

“Bank interest rates and macroeconomic performance: The Nigerian banks’ perspective”

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BANK INTEREST RATES AND MACROECONOMIC PERFORMANCE: THE NIGERIAN BANKS' PERSPECTIVE

Abstract

Interest rates facilitate credit flow in the economy, serve as a monetary transmission mechanism, and support banks in their role as financial intermediaries. Macroeconomic performance enhances people's economic well-being and enables stable economic development. The study aims to examine the effects of Nigerian banks' interest rates on macroeconomic performance in both the long and short run. The study used a historical research design. The model was estimated using the Vector Error Correction Mechanism (VECM) approach. The results showed that the effect of interest rates on gross domestic product was significantly negative in the long run ($C = -0.48985$, $t = -2.31238$, $p < 0.05$), but not in the short run ($p > 0.05$). Interest rates exerted a negative, insignificant effect on savings in the long run ($C = -0.01912$, $t = -0.73741$, $p > 0.05$) and an insignificant effect in the short run ($p > 0.05$). Interest rates had a negative significant effect on gross fixed capital formation in the long run ($C = -0.16559$, $t = -4.25940$, $p < 0.05$) and insignificant effect in the short run ($p > 0.05$), while interest rates had a negative significant relationship with money supply in the long run ($C = -0.05094$, $t = -2.10251$, $p < 0.05$), and also significant in the short run ($p < 0.05$). Interest rate behavior is crucial for determining bank performance; therefore, banks should develop and deploy policy instruments to stabilize interest rates and encourage substantial investment.

Keywords

treasury bill rate, investment, gross fixed capital formation, output, gross domestic product, money supply, savings, financial policy

JEL Classification

E02, E43, G21

INTRODUCTION

Interest rates play a crucial role in maintaining economic equilibrium, both internally and externally, ensuring that resources are allocated effectively throughout the economy. It affects the supply and demand for both financial and tangible investments on several levels, as well as the choices made by economic actors regarding consumption and investment. Interest rates are essential tool and financial engine for transmitting monetary policy and promoting economic growth (Ojo, 2010). The amount of savings, production or output, money supply, and investment in any economy is based on knowledge of the structure and function of interest rates (Fry, 1978). The interest rate is the financial cost for an entrepreneur or business, and the payment made for lending to another. The interest rate determines the cost of borrowing money. Nigerian banks' interest rates are crucial to macroeconomic performance, as they enhance people's well-being and promote economic stability and development.

The imperative for this study arose from the declining investment, output, savings, and money supply rates in late 2022, which led to nu-

merous calls for more robust financial policies. The Nigerian economy continues to record a relatively declining and unsatisfactory growth rate. The average growth rate is 4.14% to 3.40% between 2007 and 2022 (Ani et al., 2024). The performance of the Nigerian economy is constrained by a weak macroeconomic framework, characterized by high and persistent regulatory distortions from the Central Bank of Nigeria, as well as rising monetary policy rates, lending rates, treasury bills, and deposit rates. There have been various discussions about whether wide interest rate margins have the potential to encourage low savings rates and reduce the banking sector's capacity to effectively mobilize deposits from surplus units to fund investments and develop employment sufficient to support economic growth. Monetary policy management appeared ineffectual, as the disparity between lending and deposit rates continued to expand uncontrolled. The high unemployment rate and low productivity impeded investment. There was widespread inflationary pressure, which negatively redistributed income, discouraged economic activity, and hampered economic progress. Most enterprises appear unfunded due to the high cost of raising money from commercial banks. These assertions continued to challenge the well-established theoretical notion that interest rates promote growth and other macroeconomic variables. Many economic strategies were implemented to address the issue of interest rates and to increase savings, investments, employment, and output growth, but they proved to be a mirage. Many scholars who studied interest rates and macroeconomic performance have produced inconsistent results, linking the two ambiguously. There are divergent views on the direction and magnitude of the interest rate in relation to these macroeconomic variables. Frequent shifts in interest rate policies and erratic macroeconomic trends have led to struggling businesses and widespread job losses, with many formerly thriving companies now underperforming. In high inflation, domestic demand remains constrained by stagnating private consumption. To inform effective interest rate policies that drive savings, productivity, investment, and GDP growth, the existing knowledge gaps need to be bridged for policymakers.

1. LITERATURE REVIEW AND HYPOTHESES

The interest rate is the monthly or annual percentage rate that indicates the return on investment or cost of borrowing. A rational man can decide whether to save or squander his money. Sometimes, he prefers to save and defer present consumption to future benefits. Many people save money when they believe the future will repay them with interest; they consume less now to enjoy more in the future (Iwara et al., 2022b). Individuals have many characteristics that impact their savings decisions. The level of income determines the savings culture. Individuals with higher wages may be prone to saving more. However, the decision to save is influenced not just by increased income level, but also by expectations about prospects, precautionary reasons, the tendency to spend, and choosing between consuming and saving over a specified time. The second factor or element that influences the amount of savings is the reward a person receives for lending their savings to another individual who requires more cash and is willing to pay for its utilization (Ojo, 2010).

The interest rate serves as compensation or reimbursement for the utilization of money. It is worth noting that individuals' propensity to save increases when interest rates rise, creating opportunities for investment within the economy. Borrowers' appetite for savings creates a direct positive effect on interest rates. Rising interest rates deter borrowers from investing, tying investment levels directly to interest rates. Borrowers will always wish to invest in a project if the marginal benefit matches the marginal cost or interest rate. Nigeria's unusual rise in real interest rates has sparked significant worry about the possible negative impact on other macroeconomic indicators such as savings, production, money supply, and investment. As of June 2022, Nigeria's treasury bill rate, monetary policy rate, and savings deposit rate were 2.41%, 13.00%, and 1.38%, respectively. In one of its monetary policy committee meetings in May 2022, the Central Bank of Nigeria (CBN) hiked interest rates (Iwara et al., 2022a). However, with inflation still soaring beyond 18%, the CBN has boosted interest rates to 14% to counteract the growing costs of goods and services. Fixed interest rates allow depositors to know ahead of time or in the future how much interest will be permitted or charged

on their accounts. It also informs borrowers about the fees associated with their loans ahead of time. In contrast, variable rates are interest rates that can shift or be altered upwards or downwards with or without prior warning (Iwara et al, 2022b).

A modified version of Keynes's (1936) Keynesian restructured quantity theory of money serves as the framework for this study. The Keynesian quantity theory states that an increase in the money supply first affects the interest rate indirectly. The amount of investment will rise when the interest rate declines. The additional investment will improve effective demand through the multiplier effect, increasing income, production, and employment. The study is supported by the loanable funds interest rate theory proposed by Knut Wicksell (Kuttner, 2001). The financial hypothesis holds that the amount of interest rate in the financial market is determined by factors such as the supply and demand for loanable money. In this theory, interest rates are determined similarly to how the demand and supply are determined; as interest rates rise, so does the availability of loanable money, holding other factors constant. In addition, when interest rates fall, demand for loanable money rises, assuming all other conditions remain constant. Saymeh and Orabi (2013) outlined two variables, among others, that cause the demand curve for loanable money to shift: economic circumstances and monetary growth. In the hypothesis, the interplay between borrowers and lenders influences interest rates. This hypothesis implies that interest rates fluctuate due to supply and demand changes for loanable funds. The rate of interest rises as demand for cash exceeds supply. Similarly, interest rates decline if the money supply exceeds demand. Lower interest charges make borrowing more affordable, facilitating investments by firms and other investors (Okoi, Okoi & Akeh, 2022). Conversely, high interest rates discourage borrowing and investment. The theory also predicts that when interest rates are high, the return on savings rises, giving people an incentive to save rather than spend. The loanable money theory also influences government policies. This theory emphasizes the possibility of crowding out (crowding-out effect), in which increasing government borrowing to cover budget deficits might reduce the number of loanable funds available for private investment. The loanable funds

market aggregates the money available for lending and borrowing by consumers and investors over a specific timeframe. The interaction between potential borrowers and savers determines interest rates. Additionally, the hypothesis assumes economic actors aim to optimize resource utilization throughout their lifetime. Borrowing cash today to capitalize on economic investment opportunities might be one method to boost future real income.

The Liquidity preference model is an alternative technique for determining interest rates in a sustainable economy. This model examines interest rate behavior in response to changes in money supply and demand, rather than changes in the supply and demand for saving. The monetary model posits that consumers and businesses hold money for day-to-day expenses and invest in bonds that pay interest; therefore, in this situation, the interest rate is the alternative cost of retaining monetary cash, as someone may convert it into bonds for additional earnings (Okoi et al., 2022). If bond interest rates are low, there are no substantial opportunity costs, and individuals can easily maintain cash amounts. Thus, under this hypothesis, money demand and interest rates have an indirect connection.

The interest rate liberalization policy in Nigeria is studied in terms of the pre-liberalization era (1970–1986) and the post-liberalization era (1987–2022). The pre-liberalization period (1970–1986) is a period of strict financial repression. In the same vein, it witnessed directed credit and restrictive monetary expansion. For the period (1987–2022), interest rate liberalization plans necessitated the replacement of administratively fixed interest rates with indirect management strategies that use market forces. Udoka et al. (2015) explained in their study that the interest rate has a significant impact on investment and savings in Nigeria. The results showed that interest rates had a favorable and considerable influence on aggregate savings and indirectly influenced aggregate investment. The authors recommended fostering a savings culture because savings and investing are correlated. Similarly, Ebiringa (2012) examined the short-run and long-run interest rate spread in relation to Nigeria's money supply. The study utilized the minimum rediscount rate, commercial bank lending

rates, and savings rates. The exogenous variables employed were savings, prime lending rates, and minimum rediscount rates. The dependent variable was the money supply, and multivariate linear regression was used. The paper concluded that the minimum rediscount rate (monetary policy rate) was inversely proportional to the endogenous variable. The prime lending and savings rates are positively connected to the money supply. Saving and the minimum rediscount rate have different effects on the dependent variable. The prime lending rate has a slight but favorable impact. Adebisi and Babatope (2004) employed a cointegration and error correction mechanism approach, using yearly time series spanning the period from 1970 to 2003, to investigate the relationship between interest rates and other macroeconomic indices, as well as the performance of quoted companies in Nigeria. Findings revealed that financing government deficits and interest rate spreads had a detrimental effect on the expansion of Nigeria's manufacturing subsector. Once more, within the study's time frame, industrial expansion has been aided by economic liberalization. Another study by Rapu et al. (2017) examined the dynamics of interest rates and real production behavior. The study examined how Nigerian real output responded to changes in short-term interest rate dynamics. The variables used were the money supply, lending rate, monetary policy rate, interbank exchange rate, inflation, and output growth. The study used the Bayesian vector autoregressive (BVAR) modelling technique to estimate. The study's findings were contradictory. The impulse response function results showed that positive shocks created minor and negative effects on output in response to the Monetary Policy Rate (MPR). The study concluded that instruments such as policy rate adjustments can boost output growth in an economy where inflation is low and stable. Inyama (2013) employed the Vector Error Correction (VEC) model on a dataset spanning 1979–2010 to investigate the impact of inflation, interest rates, and currency rates on economic activities and national savings in Nigeria. Their analysis reveals that the inflation rate has an adverse correlation with gross domestic product and savings, while interest and exchange rates exhibit a weak positive association. There was no causation between the real gross domestic product, savings, and the inflation rate at either lag two or four. However, the study re-

vealed unidirectional causalities at lag two, with the inflation rate affecting the interest rate, and the interest rate influencing both gross domestic product and savings. Additionally, there was a one-way causal relationship between savings and the inflation rate, as well as a one-way association between the exchange rate and real GDP. Obamuyi (2009) investigated the connection between Nigeria's economic development and interest rates, finding that lending rates have a significant impact on economic development. The study hypothesized that interest rate policies that are economically favorable should be developed and appropriately implemented to support economic development. Another study by Okoi et al. (2022) and Ebiringa (2012) found that interest rates have significant long- and short-run consequences on the level of money supply in Nigeria. Adegoke et al. (2021) explained the relationship between interest rate and economic growth in Nigeria using the ARDL approach. The results showed a robust long-term relationship with a 79.4% speed of adjustment to equilibrium. The result also revealed a statistically insignificant negative relationship between the lending rate and GDP. In contrast, a positive relationship exists between the GDP, the treasury bill, and the exchange rate. Findings from Olayinka (2021) on the interplay between interest rates and inflation rates in Nigeria suggest that interest rates are weak instruments for curbing inflation in the short run but become significant and relevant instruments in the long run. Moreover, inflation rate responses to interest rates were weak in the short run but proved strong in the long run. Babalola (2021) investigated the impact of interest rates on exchange rates in Nigeria and found that in the short run, only the treasury bill rate and price level significantly impact the foreign exchange rate. However, in the long run, all four variables used to proxy the short-term interest rate significantly impact Nigeria's foreign exchange rate. The most recent report by Berko et al. (2022) examined the impact of the interest rate spread on economic growth in Ghana. They discovered that the interest rate spread is a statistically significant determinant of economic growth, but it has a negative impact in the long run. Additionally, the results show that the labor force, capital stock, and exports positively impact Ghana's economic growth in both the long and short run. Ani et al. (2024) found that the interest

rate has a significant long-term effect on GDP. In the short run, the interest rate has a negligible effect on GDP.

Current scholars suggest a link between macroeconomic variables and interest rates; however, the literature lacks specificity regarding the type and number of interest rates that should be considered. As a result, the empirical research already conducted in this extensive literature has demonstrated the use of a wide range of interest rates to investigate their impact on the chosen macroeconomic variables. Consequently, although prior research has significantly advanced our understanding of the correlations between interest rates and the selected macroeconomic variables, the literature's conclusions are inconclusive due to their sensitivity to the choice of variables, country, and period. Thus, it is challenging to generalize the findings because every nation has a different interest rate regime. It is therefore difficult to generalize the results because each country is unique regarding its financial market rules, regulations, and type of investors.

However, a plethora of literature has supported the study on interest rates and economic growth in Nigeria and beyond, noting that interest rates are significant tools for economic growth, development, productivity, investment, and output growth. Many of these results demonstrate long-run and short-run bases: Ogunsakin and Fasina (2022), Berko et al. (2022), Fiaz et al. (2022), Lamidi (2022), Babalola (2021), Adegoke et al. (2021), Olayinka (2021), Njie and Badjie (2021), Kinyanjui et al. (2021), Afful and Kamasa (2020), Iqbal and Jamil (2015), Eregha (2010), and Okoi et al. (2022).

In the same vein, other previous results obtained show a positive but insignificant relationship in Nigeria and other countries: Ani et al. (2024), Lee and Werner (2023), and Ajayi et al. (2017). Moreover, other results that showed a negative but significant relationship were: Tibinyane and Kaulihowa (2021), Li and Khurshid (2015), Dahunsi (2020), Davis and Emerenini (2015), Morosan and Zubas (2015), Babalola et al. (2015), and Salami (2018).

In light of the above, none of the research and literature simultaneously evaluated the effect of

interest rates on other macroeconomic variables (saving, investment, money supply, and production). Researchers made efforts to focus on the impact of interest rates on one or two of these macroeconomic factors, but not all of them. Our study has taken the lead in investigating the combined influence of interest rates on these four macroeconomic variables. Moreover, none of the examined works have used treasury bills to reflect the influence of the risk-free rate on macroeconomic variables in their model. The study distinguishes itself from previous research by seeking to bridge the gap in the literature, which has traditionally limited interest rate studies to a single macroeconomic variable (interest rate, savings, investment, or money supply). The study aims to examine the effects of Nigerian banks' interest rates on macroeconomic performance in both the long and short run.

The study aimed to evaluate the impact of interest rates on savings, investment, money supply, and output in the long and short run. The hypotheses formulated were:

- H1: *Interest rate has a significant impact on savings.*
- H2: *Interest rate has a significant effect on investment*
- H3: *Interest rate has a significant impact on money supply.*
- H4: *Interest rate has a significant effect on output*

2. METHODS

The research design used was a historical design, in which data were already available and could not be manipulated. Our secondary source of data collection was the Central Bank of Nigeria's statistical bulletin for interest rates (monetary policy rate, treasury bill rate, and deposit rate) and macroeconomic performance (savings, investment or gross fixed capital formation, money supply and gross domestic product). The study investigates the links among interest rates and macroeconomic variables using the Unit root test, Co-integration test, and Vector error correction model. The au-

thors have not used the data in previous publications. The study used twenty-three (23) commercial banks in Nigeria. The scope of the study was from 1990- 2024. The relationship between macroeconomic variables and the interest rate is expressed functionally:

$$MACV = f(INR), \quad (1)$$

where $MACV$ = macroeconomic variables; INR = interest rate.

We used monetary policy, treasury bills, and deposit rates as exogenous variables against savings, investment, money supply, and output, and decomposed the relationship into four equations:

$$SAV = f(MPR, TBR, DR), \quad (2)$$

$$GFCE = f(MPR, TBR, DR), \quad (3)$$

$$MS = f(MPR, TBR, DR), \quad (4)$$

$$GDP = f(MPR, TBR, DR), \quad (5)$$

where SAV = Savings (measures the total amount of money set aside by households, businesses, and the government that is not spent on current consumption); $GFCE$ = Gross Fixed Capital Formation or Investment (measures the total value of fixed assets acquired or created by businesses, governments, and households within a specific period); MS = Money Supply (measures the total amount of money circulating in an economy by banks at a given time). GDP = Gross Domestic Product or Output (a comprehensive indicator of a nation's economic activity and growth); MPR = Monetary Policy Rate (measures the interest rate set by a Central bank to influence the overall direction of monetary policy); TBR = Treasury bill rate (measures the interest rate set by a Central bank and earned by investors for purchasing short-term government securities); DR = Deposit Rate (measures the interest rate paid by commercial banks to depositors for holding their funds).

The above function can also be represented in a linear econometric format, thus:

$$SAV = C_0 + C_1MPRt + C_2TBRt + C_3DRt, \quad (6)$$

$$GFCE = C_0 + C_1MPRt + C_2TBRt + C_3DRt, \quad (7)$$

$$MS = C_0 + C_1MPRt + C_2TBRt + C_3DRt, \quad (8)$$

$$GDP = C_0 + C_1MPRt + C_2TBRt + C_3DRt, \quad (9)$$

where C_0 is the constant term, while other parameters (C_1MPRt , C_2TBRt , and C_3DRt) remain the same as defined earlier.

This study employed the Vector Error Correction Mechanism (VECM) approach to estimate the relationships between the study's variables. If there's evidence of cointegration in the model, a valid error correction model exists among the variables, which necessitates running one. In other words, if all series are integrated of order I (1), the study proceeds to estimate the relationships among the variables using the VECM approach. The VECM is estimated using the three endogenous variables:

$$\Delta \ln SAV_t = \sum_{l=1}^{P=1} \rho_l \Delta DR_{t-l} + \sum_{l=1}^{P=1} \rho_l \Delta MPR_{t-l} + \sum_{l=1}^{P=1} \rho_l \Delta TBR_{t-l} + Z2 \cdot ECM1_{t-1} + e_{1t}, \quad (10)$$

$$\Delta \ln GFCE_t = \sum_{l=1}^{P=1} \alpha_l \Delta DR_{t-l} + \sum_{l=1}^{P=1} \alpha_l \Delta MPR_{t-l} + \sum_{l=1}^{P=1} \alpha_l \Delta TBR_{t-l} + Z1 \cdot ECM2_{t-1} + e_{2t}, \quad (11)$$

$$\Delta \ln MS_t = \sum_{l=1}^{P=1} \varepsilon_l \Delta DR_{t-l} + \sum_{l=1}^{P=1} \varepsilon_l \Delta MPR_{t-l} + \sum_{l=1}^{P=1} \varepsilon_l \Delta TBR_{t-l} + Z3 \cdot ECM3_{t-1} + e_{3t}, \quad (12)$$

$$\Delta \ln GDP_t = \sum_{l=1}^{P=1} \lambda_l \Delta DR_{t-l} + \sum_{l=1}^{P=1} \lambda_l \Delta MPR_{t-l} + \sum_{l=1}^{P=1} \lambda_l \Delta TBR_{t-l} + Z1 \cdot ECM4_{t-1} + e_{4t}, \quad (13)$$

where ρ_l , α_l , ε_l , and λ_l = Short-run coefficients; $ECM1$, $ECM2$, $ECM3$, and $ECM4$ are the respective Error correction terms; e_{1t} , e_{2t} , e_{3t} , and e_{4t} = Residuals in equations (10), (11), (12), and (13), respectively. $ECM1_{t-1}$ = Lagged value of the residuals derived from the Cointegration regression of MPR ,

TBR, and DR on SAV; $ECM2_{t-1}$ = Lagged value of the residuals derived from the Cointegration regression of MPR, TBR, and DR on GFCF; $ECM3_{t-1}$ = Lagged value of the residuals derived from the Cointegration regression of MPR, TBR, and DR on MS; $ECM4_{t-1}$ = Lagged value of the residuals derived from the Cointegration regression of MPR, TBR, and DR on GDP.

Negative and significant $ECM1_{t-1}$, $ECM2_{t-1}$, $ECM3_{t-1}$, and $ECM4_{t-1}$ coefficients imply that there is long-run causality from the independent variables, MPR, TBR, and DR, to the dependent variables SAV, GFCF, MS, and GDP.

3. RESULTS

To determine the stationarity or non-stationarity of the data, a unit root test was conducted using the Augmented Dickey-Fuller test, as shown in Table 1. The stationarity test checks whether the time series data exhibits a constant mean, constant variance, and autocovariance, and is free from spurious results. Therefore, all variables used were stationary at 1(1).

Table 1. Augmented Dickey-Fuller (ADF) unit root test

Source: EViews 9.1 computation.

Variables	ADF Test Statistics		Order of integration
	Level	1 st Difference	
LGDP	-2.121664	-5.504962	1(1)
LSAV	-0.750421	-4.967351	1(1)
LGFCF	0.21977-00	-5.764508	1(1)
LMS	-0.906405	-10.18412	1(1)
MPR	-2.272018	-7.081586	1(1)
TBR	-2.055708	-7.591661	1(1)
DR	-2.041778	-6.590276	1(1)

Test critical values at level:
1% = -4.581152, 5% = -3.92662, 10% = -3.601424
Test critical values at 1st Diff:
1% = -4.584743, 5% = -3.928142, 10% = -3.602225

The co-integration test results in Table 2 indicate four co-integrating equations in the model. The test statistic values for both the trace test and the maximum eigenvalue test exceed their critical values at the 5% significance level. Additionally, the p-values of the co-integrating equations are less than 5%, indicating that the variables share a com-

mon stochastic trend and will grow proportionally. In other words, they move together in the long run, suggesting a long-run association.

Table 2. Unrestricted co-integration rank test

Source: Researchers' EViews 9.1 computations.

Unrestricted Co-integration rank test (Trace)				
Hypothesized		Trace	0.05	Probability**
No. of CE(s)	Eigenvalue	Statistic	Critical Value	
None*	0.891839	255.0427	125.6154	0.0000
At most 1*	0.739428	159.4049	95.75366	0.0000
At most 2*	0.607783	101.5752	69.81889	0.0000
At most 3*	0.526619	61.32979	47.85613	0.0017
At most 4	0.342430	29.17204	29.09707	0.0589
At most 5	0.186959	11.14627	15.49471	0.2027
At most 6	0.050900	2.246371	3.841466	0.1339

Unrestricted Co-integration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	Probability**
No. of CE(s)	Eigenvalue	Statistic	Critical Value	
None*	0.891839	95.63776	46.23142	0.0000
At most 1*	0.739428	57.82970	40.07757	0.0002
At most 2*	0.607783	40.24545	33.87687	0.0076
At most 3*	0.526619	32.15775	27.58434	0.0120
At most 4	0.342430	18.02577	21.13162	0.1289
At most 5	0.186959	8.899895	14.26460	0.2946
At most 6	0.050900	2.246371	3.841466	0.1339

Note: * denotes rejection of the hypothesis at the 0.05 level; ** MacKinnon-Haug-Michelis (MacKinnon et al., 1999) p-values. Trace test indicates 4 cointegrating eqn(s) at the 0.05 level. The max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level.

After estimating the VECM, the study created system equations to visualize the probabilities of the estimates, as shown in Table 3. In the same table, the error correction terms that track how quickly the money supply, investment, and gross domestic product are adjusted toward long-term equilibrium are C(1), C(20), C(39), and C(58). Our analysis confirmed that C(1), C(20), C(39), and C(58) were negative and significant at a 5 %, both as anticipated and in line with our findings. This result suggests a long-run causal relationship in which monetary policy, treasury bills, and deposit rates influence Gross Domestic Product (GDP), investment, and the money supply. A strong long-run causal relationship existed between interest rates, such as those associated with monetary policy, treasury bills, and deposit rates, and macroeconomic variables, including

Table 3. Long-run error correction analysis

Source: EViews 9.1 computations.

Endogenous Variable: LGDP				Endogenous Variable: LSAV			
Variables	Coefficient	t-stats	p-value	Variables	Coefficient	t-stats	p-values
C (1)	−0.48985	−2.31238	0.0293	C (20)	−0.01912	−0.73741	0.4677
R-Square		0.54045		R-Square		0.47265	
F-Statistics		2.6397	0.0217*	F-Statistics		1.2447	0.30106
Endogenous Variable: LGFCF				Endogenous Variable: LMS			
Variables	Coefficient	t-stats	p-value	Variable	Coefficient	t-stats	p-value
C (39)	−0.16559	4.25940	0.0003	C (58)	−0.05094	−2.10251	0.0457
R-Square		0.637207		R-Square		0.94424	
F-Statistics		2.439432	0.01989*	F-Statistics		23.5183*	0.0000

Note: * represents significant F-statistics at 5%.

the money supply, investment, and gross domestic product. However, C (20) was negative but not statistically significant at the 5% level.

The short-term causality of the deposit rate, treasury bill, and monetary policy rate was investigated using the system equation results in Table 4. The Wald test result, displayed in Table 4, shows no short-run causality from the monetary policy rate, treasury bill rate, and deposit rate to GDP. Our results show that none of the null hypotheses for the GDP equation were rejected, indicating that in the short run, the lags in the monetary policy rate, treasury bill rate, and deposit rate collectively had no significant effect on GDP. Furthermore, no short-term causality existed between monetary policy, treasury bills, deposit rates, and savings. We rejected all null hypotheses in the savings equation, indicating that we found no evidence that

lags one and two of the monetary policy, treasury bills, and deposit rate collectively influence short-run changes in savings. Additionally, there was no short-term causality between monetary policy, the treasury bill rate, the deposit rate, and investment. This may mean that all the null assumptions of the investment equation were accepted. This indicates that, in the short run, lags one and two of the monetary policy rate, the rate on treasury bills, and the deposit rate do not cause a change in investment. Finally, there was no direct short-term causal relationship between deposit rates and the money supply. We failed to reject the null hypothesis, indicating that the lagged variables of the deposit rate (at lags one and two) do not jointly cause short-run changes in the money supply. However, a short-run causality existed between monetary policy, treasury bill rates, and money supply. The null hypotheses were rejected, revealing that the

Table 4. Analysis of the short-run causality using the Wald test

Source: EViews 9.1.

Endogenous Variable: GDP (Output)				Endogenous Variable: SAV (Savings)			
Null Hypotheses	Interest rate	F-Stats	Prob.	Null Hypotheses	Interest rate	F-Stats	Prob.
C(13) = C(14) = 0	MPR	0.0677	.9347	C(32) = C(33) = 0	MPR	0.8246	0.4500
C(15) = C(16) = 0	TBR	0.6521	.9370	C(34) = C(35) = 0	TBR	0.2613	0.7715
C(17) = C(18) = 0	DR	1.0464	0.3661	C(36) = C(37) = 0	DR	0.8650	0.4333
Endogenous Variable: GFCF (Investment)				Endogenous Variable: MS (Money supply)			
Null Hypotheses	Interest rate	F-Stats	Prob.	Null Hypotheses	Interest rate	F-Stats	Prob.
C(51) = C(52) = 0	MPR	0.10041	0.9048	C(70) = C(71) = 0	MPR	15.173*	0.000
C(53) = C(54) = 0	TBR	0.54502	0.6521	C(72) = C(73) = 0	TBR	9.252*	0.001
C(55) = C(56) = 0	DR	2.18038	0.1340	C(74) = C(75) = 0	DR	0.5411	0.588

Note: * represents rejection of null hypotheses at 5%.

lagged values of the monetary policy rate and the treasury bill rate (at lags one and two) jointly drive short-run changes in the money supply.

The analysis reveals that the alternative hypothesis stating that interest rate has a significant impact on savings is rejected since the calculated F-statistics of 1.2447 is less than the table F-statistics value of 2.145 at 5 percent level of significance. Therefore, hypothesis *H1* is not supported. It therefore implied that interest rate did not have significant effect on savings. Likewise, Hypothesis *H2*, which states that the interest rate has a significant impact on investment, is supported. since the calculated F-statistics of 2.439 is greater than the table F-statistics value of 2.145 at 5 percent level of significance. In the vein, Hypothesis *H3*, which states that interest rate has a significant impact on money supply, is supported because the calculated F-statistics value of 23.518 was greater than the table F-statistics value of 2.145 at 5 percent level. Finally, Hypothesis *H4*, which states that interest rate has a significant effect on output, is supported. The reason being that the calculated F-statistics value of 2.639 was greater than the table F-statistics value of 2.145 at 5 percent level of significance.

4. DISCUSSION

The results showed that interest rates account for 47.27% of the observed changes in savings in the long-run. The overall significance of the model, with a value of 1.2447 and a t-value of 0.73742 ($p > 0.05$), indicates that the savings equation was not statistically significant. There was an absence of a long-run causal relationship among the rates of monetary policy, treasury bills, and deposits to savings, indicating that savings in Nigeria were unaffected by interest rates. The analyses of interest rates and savings showed that, both in the short and long run, interest rates have no discernible or appreciable impact on savings. Interpreted differently, alterations or changes in interest rates do not affect the amount of savings in Nigeria. Moreover, customers and business owners may prefer alternative savings vehicles, such as virtual microfinance banks, real estate, stocks, or informal savings groups (Osusu cooperatives), over traditional bank deposits. Also, limited access to

formal banking services could reduce the impact of interest rates (MPR, TBR, and DR) on savings. The results of this study were consistent with those of Simon-Oke and Jolaosho (2013), who evaluated the effect of real interest rates on gross fixed capital formation, savings mobilization, and economic growth and found that the real interest rate did not impact savings. Other supporting findings were Lee and Werner (2023), Badiea et al. (2019), Tibinyane and Kaulihowa (2021), Mirza and Rashidi (2018), and Ani et al. (2024).

Moreover, the results showed that interest rates account for 63.72% of the observed changes in investment. The overall significance of the model, with a value of 2.439432 and a t-value of 4.25940 ($p < 0.05$), indicates that the investment equation is statistically significant. There is a substantial long-term association between interest rates and investment. Additionally, rising interest rates may strengthen the national currency, making exports more expensive and less competitive, which further diminishes investment in export-oriented sectors. Rising interest rates do not immediately affect investment in Nigeria. Higher interest rates tend to reduce investment. Additionally, interest rates can significantly impact Nigeria's long-term economic trajectory by influencing investment levels, which in turn affect productivity, output, and employment. Conversely, interest rates do not affect investment in Nigeria in the short run. This implies limited responsiveness to monetary policy, meaning that the Central Bank's short-term interest rate adjustments may not effectively influence investment decisions; rather, investment decisions may be driven by other factors. The findings are corroborated by Modestui and David (2021), Babalola (2021), Adegoke et al. (2021), and Olayinka (2021), who collectively investigated trends in interest rates, investment, and GDP growth relationships.

The study found that interest rates account for 94.42% of the observed changes in the money supply. The overall significance of the model, with a value of 23.5183 and a t-value of 2.10251 ($p < 0.05$), indicates that the money supply equation is statistically significant. The interest rate has a significant long-run and short-run effect on the level of the money supply. This suggests that monetary policy is effective on both long-run and short-run

bases. The central bank's ability to influence the money supply through interest rates can have a significant impact on the economy. Interest rates facilitate financial stability in terms of asset prices, exchange rates, and the overall financial position of commercial banks. The findings align with existing studies, which emphasize the impact of interest rates on the money supply (Ovat et al., 2022; Karimo, 2020; Iqbal & Jamil, 2015). The study aligns with Okoi et al. (2022) and Ebiringa (2012), who argue that interest rates have a significant relationship with the money supply in Nigeria, suggesting that short-run interest rate changes can influence business investment decisions and consumer borrowing and spending habits. That is, the liquidity in the financial system could be easily managed and controlled; adjustments in interest rates may facilitate the stabilization of the economy during fluctuations, influencing borrowing costs and aggregate demand.

Finally, the results showed that interest rates account for 54.05% of the observed changes in out-

put (GDP). The overall significance of the model, with a value of 2.6397 and a t-value of 2.31238 ($p < 0.05$), indicates that the output equation is statistically significant. This suggests that monetary policy decisions have a considerable impact on economic performance. That is, the output channel of monetary transmission is resilient, and the economy is sensitive to strong monetary tightening. The result is in tandem with Obamuyi (2009), Ajuda and Okonkwo (2015), and Inam and Isaac (2022), who examined the connection between interest rates and economic growth in Nigeria, and found that lending rates had a significant impact on economic growth. The research also concurs with Inyama (2013), Kinyanjui et al. (2021), and Afful and Kamasa (2020), who examined interest rates and macroeconomic variables. It was found that interest rates have a significant long-run impact on Nigeria's economic growth. The findings of this study highlight the significant role that banks' interest rates play in shaping individuals' economic well-being and promoting sustainable economic performance.

CONCLUSION

The study aims to examine the effects of Nigerian banks' interest rates on macroeconomic performance in both the long and short run. The empirical analyses revealed that interest rates exerted insignificant effects on savings in both the long run and short run. However, interest rates exhibited a significant long-run effect but an insignificant short-run effect on output. Similarly, interest rates had a significant long-run but insignificant short-run impact on investment, while exerting significant effects on the money supply in both the long run and the short run. These findings suggest weak or ineffective monetary policy transmission, as the interest rate channel – operating through the Central Bank of Nigeria's policy instruments and commercial banks' lending and deposit rates – appears insufficient in influencing savings behavior as intended. Specifically, the interest rate environment prevailing during the study period did not significantly affect individuals' propensity to save. This outcome may reflect prevailing saving preferences among Nigerians, who tend to favor informal saving mechanisms, such as holding cash outside the banking system, due to ease of access and convenience.

Furthermore, the results indicate that Nigeria's output, measured by gross domestic product, does not respond immediately to changes in interest rates. Nevertheless, sustained increases in interest rates may adversely affect output levels over time by dampening aggregate economic activity. Investment, on the other hand, was found to be sensitive to interest rate movements in the long run. In particular, gross fixed capital formation decisions are significantly influenced by interest rates, with lower rates likely to stimulate investment, while persistently higher rates may discourage investors. Additionally, the findings underscore the effectiveness of the Central Bank of Nigeria in influencing the money supply and overall economic activity through monetary policy instruments such as the monetary policy rate, treasury bill rates, and deposit rates. These instruments collectively affect savings, investment, output, and capital formation within the financial system. Consistent with theoretical expectations, an increase in the monetary policy rate is associated with a contraction in the money supply.

The study concluded that the Central Bank of Nigeria should reduce high lending rates and large loan-deposit margins to enable commercial banks and other productive sectors to operate effectively and profitably. Financial authorities should also continue to support weak market mechanisms through effective monitoring and regulation of interest rates, thereby fostering a stable and resilient banking system. Moreover, monetary authorities should strike an appropriate balance between money supply growth and interest rate levels to reduce the overall cost of funds in the economy. Finally, further research is recommended for countries outside the African continent to examine the determinants of macroeconomic performance in different regional contexts. Such comparative studies would contribute to the formulation of continent-specific and globally informed macroeconomic policies and practices.

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