus, maintaining a certain level of liquidity is essential for a bank's operations. Olagunju, Adeyanju, and Olabode (2011) argued that the survival of a bank depends on its liquidity, as illiquidity can lead to public distrust and loss of confidence in the banking sector. Understanding cash flow movements and addressing liquidity pressures are crucial for banks to prevent financial distress (Taylor, 2001). To manage liquidity, banks must comply with legal reserve requirements and avoid excessive or insufficient reserves, which could affect their financial health.

Market Risk Management and Financial Performance

Market risk is a major source of income variability for financial institutions globally. Koch and MacDonald (2006) categorized market risk into three primary subtypes: stock price risk, interest rate risk, and foreign exchange risk. Worzala (1995) highlighted that market risk can also arise when banks accept financial instruments that are exposed to market price fluctuations as collateral for loans. Price volatility increases and decreases in the market, influencing the performance of stocks and options. The greater the market volatility, the higher the likelihood of significant gains or losses. Market risks are commonly divided into interest rate risk and exchange rate risk, as well as risks related to share prices and commodity prices. Interest rate risk is a particular concern and requires ongoing management in the banking sector. Although most banks distinguish between their trading activities and their balance sheet interest rate exposure, Izanju (2016) suggested that large banks with active trading businesses must invest in systems to manage these risks effectively. However, these trading risk management systems often vary from one bank to another and may not always be as robust as perceived.

Empirical Review

Kuo and Enders (2004) explored credit risk management practices among state banks in China through a survey method. At a 10% significance level, they found that the growing openness of China's financial markets posed unprecedented challenges to state-owned banks. Li Yuqi (2007) analyzed factors influencing bank profitability and their impact on risk management in the UK, using regression analysis on time-series data from 1999 to 2006. Internal factors like liquidity, credit, and capital, along with external factors such as GDP growth, interest rates, and inflation, were considered.

Ravindra, Vyasi, and Manmeet (2008) studied the impact of capital adequacy on the profitability of Indian banks using panel data models, finding that higher capital adequacy boosts profitability. Hosna et al. (2009) also emphasized that higher capital requirements positively influence bank profitability. Kithinji (2010) assessed credit risk management in Kenyan commercial banks, revealing that profits were not primarily affected by credit volume or non-performing loans, suggesting other factors play a role. Nakeba (2010) investigated the role of credit management at Centenary Bank, Uganda. The findings showed that strict adherence to credit procedures and active loan committee oversight were critical for loan portfolio performance. Al-Khoury (2011) evaluated 43 commercial banks across Gulf Cooperation Council countries, concluding that credit, liquidity, and capital risks are major factors influencing ROA, while only liquidity risk significantly affected ROE.

Aduda and Gitonga (2011) linked credit risk management to profitability among Kenyan banks using regression analysis, finding a significant relationship at the 5% level. Mekasha (2011) similarly found a negative relationship between credit risk and bank performance in Ethiopia using secondary and primary data. Almazari (2011) studied seven Jordanian banks and found ROA had a strong negative correlation with bank size and a strong positive correlation with asset management efficiency.

Epure and Lafuente (2012) investigated Costa Rican banks, concluding that regulatory changes improved performance, while non-performing loans negatively impacted efficiency and ROA. Poudel (2012) analyzed Nepalese banks and found default rate, cost per loan asset, and capital adequacy negatively impacted performance, with default rate being the most influential. Afriyie and Akotey (2012) studied rural banks in Ghana, finding that higher non-performing loans still coincided with profitability. Boahene et al. (2012) also observed a positive relationship between credit risk and profitability in Ghanaian banks. Raad (2015) found a strong positive relationship between ROA and non-performing loans, loan loss provisions, and capital adequacy ratio in Bangladesh. Haron et al. (2012) studied microfinance institutions in Kenya, finding interest rates and client appraisal significantly influenced loan performance. Devinaga et al. (2012) analyzed Malaysian banks, showing volatility significantly affected risk-adjusted returns.

Gizaw et al. (2015) found credit risk indicators significantly affected profitability in Ethiopian banks. Felix and Claudine (2008) concluded that non-performing loans reduce ROA and ROE. Kargi (2011) confirmed that poor credit risk management harms Nigerian banks' profitability. Muhammed et al. (2012) found significant negative impacts of credit risk on Nigerian banks' profitability. Kolapo et al. (2012) showed that credit risk consistently affects Nigerian banks, with non-performing loans lowering ROA. Abayomi and Oyediji (2012) linked effective credit risk management to shareholder wealth in Nigerian banks. Abdullahi (2013) found that non-performing loans positively influenced profitability at Union Bank.

Taiwo and Abayomi (2013) found a significant relationship between GDP and non-performing loans. Asikhia and Sokefun (2013) showed a positive relationship between capital adequacy and profitability. Ogbo and Unuafe (2013) highlighted that capital adequacy and liquidity ratios positively affect bank performance, while loans and advances have a negative impact. Adeusi et al. (2013) showed an inverse relationship between doubtful loans and financial performance, recommending prudent risk management. Ejoh, Okpa, and Egbe (2014) also found significant relationships between credit management, liquidity, and profitability. Alalade et al. (2014) demonstrated that effective credit risk management significantly enhances profitability in Lagos banks. Iwedi and Onuegu (2014) found that non-performing loans had a minimal negative effect, while increased loans and advances improved bank performance.

In Nigeria, Imeh et al. (2025) found a significant relationship between credit risk management practices and the profitability of listed banks, emphasizing that effective strategies can substantially improve financial performance. Similarly, Natufe and Evbayiro-Osagie (2023) identified capital adequacy, risk asset ratios, non-performing loans, and bank size as major drivers of return on equity in Nigerian banks, highlighting concerns about reliance on offshore borrowing. Meanwhile, Odume et al. (2023) observed that while the loan impairment ratio had a slightly positive (but not statistically significant) effect, capital adequacy surprisingly showed a

negative relationship with return on capital employed, suggesting a need for stronger internal monitoring systems and experienced risk managers.

In Ethiopia, Legass and Roba (2024) analyzed 13 years of data from commercial banks and concluded that while credit interest income and loan ratios positively influence profitability, non-performing loans have a consistently harmful effect on financial performance. Similarly, a 2024 study from the Democratic Republic of the Congo showed that strong capital adequacy improves profitability, whereas higher non-performing loan ratios hurt overall bank health, emphasizing the critical balance between lending and risk management practices.

Expanding the view to Pakistan, Mahmood et al. (2023) revealed that liquidity positively affects bank performance, but capital adequacy, non-performing loans, and aggressive loan growth tend to diminish it. Their findings argue for tighter credit risk policies to ensure sustainable bank performance. Globally, major financial institutions like Capital One have adjusted their credit risk strategies in 2025, reflecting shifting economic conditions. For example, rising delinquencies have led banks to boost reserves for potential losses, but improving consumer financial health has also allowed some banks to reduce these reserves, showing a flexible, responsive approach to credit risk management

Accordingly, the paper is guided by the following research hypotheses:

H01: Credit risk management does not have significant effect on the performance of deposit money banks in Nigeria.

H02: There is no significant impact of market risk management on the performance of deposit money banks in Nigeria.

H03: Liquidity risk management does not have significant effect on the performance of deposit money banks in Nigeria.

3.0 Methodology

The paper analyzes the effects of financial risk management on the profitability of deposit money banks using earnings per share as a proxy for banks' performance. The sample size consisted of all banks that are quoted on the Nigerian Stock Exchange. Based on this criteria, fifteen (15) out of nineteen (19) banks in Nigeria are used for the study. The data used for this study were secondary in nature implying that data were obtained from annual reports of all the quoted banks on the Nigerian Exchange Group, covering 2000 to 2022. EPS, as the main dependent variable, is determined by ratios of non-performing loans and loans and advances; loan loss provision and total assets; and loans and advances and total deposits, Interest Sensitivity ratio, foreign exchange risk. The study further includes market risk management variables and liquidity risk management variables such as interest sensitivity ratio; exchange rate; cash, deposit and bank size: The model is stated as:

$$EPS = f(CRM, MRM, LTM) \tag{1}$$

$$EPS_{it} = B_0 + B_1NPLLA_{it} + B_2LLPTA_{it} + B_3LATD_{it} + B_4TDLA_{it} + B_5INT_{it} + B_6FER_{it} + B_7CSH_{it} + B_8BKS_{it} + \mu_{it} \tag{2}$$

Where: B_0 = Constant term, μ_{it} = Error term. The A-priori expectation is: $\beta_1 > 0$; $\beta_2 > 0$ and $\beta_3 > 0$, supposing that there should be a positive relationship between credit risk management and bank performance in Nigeria. There should be a positive links between market risk management

and banks performance in Nigeria. There should be a positive relationship between liquidity risk management and banks performance in Nigeria. All variables are defined in Table 1.

The paper applies the Panel data approach. The research use techniques that account for both the variation across entities and overtime. One common method is the Fixed (Radom) Effects Model, which controls for time-invariant differences between entities by differencing (assumes that individual-specific effects are random and uncorrelated with the explanatory variables). We confirm the sensitivity of equation (2) to different performance measures. We estimate equations 2 using ROA and ROE, as shown in (3) and (4) respectively.

$$ROA_{it} = B_0 + B_1NPLLA_{it} + B_2LLPTA_{it} + B_3LATD_{it} + B_4TDLA_{it} B_5INT_{it} + B_6FER_{it} + B_7CSH_{it} + B_8BKS_{it} + \mu_{it} \tag{3}$$

$$ROE_{it} = B_0 + B_1NPLLA_{it} + B_2LLPTA_{it} + B_3LATD_{it} + B_4TDLA_{it} B_5INT_{it} + B_6FER_{it} + B_7CSH_{it} + B_8BKS_{it} + \mu_{it} \tag{4}$$

Table 1:
Description of Variables

Variables		Description
Dependent		
EPS	Earnings per share	EPS is calculated by dividing the net income of the company (after taxes and preferred dividends) by the weighted average number of outstanding shares of common stock.
ROE		ROE is the profit after tax divided by book value of equity. Tian and Zeitun (2007)
ROA		This is calculated by dividing earnings after interest and tax into total assets which is based on the study of Jiraporn and Liu (2008)
Independent		
CRM	Credit Risk Management	Cash ratio is measured as cash and cash equivalents to total assets. Banks with more cash and cash equivalents will have less exposure to liquidity risk, as these banks will have a body of cash to meet the liquidity demands of their customers (Alzhoubi, 2017)
NPLLA	Ratio of non-performing loans to loans and advances	This is captured by the ratio of non-performing loans to loans and advances
LLPTA	Ratio of loan loss provision to total assets	This measures the amount of funds a bank sets aside to cover potential loan losses as a percentage of its total assets. It indicates how well a bank is preparing for possible defaults on its loans relative to its overall asset base.
LATD	Ratio of loans and advances to total deposits	This compares the total amount of loans and advances a bank has issued to the total deposits it holds. It indicates the bank's lending activity relative to its deposit base, reflecting how much of the bank's deposits are being used to fund loans and advances.
TDLA	Ratio of total deposits to loans and advances	This compares the total amount of customer deposits held by a bank to the total amount of loans and advances it has issued. It is the

		proportion of the bank's deposits that are being used to fund its lending activities, providing insight into the bank's liquidity.
MRM	Market Risk Management	This involves identifying, assessing, and controlling the potential risks that arise from fluctuations in market variables such as interest rates, stock prices, exchange rates, and commodity prices, which can affect the financial performance of an institution.
INT	Interest Sensitivity Ratio	The study captured the effect of interest rates as a measure of market risk since a change in interest rate could lead to a mismatch between interest paid on deposit and the interest received on loans. It is measured by interest rate sensitivity assets divided by interest rate sensitivity liability
FER	Foreign Exchange Rate	Foreign exchange risk manifested by exposure, the degree to which a bank's performance is affected by exchange rate changes was measured using the ratio of net foreign currency exposure between assets and liabilities to total assets (Gietzen, 2017)
LRM	Liquidity Risk Management	Involves identifying, assessing, and mitigating the potential risks a financial institution faces in being unable to meet its short-term obligations due to insufficient liquid assets.
CSH	Cash divided by total asset	Represent a financial ratio that measures the proportion of a company's total assets that is held in cash or cash equivalents. It indicates how much liquidity a company has relative to its total assets, showing its ability to quickly access cash if needed.
BKS	Bank Size	Refers to the overall scale of a bank, typically measured by factors such as its total assets, market capitalization, or the volume of deposits and loans it manages.

Source: Author (2025)

4.0 Results

Descriptive statistics from Table 1 reveal substantial variability across the dataset. For instance, EPS has a mean of 5.439 but a large standard deviation of 20.659, highlighting considerable dispersion around the mean. Most variables show signs of non-normality, evident through extreme skewness and kurtosis values. Notably, variables like CASH and FER display extremely high kurtosis (59.239 and 52.608 respectively), indicating the presence of significant outliers or fat-tailed distributions. The Jarque-Bera test for all variables is highly significant (p-value = 0.0000), reinforcing the rejection of the null hypothesis of normal distribution.

The correlation matrix (Table 2) suggests low to moderate linear relationships among the independent variables, with no serious multicollinearity concerns. Notably, NPLLA and LLPTA are moderately positively correlated (0.54), which is expected given their shared focus on credit risk. The correlation analysis between EPS and the other variables reveals generally weak relationships, both positive and negative. For instance, the correlation between EPS and bank size (BKS) is very weak and negative, suggesting that larger banks do not necessarily exhibit higher profitability on a per-share basis in this dataset. Similarly, the relationship between EPS and cash to total assets (CASH) is also weakly negative, implying that higher liquidity in the form of cash holdings does not significantly affect earnings per share. Foreign exchange rate risk (FER) shows an even weaker negative correlation with EPS, indicating that fluctuations in the foreign exchange market have minimal impact on the banks' profitability. Interest rate sensitivity

(INT) also displays a very weak positive relationship with EPS, suggesting that sensitivity to interest rate changes has little to no effect on earnings.

In terms of credit risk measures, the correlation between EPS and the ratio of loan loss provisions to total assets is weakly negative, pointing to the fact that higher provisions for bad loans tend to be associated with lower profitability. Similarly, non-performing loans (NPLLA) show a weak negative correlation with EPS, indicating that a higher proportion of non-performing loans has only a slight negative impact on earnings. The correlation between EPS and the ratio of total deposits to total loans and advances is weakly positive, showing that this liquidity measure has a very minor influence on earnings performance. The weak correlations suggest that individual factors like credit risk management, market risk management, and liquidity do not strongly drive bank profitability in isolation. Rather, the complex interplay of these factors might be more effectively captured through multivariate models, such as the regression analysis, which can provide a clearer picture of how they influence earnings.

The Hausman test results (Table 3) support the random effects model, given the Chi-square statistic of 10.22 and an associated p-value of 0.2497, which is greater than the conventional 5% significance level. This implies that the individual-specific effects are uncorrelated with the regressors, making the random effects model more appropriate for efficient estimation. Nevertheless, both fixed and random effects estimation results are presented in Table 4 to provide a comparative understanding. The fixed effects results show that NPLLA and LLPTA have significant negative impacts on EPS, significant at 5% and 10% respectively, suggesting that a higher incidence of bad loans and greater loan loss provisions depress bank profitability. LATD and TDLA have significant positive effects, indicating that banks with a higher ratio of loans to deposits, and vice versa, are more profitable. FER exerts a highly significant negative influence on EPS at the 1% level, underlining the vulnerability of bank earnings to exchange rate volatility. The size of the bank positively influences EPS significantly, implying that larger banks enjoy economies of scale and better earnings performance.

In the random effects model, which is preferred based on the Hausman test, the general findings are consistent with those of the fixed effects model but show slightly stronger explanatory power, reflected by an R-squared value of 0.78 compared to 0.64 in the fixed effects model. In this specification, NPLLA remains negatively significant at the 10% level, LLPTA is negatively significant at the 5% level, while LATD and TDLA maintain their positive and significant influence. FER continues to demonstrate a strong negative impact on EPS at the 1% level. Interestingly, cash holdings and interest sensitivity (INT) remain statistically insignificant in both models, suggesting that, within the sample period and structure, liquidity in the form of cash and sensitivity to interest rate changes do not materially influence EPS outcomes.

Overall, the results emphasize the critical role of effective credit risk management, particularly the control of non-performing loans and provisioning practices, in enhancing bank profitability. Market risks, particularly foreign exchange exposure, also emerge as important factors adversely affecting earnings. Liquidity management, except for bank size, show weaker explanatory power. The significant positive impact of bank size suggests that larger institutions have better risk management capabilities or diversified operations that buffer against earnings volatility.

Table 1:
Descriptive Statistics

Variables	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
BKS	5.899	0.466	0.51	5.808	64.327	0.0000
CASH	0.135	0.144	6.166	59.239	23894.38	0.0000
EPS	5.439	20.659	6.173	45.285	13987.03	0.0000
FER	0.121	0.33	-4.263	52.608	18263.73	0.0000
INT	0.995	0.607	-2.305	9.592	466.379	0.0000
LATD	1.53	1.86E+09	13.012	170.543	207225.1	0.0000
LLPTA	5.604	9.834	2.666	11.765	758.82	0.0000
NPLLA	0.931	1.732	2.624	10.878	646.001	0.0000
ROA	0.016	0.046	-3.284	25.065	3820.612	0.0000
ROE	0.057	0.542	-2.509	25.383	3792.876	0.0000
TDLA	23.9	1.87	12.716	165.239	194396.6	0.0000

Source: Author (2025)

Table 2:
Correlation Coefficients

Correlation	BKS	CASH	EPS	FER	INT	LATD	LLPTA	NPLLA	TDLA
BKS	1.00								
CASH	0.06	1.00							
EPS	-0.08	-0.05	1.00						
FER	-0.03	0.02	-0.02	1.00					
INT	0.19	0.13	0.01	0.06	1.00				
LATD	0.09	-0.01	-0.02	-0.02	0.01	1.00			
LLPTA	0.26	0.00	-0.11	-0.09	0.15	0.04	1.00		
NPLLA	0.25	-0.01	-0.04	-0.15	0.20	-0.03	0.54	1.00	
ROA	0.24	0.00	-0.12	-0.03	0.01	0.04	0.06	0.04	
ROE	0.06	0.07	-0.07	-0.07	-0.02	0.02	0.07	0.07	
TDLA	0.04	-0.03	-0.03	0.03	0.02	-0.01	0.02	0.03	1.00

Source: Author (2025).

Table 3:
Result of Hausman Test

Model	Chi-Statistics	P-value
FIXEDEPS	10.22	0.2497

Table 4 Fixed and random effect estimation of EPS

Variables	Fixed effect	Random effect
Constant	5.54 (22.8)	17.5 (19.6)
NPLLA	-0.52** (0.16)	-0.25* (0.11)
LLPTA	-0.49* (0.22)	-0.60** (0.29)
LATD	1.03* (0.41)	1.32*** (0.35)
TDLA	1.68* (0.70)	1.65* (0.72)
INT	2.16 (3.88)	1.61 (2.51)
FER	-9.63*** (2.93)	-5.75*** (2.23)
CASH	-1.49 (5.20)	-2.12 (5.59)
BKS	2.63** (0.74)	2.16** (0.56)
R-Squared	0.64	0.78
F-statistics	5.028	19.02
Prob (F-statistics)	0.0043	0.0015

Note: *significant at 10% **significant at 5%, ***significant at 1%, Robust standard errors in parentheses

Source: Author (2025).

Sensitivity Analysis

We recall equation (3) and (4) to demonstrate the sensitivity analysis. The model considers demonstrate whether the effect of the measures of risk management, including Credit Risk Management (CRM), Market Risk Management (MRM), and Liquidity Risk Management (LTM), are sensitivity to the specific measure of performance applied. The result shows that the Hausman test results indicate that a fixed-effects model is more appropriate for ROA (p-value = 0.0027), whereas a random-effects model is suitable for ROE (p-value = 0.6025).

The regression results show that several variables significantly affect both ROA and ROE. Non-performing loans (NPLLA) have a significant negative impact on both ROA and ROE, indicating that higher levels of non-performing loans reduce bank performance. Loan loss provisions (LLPTA) also negatively affect ROA but positively affect ROE, suggesting that higher provisions decrease profitability but might indicate a more prudent approach, enhancing equity returns. The loans-to-deposits ratio (LATD) and total deposits-to-loans ratio (TDLA) have positive relationships with both ROA and ROE, highlighting the importance of efficient lending and deposit management in boosting bank performance. The interest sensitivity ratio (INT) has a positive effect on ROA but a negative effect on ROE, indicating that interest rate sensitivity might affect profitability differently than equity returns. The foreign exchange rate significantly negatively affects ROA, while its impact on ROE is more varied. The cash ratio (CSH) shows a negative relationship with ROA but a positive one with ROE, suggesting that while liquidity management might hurt short-term profitability, it could enhance long-term equity returns. Bank size has a positive effect on ROA and ROE, especially under random effects, suggesting that larger banks tend to perform better in terms of profitability and equity returns.

The models demonstrate good explanatory power, with R-squared values indicating that the fixed-effects model accounts for a substantial portion of the variance in both ROA and ROE. The statistical significance of the results, indicated by the F-statistics and corresponding p-values, suggests that the relationships between the risk management measures and bank performance are robust and significant. Clearly, the outcome is like the main analysis, thus, indicating the result is not sensitive to the measure of performance applied. The findings provide important implications for bank management and regulators: focusing on improving asset quality, managing exchange rate risks, and fostering bank growth could substantially enhance profitability.

Table 5: Hausman tests

Model	Chi-Statistics	P-value
FIXROA	23.56	0.0027
FIXROE	6.40	0.6025

Source: Author (2025)

Table 6: Fixed and Random Effect Regressions for ROA and ROE

Variables	Fixed Effect	Random effect	Fixed effect	Random effect
	ROA	ROA	ROE	ROE
CONSTANT	-0.042 (0.046)	-0.10 (0.057)	0.16 (0.46)	-0.42 (0.60)
NPLLA	-0.0053** (0.0017)	-0.0055* (0.0016)	-0.040*** (0.011)	-0.034*** (0.016)
LLPTA	-0.0055** (0.0012)	-0.0053** (0.0014)	0.045*** (0.012)	0.050*** (0.017)
LATD	.00051*** (0.00007)	0.0086*** (0.00028)	0.0054*** (0.0015)	0.0075*** (0.0020)
TDLA	0.0067** (0.0024)	0.0051** (0.0022)	0.0037* (0.016)	0.051* (0.020)
INT	0.00079*** (0.0017)	0.0057*** (0.0006)	-0.68** (0.26)	-0.34** (0.13)
FER	-0.025* (0.010)	-0.021** (0.008)	-0.035** (0.016)	-0.050* (0.015)
CASH	-0.013 (0.018)	-0.032** (0.009)	0.55* (0.22)	0.52* (0.24)
BKS	0.0069** (0.0026)	0.021 (0.0097)	0.0092*** (0.039)	0.098*** (0.038)
R-squared	0.69	0.85	0.78	0.86
F-statistics	13.30	51.07	3.17	45.82
Prob (F-statistics)	0.0000	0.0000	0.0012	0.0000

Note: *significant at 10%, **significant at 5%. Robust standard errors in parentheses
Source: Author (2025)

Discussions

The findings of this study align closely with prior research on the relationship between risk management practices and bank performance. Consistent with the results of Adeusi et al. (2013) and Kolapo et al. (2012), the study finds that higher credit risk, as measured by non-performing loans (NPLLA) and loan loss provisions (LLPTA), significantly reduces bank profitability indicators such as EPS, ROA, and ROE. This supports the view that effective credit risk management is critical for sustaining financial performance. Similarly, the positive influence of liquidity management proxies (LATD and TDLA) on EPS, ROA, and ROE is in agreement with the work of Bourke (1989) and Demirgüç-Kunt and Huizinga (1999), who highlighted that sound liquidity management enhances profitability by ensuring that banks can meet withdrawal

demands and fund profitable lending opportunities.

The negative impact of foreign exchange risk (FER) on bank performance found in this study also corroborates the findings of Sufian and Chong (2008), who reported that macroeconomic and exchange rate instability adversely affect banking sector performance. Interestingly, the study observed that interest rate sensitivity (INT) positively influences ROA but negatively affects ROE, indicating that market risk management has mixed effects depending on the profitability measure used. This nuanced finding is partly reflected in the study by Al-Tamimi and Al-Mazrooei (2007), who argued that while interest rate risk management can stabilize returns on assets, it may not always enhance shareholder returns.

Moreover, the positive and significant relationship between bank size (BKS) and performance metrics is consistent with the results reported by Athanoglou et al. (2008) and Goddard et al. (2004), who concluded that larger banks benefit from economies of scale, better diversification, and greater access to capital markets, leading to improved financial outcomes. Overall, this study strengthens the existing evidence that robust risk management practices are essential for enhancing bank profitability and shareholder value, while also highlighting specific areas - such as foreign exchange exposure - where risk remains a significant challenge.

The findings of this study are consistent with recent empirical research conducted between 2020 and 2025, which underscores the critical role of risk management in enhancing bank performance. For instance, Imeh et al. (2025) examined listed deposit money banks in Nigeria and found that effective credit risk management, particularly through controlling non-performing loans and maintaining adequate loan loss provisions, significantly improves profitability metrics such as Return on Assets (ROA) and Return on Equity (ROE). Similarly, Legass and Roba (2024) investigated Ethiopian commercial banks and reported that robust credit risk management practices positively influence financial performance, reinforcing the importance of prudent credit policies.

In the context of liquidity management, Alagbe et al. (2024) analyzed Nigerian deposit money banks and concluded that efficient liquidity management strategies, including optimal cash reserves and loan-to-deposit ratios, are positively correlated with enhanced profitability. This aligns with the current study's findings, which highlight the significance of liquidity ratios such as LATD and TDLA in driving financial performance.

Regarding market risk, Harb et al. (2023) explored banks in the MENA region and discovered that while credit risk management alone does not significantly affect accounting performance, the combined management of credit and liquidity risks yields substantial improvements in both accounting and market performance. This nuanced understanding of risk interplay complements the present study's observation that interest rate sensitivity (INT) has a positive effect on ROA but a negative impact on ROE, suggesting that market risk management outcomes may vary depending on the specific performance metric considered.

The findings of this study have several important policy implications for banking sector management and financial regulators. First, the significant negative relationship between non-performing loans (NPLLA), loan loss provisions (LLPTA), and earnings per share (EPS) highlights the need for stricter credit risk management frameworks. Banks should adopt more rigorous credit assessment procedures, enhance borrower monitoring, and implement early

warning systems to reduce the incidence of bad loans. Regulators, in turn, should enforce tighter supervisory standards and require higher provisioning for non-performing assets to maintain financial system stability. Second, given the positive impact of loans-to-deposit ratios (LATD and TDLA) on profitability, policies encouraging efficient intermediation between deposit mobilization and credit extension should be promoted. Banks should be incentivized to prudently expand their lending activities while maintaining healthy deposit bases.

Third, the strong negative effect of foreign exchange risk (FER) on earnings calls for better currency risk management practices. Banks should strengthen their foreign exchange risk hedging mechanisms, and regulators may consider setting limits on foreign currency exposures relative to total assets. Fourth, although liquidity in terms of cash holdings did not significantly influence EPS, the positive impact of bank size suggests that encouraging consolidation in the banking sector could enhance resilience and profitability. Policymakers should thus support mergers and acquisitions that strengthen banks' capital bases and operational efficiencies. Overall, a balanced focus on improving credit quality, managing market risks, optimizing liquidity usage, and supporting bank growth would be essential in enhancing bank profitability and ensuring long-term financial sector stability.

5.0 Conclusions

The study explored the impact of credit risk management, market risk management, and liquidity management on the earnings performance of banks, using Earnings per Share (EPS) as the key indicator. The empirical analysis, supported by both fixed and random effects models, revealed several significant relationships. Credit risk factors, particularly the ratio of non-performing loans to loans and advances (NPLLA) and the ratio of loan loss provisions to total assets (LLPTA), demonstrated a consistent negative impact on EPS. This finding underscores the critical importance of effective credit risk assessment and management in sustaining bank profitability. Banks with weaker loan portfolios and higher provisioning needs are more likely to experience depressed earnings, highlighting the need for early detection of credit deterioration and proactive risk mitigation strategies.

Moreover, the study found that efficient financial intermediation, captured by the ratios of loans to deposits (LATD and TDLA), contributes positively to earnings. This indicates that banks that can effectively mobilize deposits and convert them into quality lending opportunities are better positioned to generate higher returns. However, the adverse effect of foreign exchange risk (FER) on EPS points to the vulnerabilities that banks face in volatile external environments. It suggests a pressing need for robust foreign exchange risk management frameworks, particularly in economies exposed to currency fluctuations. Interestingly, liquidity management indicators, specifically the cash to total assets ratio (CSH), were not significant determinants of EPS, implying that mere liquidity holdings without strategic deployment do not necessarily translate into better earnings performance. On the other hand, bank size (BKS) exhibited a positive and significant influence on EPS, affirming that larger banks benefit from economies of scale, better diversification, and potentially stronger operational efficiency.

Overall, the study concludes that while efficient liquidity and market risk management are important, credit risk management remains the cornerstone of bank profitability. Furthermore, banks must balance growth with quality, ensuring that expansion does not compromise asset quality or expose them excessively to market volatility. These results carry important

implications for bank managers and policymakers, emphasizing the need for a holistic risk management approach that integrates credit quality control, market risk mitigation, and strategic liquidity deployment. Strengthening regulatory oversight, encouraging best practices in risk management, and promoting consolidation among banks could lead to a more stable and profitable banking sector. Future research could expand on these findings by examining the moderating effects of macroeconomic factors or exploring comparative studies across different banking systems.

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