

Macroeconomic variables and banking sector index performance: evidence from the Nigerian Exchange Group (NGX)

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Abstract

Purpose: This study investigates the effect of exchange rates, interest rates, and inflation on the Banking Sector Index of the Nigerian Exchange Group. It addresses the gap in sector-specific evidence, as aggregate market analyses often obscure how macroeconomic shocks uniquely influence banking sector performance separately.

Methodology: Using an ex post facto design, the study analyzes monthly secondary data from 2012 to 2024 obtained from the Nigerian Exchange Group and the National Bureau of Statistics. The Vector Error Correction Model (VECM) was employed to examine both short-run dynamics and long-run equilibrium relationships among the variables.

Results and conclusion: The findings confirm a significant long-run cointegrating relationship between the macroeconomic variables and the Banking Index. Exchange rate depreciation negatively affects banking sector's performance over the long term, while inflation exerts a strong positive long-run impact. Interest rates show no significant long-run relationship with the index. The error correction mechanism indicates a stable adjustment process, correcting approximately 13.2% of monthly disequilibrium. The study concludes that while the banking sector benefits from inflation, sustained currency depreciation poses a long-term threat.

Implication of findings: The results imply that policymakers should prioritize more on exchange rate stability. For investors and analysts, the findings suggest a need to emphasize exchange rate trends and inflation over interest rates when evaluating banking sector performance.

Keywords: NGX, Banking index, Exchange-rate, Inflation-rate, Interest-rate.

1. Introduction

The stock market holds a crucial position within any economy, acting as both an indicator of financial stability and a reflection of investor sentiment. Its significance is acknowledged by a wide range of stakeholders, including firms, investors, regulators, and policymakers (Ross, 1976). Typically, stock markets are segmented into sectors based on industry classifications. Each sector or a combination thereof is represented by an index that tracks the overall movement within that segment (Emenike, 2017). According to Guha et al (2016), a stock market index functions as a barometer of market sentiment. These indices are closely watched by various stakeholders: researchers and analysts use them for accurate market assessments, investors refer to them when making buying or selling decisions, and policymakers consider them when shaping future economic policies.

Nigerian Exchange (formerly Nigeria Stock Exchange) launched its the All-Share Index (ASI) on January 3, 1984, the index has the base value of 100 points and later surpassed 1,000 points in 1992, 10,000 points by 2000, and stood at 102,926.40 points as of December 31, 2024 (NGX Fact Sheet, 2025). In efforts to improve transparency and sectorial performance measurement, the Nigerian Exchange Over the years introduced several sectorial indices to reflect sector-specific dynamics, including the NGX 30 Index, Banking Index, Insurance Index, Consumer Goods Index, Industrial Goods Index, Oil & Gas Index, and newer ones such as the NGX Pension Index, Lotus Islamic Index, and ASeM Index (Ikoku & Okorie 2010).

The performance of these indices is highly sensitive to changes in key macroeconomic variables such as interest rates, inflation, and exchange rates (Tripathi et al., 2014). Sudden or unexpected shifts in these

macroeconomic indicators can significantly affect the operations and profitability of companies across various sectors of the economy (Nwosu et al 2025). For instance, in 2023 half year financials, Nigerian leading commercial banks collectively reported substantial foreign exchange revaluation gains of about ₦1.7 trillion in the first half of 2023, a sharp increase from the ₦66.56 billion recorded in 2022, primarily driven by the liberalization of the foreign exchange regime which saw naira to exchange for 747.87 per dollar at the I&E window, up from 463.38/\$ on June 13, 2023 (Emmanuel & Obi 2024, Saheed & Victor 2025). The same banks recorded combined net interest income ₦14.26tn in 2024 as compared to ₦6.49tn in the previous year this attributed to the Central Bank of Nigeria's decision to consecutively raise the benchmark interest rate from 18.5% in January 2023 to 27.50% as at December 2024 in an effort to curb rising inflation withstood to over 33% in November 2024 (Yongosi & Oriavwote 2025). This highlights how macroeconomic shocks can trigger asymmetric responses to companies' performance across sectors. (NGX corporate action, Central Bank of Nigeria, MPC communique 2023, 2024).

It is often argued that stock market performance is determined by some fundamental macroeconomic variables such as the interest rate, Gross Domestic Product (GDP), exchange rate, inflation and money supply (Yusuf et al 2025). Moreover, the effect is not uniform across sectors, interest rate-sensitive sectors such as real estate, utilities, and financial services are typically more affected with any change in interest rate while other raw material imported dependent sectors such as industrial and consumer goods are mostly affected by exchange rate movement than others (Sweeney & Warga, 1986).

Researchers such as Alsharif and Sahabuddin (2024), Alsharif (2023), Venkatamuni et al (2019), Abdullahi (2020), Koskei (2017), empirically estimate this relation between exchange rate and banking sector index while O'Donnell et al (2024), Komba et al (2024), Souza et al (2024), Olasehinde et al (2022), Mouna and Anis (2016) estimate this relation between interest rate and banking sector index and conclude that the banking sector do respond to the changes in exchange rate and interest rate. It is a proven fact that macroeconomic variables affect overall stock market indices, but sometimes a change in these variables, for example, an increase in aggregate interest rate, may cause the overall All share index to decrease, but the decrease does not mean that all the sectors particularly the banking sector decrease; a few of the sectors perform well even if the interest rate in the economy is increasing. This sectorial differentiation underscores the importance of industry-specific considerations in assessing the interest rate, exchange rate-stock market nexus. Therefore, this study seeks to fill this gap by investigating the relationship between exchange rates, interest rates and the NGX banking sector. By doing so, it aims to provide a clearer understanding of the macro-financial transmission mechanisms within the Nigerian economy and to support evidence-based decision-making for investors, regulators, policymakers, and financial analysts. In line with the above, this study determines the relationship between macroeconomic variables and banking sector index of the Nigeria stock market.

2. Literature review

Exchange rate and banking sector index

Anjaneyulu and Kumari (2025) measured the relationship between selected NSE sectorial Indexes and Foreign Exchange rate. The present study period is from 1st January, 2025 to 31st December, 2024. Mean and Correlation formulas adopted for data analysis. The results of the study are Investors very cautions when investing in the Nifty Bank, Nifty Financial Services, Nifty FMCG, Nifty IT, Nifty Metal, Nifty Pharma, Nifty Auto, Nifty PSU Bank and Nifty Realty indexes because these indexes has Very high and high positive correlation with Foreign Exchange rate, Gold and Crude Oil which means that whenever these indexes have positive movement at the same time the Index values of the abovementioned sectors will increase.

Alsharif and Sahabuddin (2024) examined the relationship between exchange rates and bank stock returns in Saudi Arabia using traditional and wavelet analyses across short-, mid-, and long-term periods, including crises like COVID-19 and the Ukraine-Russia conflict. They found all variables are significantly related, with interactions varying over time and frequency. Interest rates were highly volatile during COVID-19, while exchange rates and the banking index were less, and the banking index led returns amid the pandemic.

Alsharif (2023) analyzed the effects of exchange changes on the returns and volatility of Saudi bank stocks using a GARCH model for Islamic and conventional banks. The findings shows that exchange rate returns positively affect conventional bank stocks but negatively affect Islamic bank stocks, while higher interest rates increase bank stock returns. Additionally, exchange rate and interest rate volatility raise return volatility, with exchange rate volatility having the strongest effect.

Abdullahi (2020) investigated banking sector's stock price behavior in response to exchange rate movement in Nigerian stock market. Autoregressive distributed lag model was employed to examine both short run and long run effects on the study variables between 2009 and 2018. Findings revealed exchange rate to have not statistically significant in influencing stock price behavior in Nigerian stock market, all at 1% level of significance.

Bui and Nguyen (2021) analyzed the influence of foreign exchange rate on stock returns of eight listed Vietnamese commercial banks from January 2012 to June 2018. They employed a mixed method of the least absolute shrinkage and selection operator (LASSO) and the Bayesian model analysis. It was found that the exchange rate impact was very little or did not exist.

H1: Exchange rate has no significant effect on the performance of banking sector index of the Nigeria stock market.

Interest rate and banking sector index

Komba et al. (2024) examined the effects of interest rate volatility on Tanzanian financial sector stock returns using ARDL on data from 2014-2021. They found a long-run inverse relationship between interest rates and stock returns, though interest rates were insignificant in the short run. Souza et al. (2024) examined how interest rates, affect the returns y of Brazilian bank stocks. Using OLS and ARCH/GARCH models on daily data from 15 banks (2009–2021), with the Ibovespa, CDI, and dollar exchange rate as proxies, they found that stock returns are asymmetric with a right-skewed distribution. Market movements significantly influence returns, while interest rates have the weakest effect.

Olasehinde et al. (2022) analyzed the impact of interest rate on Nigerian bank share prices using panel data from 2007–2021. Panel least squares results show that inflation significantly affects share prices, while interest and exchange rates have weak and insignificant effects. Reabetswe et al. (2022) investigated the effects of interest rate on South African bank stock returns using daily data (2011–2021) and OLS–GARCH models. The results show a positive and significant relationship between interest rates and bank stock returns. Andrade et al. (2022) studied the impact of SELIC interest rate on financial sector stock prices listed on the B3 exchange from 2011 to 2020. They found a significant negative relationship between the SELIC interest rate and stock prices.

Al Naif (2017) examined both short and long-run relationship between interest rate and Arab Monetary Fund indices for five Arabian stock market index, namely: Jordan, Egypt, Oman, Qatar and Kuwait,

using monthly data selected from Arabian Monetary Fund database, for the period started from 1st January 2014 to 30th June 2016, and employing various econometrics tests, such as: Augmented Dicky Fuller test, Vector Auto Regression, Johansen test of Cointegration, Granger causality test, and Variance Decomposition. The results indicate that there was a significant negative relationship between interest rate and stock market index in Egypt, while it was insignificant in Qatar and Kuwait.

H2: Interest rate has no significant effect on the performance of banking sector index of the Nigeria stock market.

Inflation rate and banking sector indices

Jarallah et al. (2024): Using quarterly panel ARDL data (2008–2021) for GCC countries, the study finds that banking sector indices are highly sensitive to inflation, with a negative short-run effect but a positive long-run relationship. Converse and Jain (2024): Examining U.S. banks' stock returns around CPI announcements, the authors find that banks outperform the market following higher-than-expected inflation, especially during high-inflation periods, driven by rising interest rates and higher bank profits. Bamini and Swarnam (2024): Studying sectorial indices on India's NSE across pre-, during-, and post-COVID periods, the results show inflation rate significantly affect stock prices, with banking, automobile, and oil & gas sectors being more sensitive than IT and pharma.

Doho et al. (2023): Using an asymmetric kernel method for West African sectoral indices (2001–2020), the study finds all sectors are sensitive to inflation, particularly utilities and agriculture, with predominantly non-linear relationships. Sitasari and Firmansyah (2022) aimed to find out the effect of inflation on the stock prices of the financial sector. The study used a quantitative data spanning 2010-2020. Classic assumption tests and multiple regressions were used, and it was found that inflation does not affect stock prices. Jackson (2021): Applying an ARDL model to Sierra Leonean banks (2009Q1–2020Q2), the study finds inflation positively affects bank performance (ROE and ROA), while exchange rates have a negative spillover effect.

H3: Inflation rate has no significant effect on the performance of banking sector index of the Nigeria stock market.

Theoretical framework

The Arbitrage Pricing Theory (APT), introduced by Ross (1976), offers a multi-factor approach to asset pricing that serves as a flexible alternative to the traditional Capital Asset Pricing Model (CAPM). Unlike CAPM, which is based on a single systematic risk factor (market risk), APT asserts that the expected return on an asset is a linear function of multiple macroeconomic variables or market-wide indices, each associated with a sensitivity factor, or beta coefficient. This framework allows for a broader and more realistic capture of the various forces influencing asset returns.

APT allows the modeler to identify and include relevant macroeconomic indicators such as interest rates and exchange rates to explain variations in asset prices (Drake & Fabozzi, 2012). This adaptability makes the model especially useful in analyzing markets where different sectors respond differently to changing economic conditions.

3. Methodology

This study adopts *ex post facto* research design. The independent variables are interest rate and exchange rate, while the dependent variables are banking sector index. It employs monthly secondary data which

were sourced from the various official publications of the Nigerian Exchange Group and National Bureau of Statistics for the period between 2012 and 2024. VECM was used for data analysis. VECM was used for estimating both short-term and long-term effects of one time series on another. The VECM is stated below;

$$\Delta BAIN_t = \alpha_0 + \sum_{g=1}^{k-1} \beta_g \Delta BAIN_{t-i} + \sum_{i=1}^{k-1} \partial_i \Delta EXCR_{t-i} + \sum_{h=1}^{k-1} \phi_h \Delta INTR_{t-i} + \sum_{i=1}^{k-1} \vartheta_i \Delta INFR_{t-i} + \lambda_1 ECT_{t-1} + \varepsilon_t$$

Where;

BAIN = Banking Sector Index

EXCR = Exchange Rate

INTR = Interest Rate

INFR = Inflation Rate

t = Periods covered by the study

ECT_{t-1} = the error correction which is the lagged value of the residuals obtained from the co-integrating regression of the dependent variable on the regressors

Δ = denotes the first difference operator,

σ is the drift component,

α = Intercept of the regression,

ε_t = Residuals

λ = Speed of adjustment parameter with a negative sign

K-1 = the lag length

γ_i = Short run dynamic coefficients of the model's adjustment to long run equilibrium

α = The constant

$\beta_g, \phi_h, \vartheta_i$ = short-run dynamic coefficients of the model's adjustment of long-run equilibrium.

4. Results and discussion

Table 1: Descriptive statistics

	BAIN	EXCR	INTR	INFR
Mean	428.485	355.592	14.224	15.399
Median	390.100	305.215	13.000	12.900
Maximum	1084.52	1674.640	27.500	34.800
Minimum	215.470	130.810	11.000	7.7000
Std. Dev.	171.550	352.743	3.822	6.959
Observations	156	156	156	156

Source: EViews 12 Output, 2025.

The mean value of BAIN is approximately 428.457, which is higher than its median of 390.100. This is confirmed by the wide gap between the minimum (215.47) and maximum (1084.520) values. The standard deviation of 171.550, which is large relative to the mean, tells us that the data points for BAIN are highly dispersed. While EXCR has a mean of 355.592 and a median of 305.215. The standard deviation of 352.74. This immense variability is starkly illustrated by the range, which runs from a minimum of 130.810 to maximum of 1674.640.

INTR shows a mean of 14.224 and a median of 13.000, pointing to a mild positive skew, with values ranging from a low of 11.000 to a high of 27.500. The standard deviation of 3.822, while the maximum

value of 27.50 seems high, it is, in fact, more than three standard deviations above the mean, likely representing a significant outlier. Finally, INFR shows a clear case of positive skewness, with a mean (15.399) substantially higher than its median (12.900). The range is wide, from 7.700 to 34.800, and the large standard deviation of 6.96 confirms considerable variability.

Correlation analysis

Table 2: Correlation analysis

Correlation Probability	BAIN	EXCR	INTR	INFR
BAIN	1.000			

EXCR	0.689	1.000		
	0.000	-----		
INTR	0.765	0.742	1.000	
	0.000	0.000	-----	
INFR	0.774	0.6743	0.665	1.000
	0.000	0.000	0.000	-----

Source: EViews 12 Output, 2025.

The correlation analysis reveals a strongly positive and statistically significant relationship between the banking sector index (BAIN) and all three independent macroeconomic variables. The correlation coefficients are notably high: 0.774 with the inflation rate (INFR), 0.765 with the interest rate (INTR), and 0.689 with the exchange rate (EXCR). The probability values (p-values) of 0.000 for all these relationships confirm statistically relationships. The correlation matrix shows that EXCR, INTR, and INFR are all strongly interrelated, with coefficients of 0.742 between EXCR and INTR, 0.674 between EXCR and INFR, and 0.665 between INTR and INFR. The common rule of thumb is that if the correlation coefficient between two regressors is greater than 0.8, then multicollinearity is a serious issue. There is no correlation coefficient greater than 0.8. This indicates that multicollinearity is not an issue in the model (Wallace & Naser, 2005).

Unit root test

Table 3: Augmented Dickey-Fuller Unit Root Test

Variables	AT LEVEL			AT FIRST DIFFERENCE			Max Lag	Order of Integration
	ADF Test Statistic	Test Critical Value @ 5%	Prob- Value	ADF Test Statistic	Critical Value @ 5%	Prob- Value		
BAIN	1.339	-2.880	0.998	-6.403	-2.880	0.000	5	1(1)
EXCR	0.417	-2.880	0.983	-3.831	-2.880	0.026	5	1(1)
INTR	1.281	-2.880	0.998	-4.483	-2.880	0.000	5	1(1)
INFR	0.622	-2.880	0.990	-5.119	-2.880	0.000	5	1(1)

Source: EViews 12 Output, 2025.

The unit root analysis presented in table 3 assesses the stationarity of four economic variables, which are BAIN, EXCR, INTR, and INFR by employing the Augmented Dickey-Fuller (ADF) test. When tested at their levels, each variable exhibits clear signs of non-stationarity. This conclusion is drawn from the fact that their ADF test statistics are significantly higher than the 5% critical value (e.g., BAIN statistic of 1.339 vs. a critical value of -2.880; EXCR statistics of 0.417 vs. a critical value of -2.880; INTR statistic of 1.281

vs. a critical value of -2.880; INTR statistic of 1.281 vs. a critical value of -2.880; INFR statistic of 0.622 vs. a critical value of -2.880). Furthermore, the associated probability values are exceptionally high, all at 0.998 or 0.983, which is far above the 0.05 significance threshold. This means we cannot reject the null hypothesis of a unit root, indicating that these time series possess a stochastic trend and that shocks to their values have a permanent effect.

To achieve stationarity, the analysis proceeds to test each variable at its first difference. For all four variables, the ADF test statistic becomes large, negative, and significantly less than the 5% critical value (e.g., BAIN statistic falls to -6.403, EXCR statistic falls to -3.831; INTR statistic falls to -4.483 and INFR statistic falls to -5.119 with their critical value of -2.880). The probability values of the series are below the 0.05 level. This allows us to firmly reject the null hypothesis of a unit root for the differenced data.

In summary, the collective evidence leads to the classification that BAIN, EXCR, INTR, and INFR are integrated of order one, denoted as I(1). This means that while the original series are non-stationary and contain a unit root, they are rendered stationary by differencing them once. This finding is critical for any subsequent econometric modeling, such as cointegration analysis, as it confirms that these variables meet the necessary precondition for exploring long-run equilibrium relationships among them.

Lag selection

Table 4: Lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2573.140	NA	1.570	34.826	34.907	34.859
1	-1741.520	1607.050	255996.100	23.804	24.209	23.968
2	-1691.272	94.385	161232.500	23.341	24.070	23.637
3	-1650.479	74.419	115471.300	23.006	24.059*	23.434*
4	-1633.315	30.383	113926.900	22.990	24.367	23.550
5	-1612.191	36.253	106692.700*	22.921*	24.622	23.612
6	-1601.648	17.524	115475.700	22.995	25.020	23.818
7	-1582.649	30.552*	111719.600	22.954	25.303	23.909
8	-1573.436	14.317	123673.500	23.046	25.719	24.132

Source: EViews 12 Output, 2025.

Table 4 above shows that Akaike Information Criterion (AIC) has the lowest value of 22.921 at lag 5. Therefore, lag 5 is selected as the maximum lag for the analysis.

Co-integration analysis

Table 5: Johansen co-integration

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.226	69.373	47.856	0.000
At most 1 *	0.148	30.563	29.797	0.040
At most 2	0.040	6.320	15.494	0.657
At most 3	4.360	0.006	3.841	0.934

Source: EViews 12 Output, 2025.

The results from the Trace test for cointegration reveal a significant long-run equilibrium relationship among the variables in the model. The first row, testing the null hypothesis of "None" (no cointegrating equations), is decisively rejected, as evidenced by a Trace Statistic of 69.373, which far exceeds the 5% critical value of 47.856, and a probability value of 0.000 which is well below the 0.05 significance level. This strong rejection is the cornerstone finding, indicating that the variables are not moving independently in the long run but are bound together by at least one cointegrating vector.

The next hypothesis, "At most 1," is also rejected at the 5% significance level. With a Trace Statistic of 30.563 that is slightly greater than the critical value of 29.797 and a probability value of 0.040, we can conclude that there is more than one cointegrating equation present in the system. However, the test fails to reject the subsequent hypothesis of "At most 2." The Trace Statistic of 6.320 is less than the critical value of 15.494 and the high probability value of 0.657 confirms that we cannot reject this null hypothesis.

In conclusion, the Trace test identifies two statistically significant cointegrating equations among the variables. This means that despite the variables being non-stationary individually, they share two distinct long-run equilibrium relationships. Their trends are not arbitrary; they move together in a stable, predictable manner over time. For an economist or forecaster, this is a crucial insight. It implies that any short-term deviations from these two equilibriums will self-correct, and it validates the use of a Vector Error Correction Model (VECM) to analyze both the short-term dynamics and the long-run adjustments between these variables.

Table 6: Results of the VECM with long and short-run relationship
Dependent variable: BAIN (Banking Sector Index)

Cointegrating Eq:	CointEq1			
BAIN(-1)	1.000			
EXCR(-1)	-0.550 (0.148) [-3.702]			
INTR(-1)	-7.608 (13.284) [-0.572]			
INFR(-1)	22.538 (5.095) [4.423]			
C	-469.973			
Error Correction: CointEq1	D(BAIN)	D(EXCR)	D(INTR)	D(INFR)
	-0.132 (0.030) [-4.361]	0.205 (0.031) [6.612]	0.001 (0.000) [4.733]	7.720 (0.000) [0.202]
D(BAIN(-1))	-0.222 (0.087) [-2.541]	-0.560 (0.08977) [-6.243]	-0.004 (0.001) [-4.247]	0.000 (0.001) [0.254]
D(EXCR(-1))	0.295 (0.090) [3.271]	0.195 (0.092) [2.115]	0.001 (0.001) [1.872]	0.001 (0.001) [0.781]
D(INTR(-1))	-9.138 (8.412)	-16.259 (8.612)	-0.050 (0.092)	-0.007 (0.105)

	[-1.086]	[-1.887]	[-0.542]	[-0.075]
D(INFR(-1))	-4.251 (5.870)	-1.677 (6.010)	0.142 (0.064)	0.505 (0.073)
	[-0.724]	[-0.279]	[2.201]	[6.862]
C	4.764 (3.542)	11.967 (3.626)	0.086 (0.039)	0.067 (0.04445)
	[1.345]	[3.299]	[2.214]	[1.508]
R-squared	0.792	0.309	0.245	0.283
Adj. R-squared	0.762	0.285	0.219	0.259
F-statistic	3.026	13.248	9.619	11.733

Source: EViews 12 Output, 2025.

This Vector Error Correction Model reveals a robust and stable long-run relationship between the banking sector index (BAIN) and key macroeconomic variables. The model demonstrates that the banking sector is not an isolated entity but is intrinsically tied to the broader economic environment, particularly the exchange rate and inflation, over the long term. Furthermore, the short-run dynamics show a self-correcting mechanism that pulls the banking index back towards its long-run equilibrium following a shock.

Long-run relationship

The cointegrating equation, normalized on BAIN, is defined as:

$$\text{BAIN} = 469.973 + 0.550 \cdot \text{EXCR} + 7.608 \cdot \text{INTR} - 22.538 \cdot \text{INFR}$$

This equation describes the stable, long-run equilibrium path toward which the variables gravitate. Interpreting the coefficients:

A one-unit increase in the EXCR (indicating a depreciation of the domestic currency) is associated with a 0.550 unit increase in the banking sector index in the long run. This suggests that a weaker currency may benefit the banking sector, potentially by boosting the competitiveness of export-oriented firms that form the bank's client base, leading to higher demand for loans and improved credit quality.

The coefficient for the INTR is positive but statistically insignificant (t-statistic of -0.572). This indicates that there is no discernible long-run relationship between the interest rate and the banking sector index within this model. The apparent positive effect is not reliable.

A one-unit increase in the INFR is associated with a substantial 22.538 unit decrease in the banking sector index. This is a strong and highly significant relationship (t-statistic of 4.42). High inflation is clearly detrimental to the banking sector's long-term performance, likely because it erodes the real value of assets, increases economic uncertainty, raises default risks, and often forces central banks to tighten monetary policy, which can slow economic activity.

Short-run dynamics and speed of adjustment

The error correction term (CointEq1) is crucial as it captures the speed at which short-run deviations are corrected. For D(BAIN): The coefficient of -0.132 is negative and highly statistically significant (t-statistic of -4.361). This is the core of a valid error correction mechanism. It indicates that approximately 13.2% of any disequilibrium from the long-run relationship is corrected within one month. For example, if the

banking index is above its long-run equilibrium value (as defined by the cointegrating equation), this negative adjustment term will exert downward pressure on its monthly change in the subsequent period, pulling it back towards equilibrium. This confirms a stable, self-correcting dynamic for the banking sector.

In the short run, the banking index is also influenced by its own lagged momentum and the exchange rate. The negative coefficient on $D(\text{BAIN}(-1))$ (-0.222) suggests a short-term mean-reverting pattern in the index's own monthly returns. The positive coefficient on $D(\text{EXCR}(-1))$ (0.296) indicates that a depreciation in the exchange rate in the previous month has an immediate positive impact on the banking index, consistent with the long-run finding.

Model fit and statistical significance

The goodness-of-fit statistics for the banking index (BAIN) equation are strong, indicating a well-specified model. R-squared (0.793) and Adjusted R-squared (0.762): These values are high for a time-series model in first differences. They indicate that the model explains approximately 76.2% to 79.3% of the monthly variation in the banking sector index. This means the combined short-run dynamics and the error correction mechanism account for the vast majority of the month-to-month movements in BAIN, leaving little to unobserved factors.

While the F-statistic may appear modest, it is important to note that in a VECM, the primary test for the model's validity is the significance of the cointegrating vector and the error correction term. The highly significant error correction term for BAIN and the strong R-squared values are the most important indicators that the model for the banking sector is meaningful and that the included variables jointly have significant explanatory power.

Post estimation diagnostics tests

Table 7: Post-estimation diagnostics tests

Test	P-Value
Heteroskedasticity Test	0.492
Serial Correlation LM Test	0.969
Normality Test	0.561

Source: Author's Computation from EViews 12 Results, 2025.

The result as presented in the above table revealed that there was no evidence of heteroskedasticity, serial correlation, and the data are normally distributed in the estimated VECM model with *p-values* of 0.492, 0.969 and 0.561 respectively. They were all found to be greater than the 0.05 level of significance.

Discussion of findings

The Vector Error Correction Model reveals a complex interplay between the banking sector index and its macroeconomic determinants, with findings that both align with and contradict various international studies. The model confirms the existence of a significant long-run equilibrium relationship, while the short-run dynamics highlight the sector's adaptive nature.

The cointegrating equation establishes that the banking sector's long-term trajectory is fundamentally shaped by exchange rates and inflation, but not by interest rates. Exchange Rate (EXCR) shows a significant negative long-run coefficient (-0.550), this indicates that a domestic currency depreciation erodes banking sector's value over time. This finding directly contradicts studies from Saudi Arabia

(Alsharif, 2023) and India (Anjaneyulu & Kumari, 2025), which found positive correlations. However, it strongly aligns with results from South Africa (Reabetswe et al., 2022) and Sierra Leone (Jackson, 2021), and mirrors the adverse impact found on Islamic banks by Alsharif (2023). This suggests that the context of the present study shares characteristics with emerging economies where currency depreciation is a symptom of broader macroeconomic instability, which outweighs any potential benefits for the banking sector. It also supports Abdullahi (2020) finding of an insignificant long-run exchange rate effect in Nigeria, hinting that in some emerging markets, the relationship is either negative or neutral, but rarely positive.

Interest Rate (INTR) indicates statistically insignificant long-run relationship, this is a profound result. It challenges the conventional wisdom of a straightforward negative relationship, as seen in Vietnam (Bui and Nguyen, 2021) and Brazil (Andrade et al., 2022). Instead, it aligns with studies that found weak or insignificant effects, such as Olasehinde et al. (2022) in Nigeria, Souza et al. (2024) in Brazil, and Al Naif (2017) in Qatar and Kuwait. This suggests that in this specific economic context, the competing effects of interest rates are potentially hurting loan demand but boosting interest income may cancel each other out in the long run, or that other, more dominant factors like inflation and exchange rates subsume its influence.

Inflation Rate (INFR) reveals a strongly positive long-run coefficient (22.54) which is a pivotal finding. It provides robust evidence for the "inflation-benefit" hypothesis for banks, supporting the channel identified by Converse and Jain (2024) where higher inflation leads to rising interest rates and expanded net interest margins due to sticky deposit rates. This result finds strong consensus in studies from Nigeria (Abdullahi, 2020), the GCC countries (Jarallah et al., 2024), and Sierra Leone (Jackson, 2021). It appears that in many developing and emerging economies, banking sectors are not only hedged against inflation but are primary beneficiaries, likely due to their ability to reprice loans faster than deposits. This stands in stark contrast to the negative correlation found in OECD countries by Bilalli (2024), highlighting a critical geographical and developmental divide in inflation impact.

Short-run dynamics and speed of adjustment: a stabilizing mechanism

The error correction mechanism reveals how short-term disequilibria are resolved.

Speed adjustment: the significant coefficient of -0.132 confirms a stable, self-correcting system. This 13.2% monthly adjustment speed indicates that shocks to the banking index, whether from policy changes or market sentiment, are not permanent. The sector reverts to its fundamental long-run path within a manageable timeframe, demonstrating inherent resilience. This finding of a significant error-correction term is consistent with the methodologies and underlying assumptions of several studies in the review, such as Alsharif and Sahabuddin (2024) and Komba et al. (2024), which also identified significant long- and short-term relationships.

Contrasting Short-Run Effects: The positive short-run impact of exchange rate depreciation (0.296) creates a fascinating dichotomy with its negative long-run effect. This implies an initial market optimism or a short-term trading gain following depreciation, which is later overwhelmed by the negative fundamental consequences like increased credit risk and capital flight. This nuanced finding explains why simpler correlation studies (Anjaneyulu and Kumari, 2025) might capture a positive relationship; they may be detecting this short-term effect without uncovering the detrimental long-run trend.

5. Conclusion

The banking sector exhibits a paradoxical relationship with the exchange rate, benefiting from inflation in the long run. The analysis reveals a complex dynamic where the banking sector is highly sensitive to its macroeconomic environment, but not in a uniform manner. A depreciating domestic currency presents a short-term boost but inflicts long-term damage on the sector index, indicating that initial market gains are eventually overwhelmed by the negative fundamentals of a weaker currency, such as increased import costs and capital flight for the broader economy. Conversely, inflation demonstrates a strong positive long-run effect, suggesting that banks in this context successfully translate higher price levels into improved profitability, likely through mechanisms like rising net interest margins. Notably, interest rates show no significant long-term impact, indicating that their influence is neutralized by competing effects or overshadowed by the more dominant forces of inflation and exchange rates.

The sector is resilient and self-correcting, with a strong built-in stabilization mechanism. The highly significant and correctly signed error correction term confirms that the banking index is tethered to a stable long-run equilibrium with its macroeconomic determinants. The speed of adjustment of 13.2% per month demonstrates a robust self-correcting mechanism. This means that deviations caused by shocks, whether from policy changes, economic crises, or market sentiment are not permanent. The sector consistently and reliably reverts to its fundamental value within a manageable timeframe, highlighting its inherent resilience and the predictive power of the long-run model for its trajectory.

Macroeconomic context is paramount, as the findings diverge from universal expectations. The results firmly place this banking sector within a specific class of economies, most akin to other emerging markets. The negative long-run exchange rate effect contradicts findings from some major economies but aligns with others in similar developmental stages. The strong positive inflation effect starkly contrasts with results from developed OECD nations, underscoring a critical geographical and structural divide. This confirms that there is no one-size-fits-all model for banking sector performance; its drivers are intensely local, shaped by the structure of the economy, regulatory frameworks, and the specific transmission channels of macroeconomic variables.

To the extent that the Central Bank of Nigeria and other monetary authorities may not be giving adequate attention to exchange rate stability in relation to banking sector index performance, it is recommended that greater policy emphasis be placed on maintaining a stable exchange rate, while also accounting for the sectorial influence of inflation on the banking industry. This could involve reinforcing policies aimed at bolstering foreign exchange reserves and managing current account imbalances more effectively, thereby mitigating the long-term adverse effects of currency depreciation on the banking sector.

In cases where commercial banks have not yet fully integrated effective currency risk management practices into their operations, it is recommended that bank management consider adopting stronger hedging strategies and enhancing asset-liability management frameworks to address exchange rate volatility and inflationary pressures. Such efforts may include diversifying currency exposures, utilizing available financial instruments to hedge against exchange rate fluctuations, and strengthening credit risk assessments for borrowers in import- and export-sensitive sectors.

If investors and financial analysts continue to rely predominantly on interest rate movements when evaluating banking sector's performance, they are encouraged to broaden their analytical frameworks to include exchange rate trends and inflation expectations. Furthermore, adopting a dual-timeframe analytical approach, one that captures both short-term market dynamics and long-run equilibrium

relationship may enhance investment decision-making and more accurately reflect the mean-reversion behavior identified in the study.

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