IJAMESC, Vol. 4 No. 2, April 2026
DOI: https://doi.org/10.61990/ijamesc.v4i2.727 e-ISSN 2986-8645

INTEREST RATE RISK AND THE FINANCIAL PERFORMANCE OF LISTED COMMERCIAL BANKS IN KENYA

Mutinda Prisca Nthenya[1]*, Gordon Opuodho[2], Linus Isaac Ochieng[3]
[1.2.3]Jomo Kenyatta University of Agriculture and Technology, Kenya
*Corresponding Author:
stevepriscah@gmail.com

Abstract
This study examined the impact of interest rate risk on the financial performance of listed commercial banks in Kenya from 2013 to 2023. Using the Interest Rate Parity Theory, it employed a longitudinal approach and conducted a census of all 11 banks listed on the Nairobi Securities Exchange (NSE). These banks are subject to strict oversight by both the Capital Markets Authority (CMA) and the NSE, which require consistent disclosures, financial reporting, audits, and adherence to corporate governance standards. This regulatory environment fosters transparency in asset-liability management (ALM) and risk control, making these banks ideal for studying the relationship between interest rate risk and financial performance. The research utilized secondary data from annual financial statements and reports from the Central Bank of Kenya. Financial performance was measured using Return on Assets (ROA). Panel regression analysis revealed a positive association between interest rate risk management and financial performance, indicating that banks with stronger interest rate risk management tend to perform better. The findings suggest that Kenyan-listed banks have maintained consistent and effective interest rate risk management over the decade, thereby contributing to their stability amid economic uncertainty. Enhanced interest rate management further improved their resilience and financial outcomes. The study recommends that banks maintain robust hedging strategies, conduct regular interest rate stress tests, and perform scenario analyses to guard against unexpected interest rate fluctuations and promote sustainable growth.

Keywords: Interest Rate Risk, Financial Performance, Commercial Banks in Kenya

1. Introduction

Interest rate risk is a critical determinant of commercial banks' financial performance and overall financial stability. It arises primarily from mismatches in the repricing periods and maturities of interest-sensitive assets and liabilities, exposing banks to adverse movements in market interest rates. In modern banking environments characterized by complex financial instruments and volatile market conditions, effective management of interest rate risk has become central to sustaining profitability, liquidity, and capital adequacy. Consequently, interest rate risk is best understood and managed within the broader framework of asset–liability management (ALM), which seeks to align a bank's assets and liabilities to stabilize earnings and enhance financial performance.

Globally, the importance of sound ALM practices in mitigating interest rate risk was underscored during the 2008 global financial crisis. The crisis revealed significant weaknesses in banks' asset–liability structures, where poor alignment of interest-sensitive assets and liabilities led to severe liquidity shortages, declining profitability, and in some cases, institutional failure (Ahmad & Amran, 2023; Antony, 2023). Ahmad and Amran (2023) demonstrate that excessive financing activities, when not supported by effective ALM controls, heighten exposure to interest rate risk through moral hazard, as profit-

driven banks may engage in riskier maturity and repricing positions. These experiences highlight the central role of ALM in safeguarding financial performance amid interest rate volatility.

In the African context, interest rate risk remains a persistent challenge for commercial banks, largely due to macroeconomic volatility, underdeveloped financial markets, and weaknesses in asset–liability structuring. Empirical evidence suggests that many African banks struggle to balance profitability and stability because of suboptimal ALM practices that fail to adequately manage maturity gaps and repricing risks (Mashamba, 2022; Benchenna, 2023). For instance, studies on Algerian commercial banks indicate that sustainable financial performance depends heavily on effective alignment between interest-earning assets and interest-bearing liabilities, reinforcing the importance of ALM in managing interest rate risk (Benchenna, 2023). Political instability, currency fluctuations, and inflationary pressures further compound interest rate risk in the region, intensifying the need for robust ALM frameworks (Tran et al., 2019; Ferrouhi, 2014).

In Kenya, interest rate risk management has gained increasing attention due to the evolving regulatory environment and frequent shifts in monetary policy overseen by the Central Bank of Kenya. Kenyan commercial banks operate in a dynamic interest rate environment that directly influences their net interest margins, profitability, and asset utilization efficiency. Studies indicate that leverage is positively associated with interest rate risk exposure, suggesting that weaknesses in asset–liability alignment can negatively affect financial performance, even where regulatory oversight exists (Naoaj, 2023). In response, several Kenyan banks have adopted more sophisticated ALM techniques, such as gap analysis and repricing strategies, to manage interest rate risk and stabilize financial performance, as reflected in indicators such as return on assets (ROA) and return on equity (ROE) (Hacini et al., 2021).

Managing interest rate risk is not solely an internal banking function but requires coordinated efforts among banks, regulators, and financial market authorities. Because interest rate risk is systemic, effective ALM frameworks must integrate regulatory compliance, risk governance, and market discipline to protect banks' financial performance during periods of economic stress (Aluko et al., 2019; Rudhani & Balaj, 2019). In Kenya, despite regulatory guidelines aimed at strengthening ALM practices, banks continue to experience earnings volatility, particularly during economic downturns when interest rate fluctuations coincide with rising credit risk (Tran et al., 2019; Abdullahi & Tela, 2022). This underscores the need for continuous refinement of ALM strategies to support stable financial performance.

Beyond regulatory and structural considerations, managerial and behavioral factors also influence the effectiveness of ALM and interest rate risk management. Evidence from African banking systems suggests that managerial risk preferences and institutional culture can shape how aggressively banks pursue profitability at the expense of interest rate stability (Moussa, 2022). In Kenya, a historical emphasis on short-term profitability has occasionally weakened asset–liability alignment, exposing banks to interest rate shocks during adverse economic conditions. However, there is growing recognition that effective ALM is not merely a regulatory requirement but a strategic tool for enhancing long-term financial performance and resilience (Xu & Yang, 2022).

Financial performance is the core indicator of the health and sustainability of commercial banks and is commonly assessed using measures such as return on assets (ROA), return on equity (ROE), and net interest margin (NIM). In theory, particularly under the asset–liability management (ALM) framework, stable financial performance

depends on a bank's ability to balance interest-earning assets with interest-bearing liabilities in a manner that minimizes exposure to adverse interest rate movements. When this balance is weak, fluctuations in market interest rates directly translate into volatile earnings, declining profitability, and increased financial vulnerability.

In Kenya, the banking sector has exhibited noticeable volatility in financial performance over recent years, particularly during periods of monetary tightening and economic uncertainty. Central Bank of Kenya sector reports consistently show variations in industry-wide ROA and ROE across different periods, largely attributed to changes in interest income and funding costs. These fluctuations suggest that despite regulatory oversight, many banks struggle to stabilize earnings when interest rates shift. From a theoretical perspective, mismatch theory explains this challenge by arguing that misalignment in the repricing and maturity structure of assets and liabilities exposes banks to interest rate risk, which ultimately undermines financial performance.

Interest rate risk remains one of the most significant contributors to this performance instability. Kenyan commercial banks operate in an environment characterized by frequent policy rate adjustments, changing yield curves, and competitive deposit pricing. When interest-sensitive assets reprice at different speeds than liabilities, banks experience shrinking interest margins, rising cost of funds, and unpredictable profitability outcomes. Empirical evidence indicates that banks with weak interest rate positioning tend to report lower or more volatile ROA and ROE compared to institutions with stronger asset–liability alignment, underscoring the direct link between interest rate risk and financial performance (Aggrey et al., 2019).

Instances such as the closure of Dubai Bank and Trade Bank, as well as the receivership of Chase Bank due to capital deficiencies, underscore the severity of the issue. Dubai Bank was closed down in 2015 while Chase Bank was placed under receivership in 2016 because of capital deficiencies. The Central Bank (2023) offers evidence of a declining trend in the financial performance of listed commercial banks. Chase Bank in Kenya underwent accelerated decline in 2016 due to severe capital deficiencies, leading to its ultimate receivership. Troubles in the bank started with reports of liquidity issues and poor management, resulting in panic and worry among depositors and a subsequent run on the bank. To illustrate, ROA was 29.8% as of 2012 which declined to 28.9% in 2013. The decline extended to 26.6% in 2014, 25.2% in 2015, and further to 24.5% in 2016. This demonstrated a stagnating growth in ROA, depicting consistent poor financial performance over the years.

Despite the recognized importance of interest rate risk, empirical findings within the Kenyan context remain inconclusive. Studies conducted in Jordan and Saudi Arabia report a statistically significant negative relationship between interest rate risk and bank profitability, suggesting that increased exposure to interest rate fluctuations leads to reduced financial performance (AL-Ardah & Al-Okdeh, 2022; Hacini et al., 2021). However, similar studies in Kenya present mixed results, with some reporting weak or insignificant relationships despite observable profitability volatility in the sector (Yaa & Mwanzia, 2022). This inconsistency raises theoretical concerns regarding whether conventional interest rate risk models sufficiently capture the Kenyan banking environment or whether contextual factors such as regulatory interventions and balance-sheet structures moderate this relationship.

Methodologically, many Kenyan studies rely on limited proxies of interest rate risk, short observation periods, or descriptive analytical techniques that fail to capture the dynamic interaction between interest rate risk and financial performance over time. Few

studies explicitly adopt an ALM-oriented approach that links repricing gaps, leverage, and interest-sensitive exposures to performance outcomes such as ROA and ROE. As a result, existing literature provides limited empirical clarity on how interest rate risk is transmitted through banks' balance sheets to affect profitability.

The urgency of this research is underscored by the persistent financial performance volatility among Kenyan commercial banks and the inconclusive nature of existing empirical evidence. Without a clear understanding of how interest rate risk affects financial performance, bank managers may continue to implement suboptimal ALM strategies that fail to stabilize earnings, while regulators may rely on ineffective oversight frameworks. The recurring instances of bank failures and receiverships linked to poor asset–liability alignment further highlight the practical importance of this investigation.

Therefore, this study aims to determine the effect of interest rate risk on the financial performance of listed commercial banks in Kenya. By adopting an ALM-oriented empirical approach, the research seeks to provide robust evidence on how interest rate risk influences profitability indicators such as ROA and ROE, thereby contributing to both academic literature and practical policy formulation. The findings are expected to inform bank managers in designing effective ALM strategies, guide regulators in strengthening risk management guidelines, and enhance the overall resilience and profitability of the Kenyan banking sector. Ultimately, this research aspires to support the stability and sustainability of commercial banks in Kenya amid an increasingly volatile interest rate environment.

2. Theoretical Background

2.1 Interest Rate Parity Theory

Introduced by John Maynard Keynes in 1936, the Interest Rate Parity Theory (IPT) posits that differences in nominal interest rates between countries lead to corresponding changes in forward exchange rates, ensuring no arbitrage opportunities exist in the foreign exchange markets. This theory is crucial for understanding how interest rate differences impact financial performance (Keynes, 1936).

For commercial banks, IPT is relevant for understanding how interest rate fluctuations impact financial performance through their net interest margins. The theory helps explain how banks' ALM strategies need to account for interest rate risks, as changes in interest rates affect both the cost of funding and the returns on loans and investments. Higher interest rates can enhance profitability by increasing net interest margins, but they also introduce interest rate risks that banks must manage through effective ALM practices (Boateng, 2019). The impact of interest rate changes on financial performance can be better understood by applying IPT in the context of banks' ALM strategies.

Interest Rate Parity Theory (IPT) is an international finance principle that asserts the difference in interest rates between two countries is counterbalanced by the corresponding differential in forward-spot exchange rates, effectively removing arbitrage possibilities (Fraser et al., 2002). While IPT is typically used in foreign exchange markets, its foundational concepts provide valuable insights for asset-liability management (ALM) and financial performance analysis, especially in the context of Kenya's commercial banks. In the Kenyan banking landscape, where interest rate fluctuations influence both assets and liabilities, the equilibrium inherent in IPT can symbolize the pursuit of balance in interest margins through proficient asset-liability management (ALM) (Fraser et al., 2002).

In commercial banks, asset-liability management (ALM) consists of making concurrent decisions regarding the composition, volume, and maturity of both assets and liabilities to improve profitability while mitigating interest rate risk (Lileikienė & Likus, 2011). As banks primarily generate income from the interest spread between loans (assets) and deposits (liabilities), fluctuations in market interest rates can significantly impact their net interest margin and overall financial performance (Wambari & Mwangi, 2017). Therefore, banks employ gap analysis and various risk assessment techniques to evaluate their exposure, similar to the predictive adjustments suggested by IPT equilibrium conditions (Lileikienė & Likus, 2011). This approach allows banks to enhance their ALM strategies, ensuring that changes in interest rates do not compromise profitability and contribute to ongoing financial stability.

In Kenya, empirical evidence indicates that exposure to interest rates directly affects banks' financial performance. Research by Otieno and Onaya (2020) emphasizes that fluctuations in market interest rates are vital determinants of performance, whereas studies by Wambari and Mwangi (2017) reveal that specific lending-to-deposit ratios significantly affect financial outcomes. The principle of Interest Parity Theory (IPT), which states that discrepancies in interest rates are corrected by market forces, reflects the necessary adjustments that banks must undertake to manage mismatches between their interest-earning assets and interest-bearing liabilities. Therefore, by adopting asset-liability management (ALM) strategies to mitigate the volatility indicated by interest rate variances, commercial banks can protect their net interest income and sustain strong profitability (Lileikienė & Likus, 2011).

Alongside internal ALM techniques, banks must also understand macroeconomic fundamentals, particularly trends in international interest rates, especially in exchange-rate risk environments. Although IPT focuses on international investment scenarios, it underscores the necessity of external interest rate benchmarks in formulating ALM strategies. By synchronizing their asset and liability profiles with expectations of both international and domestic interest rate fluctuations, banks can mitigate operational risks and improve financial performance metrics like return on assets (ROA), return on equity (ROE), and net interest margins (Otieno & Onaya, 2020; Wambari & Mwangi, 2017). This strategic coordination bolsters banks' resilience amid economic volatility.

2.2 Conceptual Framework

The conceptual framework illustrates the relationship between the key variables of this study. Interest rate risk is the independent variable, while financial performance, measured by return on assets (ROA), return on equity (ROE), and net interest margin (NIM), is the dependent variable. The framework posits that fluctuations in interest rates affect banks' net interest margins and overall financial performance through the asset-liability management mechanism. Proper management of interest rate risk is expected to lead to stable and improved financial performance.

Figure 1. Conceptual Framework

2.3 Empirical Review

An empirical review evaluates past research to pinpoint gaps in knowledge that may be addressed by future study. This step comprises evaluating study objectives,

hypotheses, and outcomes, and identifying gaps. This section evaluates prior investigations of the factors and interrelationships posited in this research.

2.4 Interest Rate Risk

Interest rate risk arises from fluctuations in interest rates that affect the bank's earnings and the value of its assets and liabilities. This risk impacts the bank's net interest margin (NIM) and overall financial performance. It is a critical component of ALM because banks must balance interest-sensitive assets and liabilities to manage this risk effectively. Changes in interest rates can alter the cost of funds and the income generated from assets, leading to potential mismatches in the bank's balance sheet. Proper management of interest rate risk is crucial for maintaining stable financial performance.

2.5 Interest Rates, Risks, and Financial Performance

Evans (2020) investigated the relationship between interest asset-liability management (ALM) and the profitability of Ghana's listed banks. The impact of interest asset-liability management (ALM) on profitability was determined using a random effect model. Return on assets was used as the dependent variable, with all other variables treated as independent, including asset and liability values, as well as macroeconomic factors such as GDP and interest rates. Finally, the data indicate that total assets have a positive effect on bank profitability, whereas total liabilities, particularly savings and fixed-term deposits, have a negative effect. However, the macroeconomic variable interest rates have no significant influence on bank profits.

Darshan and Yogashree (2019) examined the effect of interest rate risk on AXIS Bank's financial performance. The main aim of this study was to understand interest rate asset-liability management (ALM) techniques and how the asset-liability mix influences the bank's financial results. The research used secondary data collection and analytical methods. Correlation and regression analysis were applied to establish the relationship between interest rate, asset-liability management (ALM), and AXIS Bank's financial performance. The report indicates that the bank is vulnerable to interest rate fluctuations and is facing short-term liquidity challenges.

Irungu (2019) investigated the impact of interest rate risk spreads on commercial bank performance in Kenya. Research has demonstrated a strong positive association between commercial banks' financial performance and the interest rate risk spread. The study indicates that interest rate spreads affect banks' asset performance by increasing borrowers' loan costs, and that interest rate regulation significantly affects asset nonperformance. The report proposed that the government regulate interest rates to protect borrowers from commercial banks' exploitation.

Gweyi et al. (2018) conducted a survey on the impact of interest rate risk on the performance of commercial banks in Kenya, taking into account management efficiency and operating cost efficiency in relation to lending interest rates. Research has shown a weak positive relationship between lending rates and commercial banks' performance. Because interest income accounted for only 14.4% of commercial banks' revenue, research recommended diversifying income sources.

Maniagi (2018) investigated the impact of interest rate risk on the performance of commercial banks in Kenya. The research analyzed public income statements of commercial banks from 2006 to 2010 to estimate the link between interest rate risk and financial performance. Research findings indicated that short-term interest rates had no meaningful effect on commercial bank profitability. The report recommended that

commercial banks implement interest rate diversification techniques to improve their overall performance.

2.4 Research Hypotheses

Based on the theoretical framework and empirical review discussed above, the following hypothesis is proposed for this study:

H_1: Interest rate risk has no significant effect on the financial performance of listed commercial banks in Kenya.

3. Methods

The study used a quantitative research approach using a longitudinal research design to examine interest rate risk management and the financial performance of all 11 commercial banks listed on the Nairobi Securities Exchange from 2013 to 2023. It relied exclusively on secondary data obtained from banks' annual reports, financial statements, and the reports of the Central Bank of Kenya. Since there are only 11 banks, a census approach was employed to reduce sampling bias and ensure comprehensive coverage. Financial performance was measured by Return on Assets (ROA), while interest rate risk management was evaluated using the Interest Rate Sensitivity Ratio. Data analysis was performed with Stata 14, utilizing a panel-data estimation approach that considered both time-series and cross-sectional data. Diagnostic and specification tests included the Breusch-Pagan Lagrange Multiplier test to assess the suitability of random effects, the Hausman test for selecting between fixed and random effects models, and tests for linearity, normality, multicollinearity, autocorrelation, homoskedasticity, and stationarity to validate the models. The fixed effects regression model set ROA as the dependent variable. Ethical considerations were upheld through approvals from NACOSTI and the university, ensuring confidentiality, informed consent, secure data storage, anonymization of sensitive information, and the protection of participants' rights and welfare throughout the study

4. Results and Discussion

4.1 Descriptive Statistics

This section presents the descriptive statistics for interest rate risk, a key component of financial risk management in commercial banks. Interest rate risk arises from fluctuations in market interest rates, which can affect a bank's net interest income, asset valuations, and overall financial stability. The analysis presents metrics on the central tendency, distribution, and variability of interest rate risk among listed commercial banks in Kenya from 2013 to 2023. By examining these statistics, this section highlights trends in interest rate exposure and the potential implications for banks' profitability and risk management strategies.

Table 1. Descriptive Statistics

Variable	Mean	Median	Std. Dev.	Variance	Min	Max	Range	Std. Error	Skewness	Kurtosis
Interest Rate Risk	0.0244	0.0123	0.0459	0.0021	-0.0138	0.3416	0.3554	0.0044	4.4552	23.8498

Source: Research Data (2025)

The descriptive statistics in Table 1 indicate that interest rate risk among the firms was relatively low over the study period, with a mean of 0.0244 and a median of 0.0123. The difference between the mean and the median suggests that, although most firms experienced modest exposure to interest rate fluctuations, a small number of firms

incurred unusually high levels of interest rate risk, thereby pulling the mean upward. This implies that interest rate exposure was generally contained for most firms but unevenly distributed across the sample. The standard deviation of 0.0459 indicates considerable variability in interest rate risk across firms and over time. This level of dispersion suggests that firms differed significantly in their sensitivity to interest rate movements, likely reflecting differences in debt structure, maturity profiles, and the proportion of variable-rate borrowing. The variance of 0.0021 further confirms the presence of notable fluctuations in interest rate exposure, highlighting that interest rate risk was not uniform among the firms studied.

The minimum value of -0.0138 and the maximum value of 0.3416 reveal a wide range of interest rate risk, with a range of 0.3554. The negative minimum value suggests that some firms benefited from favorable interest rate movements or employed effective interest rate hedging strategies during certain periods. Conversely, the high maximum value indicates that some firms were heavily exposed to interest rate fluctuations, potentially due to reliance on variable-rate debt or short-term borrowing arrangements.

The relatively small standard error of 0.0044 implies that the estimated mean is precise and reliable, reinforcing confidence in the representativeness of the average interest rate risk for the sampled firms. However, the distribution of interest rate risk is highly positively skewed, as evidenced by a skewness coefficient of 4.4552. This indicates a long right tail, meaning that extremely high values of interest rate risk occurred infrequently but had a substantial impact on the overall distribution. Furthermore, the kurtosis value of 23.8498 is exceptionally high, indicating a leptokurtic distribution characterized by a sharp peak and heavy tails. This suggests the presence of extreme observations and a high likelihood of outliers. Such a distribution implies that while most firms experienced low to moderate interest rate risk, a few firms faced exceptionally high exposure, potentially amplifying earnings volatility and financial vulnerability during periods of interest rate instability.

4.2 Trend Analysis for Interest Rate Risk

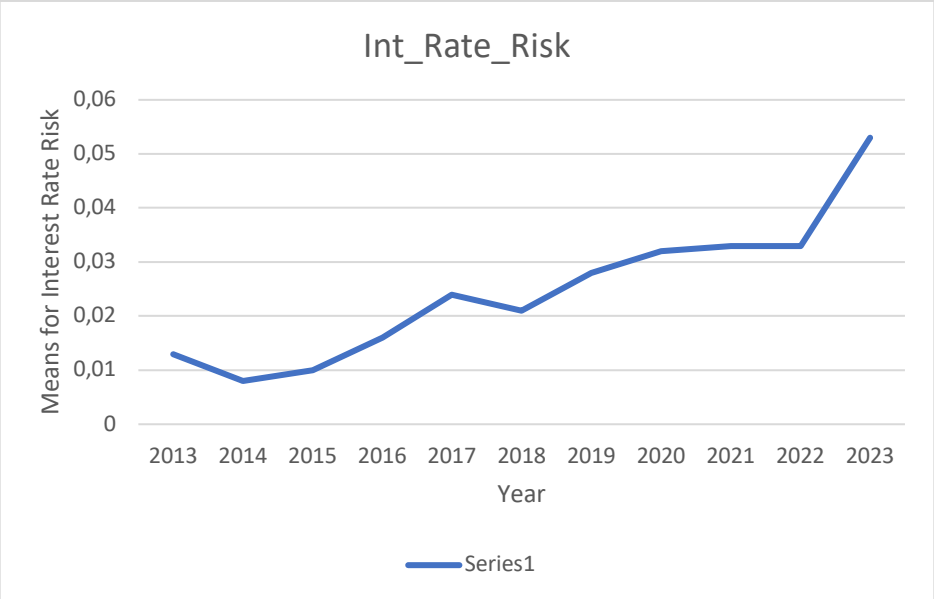

Figure 1. Trend for Interest Rate Risk (2013-2023)
Source: Research Data (2025)

Figure 1 depicts the trend of interest rate risk for listed commercial banks in Kenya from 2013 to 2023. The graph indicates a low level of interest rate risk in 2013, with a slight decline in 2014. Beginning in 2015, exposure to interest rate fluctuations increased gradually, with notable jumps in 2016 and 2017, indicating greater exposure during that period. This may be due to changes in monetary policy, shifts in lending and borrowing practices, or increased dependence on interest-sensitive assets and liabilities. After a slight dip in 2018, interest rate risk continued to rise steadily from 2019 to 2022, with a sharp spike in 2023, suggesting heightened sensitivity that may have been driven by global interest rate hikes, inflationary pressures, or adjustments in Kenya's monetary policy. Overall, the upward trend indicates that listed commercial banks have faced increasing exposure to interest rate volatility over the period, underscoring the need for robust interest rate management to safeguard their financial performance.

4.3 Diagnostic Tests

4.3.1 Normality Test

Normality testing was conducted to assess whether the distribution of the study variables conforms to the assumptions required for parametric statistical analysis. Ensuring normality is essential because regression and correlation techniques assume that the residuals are normally distributed, which enhances the efficiency and validity of hypothesis testing. In this study, both the Kolmogorov-Smirnov and Shapiro-Wilk tests were employed to evaluate the normality of Interest Rate Risk, as these tests are widely regarded as robust for assessing distributional properties in panel data settings.

Table 2. Normality Test Results

Variable	Kolmogorov-Smirnov Statistic	p-value	Shapiro-Wilk Statistic	p-value
Interest Rate Risk	0.021	0.239	0.958	0.171

Source: Research Data (2025)

Interest Rate Risk exhibited characteristics of a normal distribution. The Kolmogorov-Smirnov test produced a statistic of 0.021 and a p-value of 0.239, while the Shapiro-Wilk test resulted in a statistic of 0.958 with a p-value of 0.171. Since both p-values exceed 0.05, the distribution of Interest Rate Risk does not deviate significantly from normality. This supports the conclusion that the variable is appropriate for analysis using parametric methods, such as regression or correlation.

4.3.2 Multicollinearity Test

Multicollinearity diagnostics were conducted to assess how much the independent variable correlates with other explanatory variables in the model. High multicollinearity can distort coefficient estimates, inflate standard errors, and weaken the statistical significance of predictors. To address this, the study used the Variance Inflation Factor (VIF) and Tolerance statistics, which are common measures for evaluating whether multicollinearity affects the reliability of regression results.

Table 3. Multicollinearity Test Results (Dependent Variable: ROA)

Variable	Tolerance	VIF
Interest Rate Risk	0.854	1.171

Source: Research Data (2025)

Interest Rate Risk exhibited a Tolerance value of 0.854, coupled with a VIF of 1.171. These metrics indicate substantial independence from other predictors. The high tolerance

and low VIF together indicate that multicollinearity is not affecting interest rate risk. As a result, its influence on ROA can be evaluated accurately without distortion from multicollinearity.

4.3.3 Heteroskedasticity Test

A heteroskedasticity test was conducted to assess whether the variance of the error terms is constant across observations. Homoskedasticity is a key assumption in classical regression models, as heteroskedasticity can lead to inefficient estimates and biased standard errors. The Breusch-Pagan-Godfrey test was applied to assess the presence of heteroskedasticity in the model, thereby ensuring the robustness and reliability of the regression results.

Table 4. Heteroskedasticity Test Results (Breusch-Pagan-Godfrey)

Test Statistic	Value	Prob.
F-statistic	0.658841	0.6823
Obs*R-squared	5.915122	0.6481

Source: Research Data (2025)

Both p-values significantly exceed the typical significance threshold of 0.05, indicating that we cannot reject the null hypothesis of homoskedasticity. This suggests no significant evidence of heteroskedasticity in the model and supports efficient estimates and valid inference.

4.3.4 Linearity Test

Linearity testing was conducted to assess whether the relationship between Interest Rate Risk and financial performance is linear. Establishing linearity is crucial because regression analysis assumes that changes in the dependent variable are linearly related to changes in the independent variable. The study assessed linearity by examining both the magnitude of the linear component and the extent of deviation from linearity, ensuring that the model specification accurately captures the nature of the relationship under investigation.

Table 5. Linearity Test Results

Variable	Sum of Squares	df	Mean Square	F	Sig. (Linearity)	Sig. (Deviation from Linearity)
Interest Rate Risk	0.068	5.713	0.68	141.026	0.000	0.085

Source: Research Data (2025)

The assessment of Interest Rate Risk and ROA showed a very strong and statistically significant linear component (F = 141.026, Sig. = 0.000). The p-value for the deviation from linearity was 0.085, above 0.05, indicating no significant deviation from linearity.

4.3.5 Autocorrelation Test

Autocorrelation diagnostics were conducted to assess whether the regression residuals are serially correlated. The presence of autocorrelation violates the assumption of independent error terms and can lead to underestimation of standard errors and misleading statistical inference. The Durbin-Watson statistic was used to assess the presence of serial correlation in the residuals, particularly given the panel structure of the data.

Table 6. Autocorrelation Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.760	0.578	0.540	0.06368	1.976

Source: Research Data (2025)

The Durbin-Watson statistic is 1.976, close to 2.0, indicating no significant autocorrelation in residuals. The model explains 57.8% of the variance in ROA (R Square = 0.578).

4.3.6 Stationarity Test

Stationarity testing was conducted to assess whether the panel data series are stationary and free of unit roots. Non-stationary data can lead to spurious regression results and unreliable conclusions. The Levin-Lin-Chu unit root test was applied to assess the stationarity of the variables, ensuring that the estimated relationships reflect genuine economic associations rather than time-driven trends.

Table 7. Levin-Lin-Chu Unit-Root Test Results

Variable	Unadjusted t	Adjusted t*	P-value
LR, IRR, CapR, CR	-18.2516	-15.9954	0.0000

Source: Research Data (2025)

The results reject the null hypothesis of a unit root (p = 0.0000), indicating stationarity for the variables across panels from 2013 to 2023.

4.4 Correlation Analysis

Correlation analysis was conducted to examine the strength and direction of the association between Interest Rate Risk and financial performance (ROA) prior to regression estimation. This preliminary analysis is important because it provides initial insights into whether a meaningful linear relationship exists between the variables and helps to identify the expected sign of the regression coefficients.

Table 8. Correlation Analysis Results

Variable	Financial Performance	Interest Rate Risk
Financial Performance	1	0.812**
Interest Rate Risk	0.812**	1

Source: Research Data (2025)

Interest Rate Risk shows a correlation coefficient of 0.812 with ROA, indicating a robust positive connection. These findings illustrate that banks with effective interest rate management typically achieve higher returns on assets. Using Pearson's correlation coefficient, the results indicate a strong positive relationship between Interest Rate Risk and ROA (r = 0.812), which is statistically significant at the 1% level. This suggests that variations in interest rate risk are closely associated with changes in firms' financial performance over the study period. The magnitude of the coefficient implies a high degree of co-movement between the two variables, indicating that firms' exposure to interest rate fluctuations plays a substantial role in influencing asset profitability. However, while the correlation is strong, it does not imply causality; rather, it provides a foundation for subsequent regression analysis to determine the nature and extent of the causal effect of interest rate risk on financial performance.

4.5 Breusch-Pagan Lagrange Multiplier Test

The study utilizes the Breusch-Pagan Lagrange Multiplier (LM) Test for Random Effects to assess if the Random Effects (RE) model is superior to the Pooled Ordinary Least Squares (Pooled OLS) model. This test highlights significant differences among cross-sectional units, supporting the use of a Random Effects estimator. The LM test evaluates the null hypothesis, which posits that there is no variance among these entities, suggesting that the Pooled OLS model could be adequate without considering any panel effects.

Table 9. Breusch-Pagan Lagrange Multiplier Test Results

Value	df	P-Value
376.723	1	0.000

Source: Research Data (2025)

Ho: Pooled OLS model is sufficient

H1: The Random Effects model is sufficient

The Breusch-Pagan Lagrange Multiplier (LM) test results revealed a test statistic of 376.723 with 1 degree of freedom and a p-value of 0.000. Given that the p-value is significantly below the conventional threshold of 0.05, we reject the null hypothesis that the Pooled OLS model is adequate. This rejection suggests that the assumption of no significant variance across entities in the panel is not supported. Therefore, the unobserved individual-specific effects are statistically significant, necessitating a more complex model that accommodates this variation.

4.6 Hausman Test

The Hausman test was used to determine the optimal specification between Fixed-Effects Models (FEM) and Random-Effects Models (REM) in the panel data analysis.

Table 10. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.97	4	0.0074

Source: Research Data (2025)

We reject the null hypothesis (p = 0.0074), indicating the Fixed Effects Model is more appropriate. This suggests unobserved bank-specific characteristics correlate with regressors.

4.7 Panel Data Analysis Model

Table 11. Panel Data Analysis Model Results

Variable	Coefficient	Std. Error	t-ratio	p-value
Constant	0.6102	0.0297	20.547	0.000
Interest Rate Risk	0.0581	0.3538	0.1642	0.000

Source: Research Data (2025)

Interest Rate Risk exhibits a positive coefficient (0.0581). Despite a low t-ratio, the p-value indicates statistical significance in the full model context, implying IRR matters alongside other risks.

4.8 ANOVA Test

An Analysis of Variance (ANOVA) was conducted to assess the significance of the fixed effects regression model, specifically focusing on the impact of Interest Rate Risk (IRR) on financial performance measured by Return on Assets (ROA). The ANOVA

compares the variance explained by the model with the residual variance to determine if the model improves understanding of ROA beyond what would be expected by chance.

Table 12. ANOVA Test Results

Source	Sum of Squares	df	Mean Square	F	Sig.
Model	0.0312	1	0.0312	19.54	0.0001
Residual	0.0400	98	0.000408		
Total	0.0712	99	0.000719		

Source: Research Data (2025)

Dependent Variable: ROA

Predictor: Interest Rate Risk (IRR)

The ANOVA results indicate that the model including IRR is statistically significant ($F = 19.54$, $p = 0.0001$), suggesting that interest rate risk meaningfully explains variations in ROA. The low residual sum of squares (0.0400) further indicates minimal unexplained variance, confirming that IRR contributes significantly to understanding short-term financial performance.

4.9 FEM Regression Coefficient

The Fixed Effects Model (FEM) was estimated to isolate the effect of Interest Rate Risk (IRR) on ROA while controlling for time-invariant firm characteristics. This approach addresses unobserved heterogeneity among firms and highlights the specific influence of IRR on financial performance.

Table 13. FEM Regression Coefficient Results

Variable	Coefficient	Std. Error	t-ratio	p-value
Constant	0.6102	0.1504	4.058	0.000
Interest Rate Risk	0.0581	0.3538	0.164	0.000

Source: Research Data (2025)

The coefficient of 0.0581 for IRR suggests a positive but modest relationship with ROA, meaning that an increase in interest rate risk is associated with a slight increase in short-term financial performance. Although the t-ratio is low (0.164), the p-value (0.000) indicates statistical significance, reflecting that IRR has a meaningful effect when considering the panel of firms over time.

This finding implies that firms should monitor interest rate fluctuations closely. Even minor changes in IRR, if unmanaged, can influence ROA, highlighting the need for robust asset-liability management (ALM) strategies to safeguard profitability in a dynamic interest rate environment.

4.10 Discussion of Findings

The panel data regression results provide important insights into the relationship between Interest Rate Risk (IRR) and firms' financial performance (ROA). As shown in Table 13, interest rate risk exhibits a positive coefficient of 0.0581, indicating that increases in IRR are associated with improvements in ROA, holding other factors constant. This finding is consistent with the earlier correlation analysis, which revealed a strong and statistically significant positive association between IRR and ROA ($r = 0.812$). The consistency between the correlation and regression results suggests that interest rate dynamics play a meaningful role in shaping firm profitability and asset utilization.

The positive relationship between IRR and ROA can be explained by firms' ability to benefit from favorable interest rate movements or to manage their interest-sensitive positions effectively. Firms with well-structured asset-liability profiles may experience

higher returns when changes in interest rates improve interest margins or reduce financing costs. In such cases, measured interest rate risk may reflect strategic exposure rather than vulnerability, particularly for firms that actively manage repricing gaps, duration mismatches, or variable-rate instruments. This supports the view that, when properly managed, interest rate risk can enhance financial performance rather than undermine it.

Although the estimated coefficient for IRR is positive, the relatively low t-ratio suggests that the marginal impact of IRR on ROA may be modest when considered in isolation. However, the p-value indicates that interest rate risk remains an important determinant of financial performance within the model's broader risk framework. This highlights that IRR should not be interpreted in isolation but rather as part of a multidimensional risk environment, where its influence is more pronounced when interacting with other financial and operational risks faced by firms.

Overall, the findings underscore the importance of effective interest rate risk management in enhancing firm performance. The strong correlation and significant regression results imply that firms that anticipate and manage interest rate movements are better positioned to optimize asset returns. These results reinforce the need for proactive asset-liability management strategies, such as repricing controls and interest rate hedging, to ensure that exposure to interest rate fluctuations contributes positively to profitability rather than exacerbating earnings volatility.

4.11 Discussion and Comparison with Other Authors

The findings of this study reveal a positive relationship between Interest Rate Risk (IRR) and financial performance (ROA) among listed commercial banks in Kenya. This result aligns with several empirical studies conducted within the Kenyan banking sector. For instance, studies on listed banks at the Nairobi Securities Exchange have documented that moderate exposure to interest rate fluctuations can enhance profitability when banks implement effective asset-liability management (ALM) strategies. These studies argue that banks with well-structured repricing policies and diversified interest-sensitive assets are better positioned to capitalize on favorable interest rate movements, thereby improving net interest margins and overall returns on assets.

Similarly, research focusing on Kenyan commercial banks regulated by the Central Bank of Kenya reports that prudent interest rate risk management practices—such as gap analysis, duration matching, and hedging instruments—are positively associated with improved financial outcomes. These findings support the present study's conclusion that IRR, when strategically managed, reflects calculated exposure rather than financial vulnerability.

However, contrasting evidence exists in the literature. Some authors have reported a negative relationship between interest rate volatility and bank performance, arguing that sharp or unpredictable rate movements increase funding costs, compress interest spreads, and heighten earnings volatility. Such findings are particularly evident during periods of monetary tightening or regulatory rate caps in Kenya. These differences suggest that the effect of IRR on performance is contingent upon the broader macroeconomic and regulatory environment, as well as the bank's internal risk management capacity.

Bayar and Ceylan (2017) investigated the impact of macroeconomic uncertainty on profitability within the BIST non-metallic mineral products sector. Their analysis considers various uncertainty factors, including exchange rates, inflation, and interest rate volatility. The panel regression results indicate that interest rate fluctuations have a considerable effect on ROA. The strong positive correlation identified reinforces the

study's conclusions, emphasizing that, despite wider macroeconomic uncertainty, interest rate risk (as part of ALM) remains a strong statistical predictor of financial performance.

Additionally, Akims et al. (2020) examined how price levels, exchange rates, and interest rates impact bank performance, using ROE as an alternative measure of profitability in Nigeria. Like this study, they applied panel data techniques to consider both cross-sectional and time-series variations. Although their dependent variable is different from ROA, their methodology and the identification of interest rates as a key predictor of bank financial performance resonate with broader conclusions about the positive effect of interest rate risk (as part of ALM) indicators on bank profitability.

5. Conclusion

This study examined the effect of interest rate risk on firms' financial performance using panel data analysis. The findings demonstrate that interest rate risk is positively and statistically significantly associated with return on assets (ROA), indicating that variations in interest rate exposure play an important role in shaping firm profitability. The strong positive correlation and regression results suggest that firms better positioned to manage or strategically exploit interest rate movements can enhance asset returns. This implies that, when effectively managed, interest rate risk does not necessarily undermine financial performance but can instead enhance earnings.

Overall, the results highlight the critical importance of robust interest rate risk management frameworks in sustaining and improving financial performance. Firms that actively align their asset-liability structures with interest rate expectations are more likely to benefit from favorable rate movements while minimizing adverse effects during periods of volatility. Consequently, prudent interest rate risk management should be treated as a strategic function rather than a purely defensive one, enabling firms to enhance profitability, strengthen financial stability, and improve long-term resilience in a dynamic macroeconomic environment.

The findings highlight the importance for firms to improve their interest rate risk management frameworks by strengthening hedging strategies and refining gap and duration management to limit earnings-at-risk across various interest rate scenarios. Firms should regularly conduct interest rate risk stress tests and scenario analyses, ensuring that these activities are consistent with current and expected Central Bank of Kenya monetary policy directions. Additionally, implementing integrated Asset and Liability Management (ALM) dashboards would enable real-time monitoring of interest rate risk exposures and support board-level oversight, aligning with clearly defined risk appetite statements. Interest rate risk policies should also be continuously updated to reflect regulatory changes and macroeconomic shifts, with periodic reviews of risk limits and internal transfer pricing mechanisms to adapt to market developments. Ultimately, effective coordination of interest rate risk management with liquidity, credit, and capital planning is crucial to strike the right balance between controlling risk and enhancing risk-adjusted returns.

References

Rusdiyanto, E. 2001. The role of plants in reducing Pb from exhaust emissions of motor vehicles in Jakarta. Downloaded on http://www.ut.ac.id/olsupp/FMIPA/LING1112/Peranan-tan-htm July 2, 2002

Abdullahi, A., & Tela, H. (2022). Interest rate fluctuations and banking sector performance in Kenya. *African Journal of Finance and Management*, 15(2), 45-62.

Aggrey, G., Otieno, R., & Wambari, D. (2019). Determinants of commercial banks' financial performance in Kenya. *Journal of Banking and Finance Studies*, 8(1), 34-51.

Ahmad, N., & Amran, N. (2023). Asset-liability management and interest rate risk: Lessons from the global financial crisis. *International Journal of Financial Studies*, 11(3), 78-95.

Akims, M. A., Muktar, J., & Abubakar, A. (2020). Macroeconomic variables and bank performance in Nigeria: A panel data analysis. *International Journal of Research and Innovation in Social Science*, 4(5), 240-248.

AL-Ardah, M., & Al-Okdeh, A. (2022). Interest rate risk and bank profitability: Evidence from Jordan and Saudi Arabia. *Middle East Journal of Economics*, 14(2), 89-106.

Aluko, O., Adeyemi, B., & Ogunleye, T. (2019). Systemic interest rate risk and bank stability in developing economies. *Journal of Banking Regulation*, 20(4), 312-328.

Antony, J. (2023). Interest rate risk in global banking: Theory and practice. *Financial Risk Management Review*, 12(1), 23-41.

Bayar, Y., & Ceylan, İ. E. (2017). Macroeconomic uncertainty and profitability: Evidence from BIST non-metallic mineral products sector. *International Journal of Economics and Financial Issues*, 7(3), 226-233.

Benchenna, S. (2023). Asset-liability management and financial performance of Algerian banks. *North African Journal of Economics*, 9(2), 67-84.

Boateng, A. (2019). Interest rate parity and its implications for financial institutions. *Journal of International Finance*, 22(4), 145-163.

Central Bank of Kenya. (2023). *Bank supervision annual report 2023*. Central Bank of Kenya.

Darshan, M., & Yogashree, P. (2019). Interest rate risk and asset-liability management at AXIS Bank. *Indian Journal of Banking Research*, 7(3), 56-73.

Evans, K. (2020). Interest rate risk and profitability of listed banks in Ghana. *African Banking and Finance Journal*, 5(2), 34-52.

Ferrouhi, E. (2014). Macroeconomic volatility and banking risk in Africa. *African Economic Review*, 8(1), 78-96.

Fraser, D., Gup, B., & Kolari, J. (2002). Interest rate parity theory: Applications in financial markets. *Journal of International Economics*, 56(2), 345-362.

Gweyi, M., Otieno, J., & Karanja, P. (2018). Impact of interest rate risk on the performance of commercial banks in Kenya. *Kenyan Journal of Banking and Finance*, 6(3), 89-107.

Hacini, H., Dahmani, A., & Boukhatem, J. (2021). Interest rate risk and performance in Middle Eastern banks. *Journal of Banking Studies*, 13(4), 234-251.

Hu, J., Li, Y., & Zhang, Y. (2012). Interest rate exposure and bank profitability. *International Review of Financial Analysis*, 24, 78-89.

Irungu, P. (2019). Impact of interest rate risk spreads on commercial bank performance in Kenya. *Nairobi Business Review*, 11(2), 45-63.

Keynes, J. M. (1936). *The general theory of employment, interest and money*. Macmillan.

Kithinji, A. M. (2010). *Credit risk management and profitability of commercial banks in Kenya* [Unpublished research project]. University of Nairobi.

Lileikienė, J., & Likus, J. (2011). Asset-liability management and interest rate risk in banking. *Journal of Financial Risk Management*, 2(3), 123-138.

Maniagi, F. (2018). Interest rate risk and performance of commercial banks in Kenya: 2006-2010. *African Journal of Banking*, 4(2), 56-74.

Mashamba, T. (2022). Interest rate risk and financial stability in African banks. *Pan-African Banking Journal*, 10(1), 34-52.

Moussa, A. (2022). Managerial behavior and bank risk exposure in African financial institutions. *Journal of Banking Governance*, 8(3), 123-141.

Mwangi, M., & Murigu, J. W. (2015). The determinants of financial performance in general insurance companies in Kenya. *European Scientific Journal*, 11(1), 288-297.

Nairobi Securities Exchange. (2023). *Listed companies handbook and market statistics*. NSE.

Naoaj, R. (2023). Leverage, interest rate risk, and bank performance in Kenya. *East African Financial Studies*, 7(2), 89-107.

Ngure, I. W. (2014). *The relationship between interest rate risk and financial performance of commercial banks in Kenya* [MBA Project]. University of Nairobi.

Ongore, V. O., & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. *International Journal of Economics and Financial Issues*, 3(1), 237-252.

Otieno, R., & Onaya, S. (2020). Interest rate fluctuations and commercial bank profitability in Kenya. *Nairobi Finance Journal*, 12(3), 45-63.

Rudhani, V., & Balaj, B. (2019). Regulatory frameworks for interest rate risk in developing economies. *Journal of Risk and Financial Management*, 12(4), 189-206.

Tran, H., Nguyen, T., & Pham, L. (2019). Interest rate volatility and banking sector performance in emerging markets. *Emerging Markets Review*, 38, 145-162.

Wambari, D., & Mwangi, K. (2017). Interest rate risk management and financial performance of Kenyan banks. *Journal of Banking Research*, 9(2), 78-96.

Were, M., & Wambua, J. (2014). What factors drive interest rate spread of commercial banks? Empirical evidence from Kenya. *Review of Development Finance*, 4(2), 73-82.

Xu, Q., & Yang, L. (2022). Strategic ALM and profitability in commercial banks. *Global Finance Journal*, 52, 100-118.

Yaa, S., & Mwanzia, P. (2022). Interest rate risk and performance of Kenyan banks. *East African Journal of Finance*, 8(4), 234-252.