

# Impact of interest rate on inflation in selected Sub-Sahara African countries (2000 to 2023)

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Article History	Abstract
<b>Original Research Article</b>	<p><i>This study investigates the impact of interest rates on inflation across seven Sub-Sahara African countries from 2000 to 2023, employing a dynamic panel data approach. The study employed cross-sectional dependence tests, second-generation panel unit root tests (CIPS), Pedroni cointegration, and Vector Error Correction Model (VECM) to analyse the short-run and long-run dynamics. The correlation results show that deposit interest rate has a moderate positive correlation with inflation (0.68), while real interest rate exhibits a negative correlation (-0.53). Short-run VECM estimates indicate that real interest rate negatively affects inflation (-0.303), whereas deposit interest rate (0.488) and broad money supply (0.398) positively influence inflation. The error correction term (-0.146) is statistically significant, indicating that 14.6% of previous period disequilibrium is corrected annually. Long-run cointegrating estimates show that a 1% increase in real interest rate reduces inflation by 1.28%, while a 1% increase in deposit interest rate raises inflation by 3.95%. Broad money supply exerts a positive long-run effect (0.39%). Diagnostic tests confirm no serial correlation, normality of residuals, and homoscedasticity. The findings validate the Fisher effect in the long run while revealing paradoxical short-run dynamics consistent with Neo-Fisherian and cost-channel theories.</i></p> <p><b>Keywords:</b> Broad Money Supply, Pedroni Cointegration, Deposit Interest Rate, Real Interest Rate, Inflation.</p>
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## 1.1 Background to the study

The relationship between interest rates and inflation represents one of the most contentious and widely debated topics in monetary economics. Central banks worldwide employ interest rate adjustments as a primary tool to control inflationary pressures, yet the efficacy of this mechanism remains theoretically and empirically contested (Abouzeid, 2026). The conventional view, rooted in the Taylor rule framework which posits that increasing interest rates dampens aggregate demand by raising borrowing costs, thereby reducing spending and ultimately lowering inflation (Kruskovic, 2026). However, this seemingly straightforward relationship becomes considerably more complex when examined across different economic contexts time horizons.

The theoretical foundations of this debate trace back to Fisher's (1930) classical hypothesis, which posits that

nominal interest rates adjust one-for-one with expected inflation to maintain stable real returns. This Fisher effect suggests a positive long-run relationship between interest rates and inflation, contradicting the conventional policy wisdom that higher rates suppress inflation (Nemati & Tavakoli Moghaddam, 2026). More recently, Neo-Fisherian theorists have extended this logic, arguing that raising nominal interest rates actually increases inflation expectations and ultimately actual inflation, challenging central banks' conventional tightening policies (Cochrane, 2016; Uribe, 2022).

Empirical evidence on this relationship remains equally divided. Studies across developed economies have shown mixed results, with Patel (2022) demonstrating that interest rate adjustments in the United States and European Union have immediate effects on inflation expectations, while

Nakano and Meade (2021) found that emerging markets experience more complex transmission mechanisms. In developing economies like Nigeria, research by Azubike and Roland (2023) revealed that interest rates and liquidity ratios negatively impact inflation, yet Korgbeelo and Nwiado (2021) found that monetary policy rates and money supply showed only limited influence on inflationary trends.

The divergence in empirical findings often stems from crucial distinctions between short-run and long-run dynamics, as well as between nominal and real interest rates. Abouzeid (2026) demonstrated in the Egyptian context that while nominal interest rates may paradoxically increase inflation in the long run, real interest rates effectively curb inflationary pressures through genuine demand constraints. Similarly, Nwosu (2026) found that interest rates and reserve requirements demonstrated limited effectiveness in the long run, with weak short-run causality with inflation in Nigeria, suggesting that structural economic factors may dominate monetary policy transmission.

Furthermore, industry-level heterogeneity significantly shapes this relationship. Nemati and Tavakoli Moghaddam (2026) revealed that capital-intensive industries such as basic metals and chemicals exhibit strong negative responses to interest rate increases, while defensive sectors like pharmaceuticals show minimal sensitivity, as these industries possess greater ability to transfer costs to consumers. This sectoral variation underscores the complexity of monetary policy transmission across different economic structures.

Thus, the ongoing theoretical and empirical controversies surrounding interest rate-inflation dynamics, particularly in developing economies facing structural constraints, external shocks and institutional weaknesses, motivates continued investigation into this fundamental relationship with significant implications for monetary policy effectiveness. Hence this study investigates the impact of interest rate on inflation for the group of seven (7) African countries namely Angola, Botswana, Ghana, Madagascar, Sao Tome and Principe, Nigeria and South Africa over the period of 2000 to 2023 employing the dynamic panel method of analysis to take care of the time dynamics. The paper contains five sections in which the section is the background followed by second section which describes the various related literature on the topic. Section three is the research methodology detailing the data source and econometric methodology used for the study. Results and discussions of the findings are presented in Section 4 while Section 5 presents conclusions and policy recommendation for the paper.

## 2. Literature review

### 2.1 Empirical Literature Review

Several empirical studies have examined the relationship between inflation and exchange rate dynamics, with particular attention to the role of monetary policy in influencing price stability. For instance, Nwosu (2026) investigated the effects of monetary policy instruments on inflationary trends in Nigeria over the period 2000–2025 using the Vector Error Correction Model (VECM). The study found that deviations from long-run inflation equilibrium were corrected at an annual adjustment rate of 40.3%. Furthermore, the results revealed a significant positive relationship between money supply and inflation in both the short run and the long run. In contrast, interest rates and Cash Reserve Requirements (CRR) exhibited limited long-term effectiveness and weak short-run causal influence on inflation. The Granger causality analysis further indicated the existence of unidirectional causal relationships between money supply and inflation, as well as between interest rates and reserve requirement ratios.

Similarly, Silmina et al. (2026) examined the association between inflation and rice prices in Tulungagung Regency during the period 2021–2022. The study utilized monthly secondary data on inflation rates and rice prices obtained from official publications of the national statistical agency. Adopting a quantitative research framework, the researchers employed Pearson correlation analysis to evaluate both the direction and strength of the relationship between the variables. The findings revealed a correlation coefficient of 0.746 with a significance value of 0.000 ( $p < 0.05$ ), indicating a strong and statistically significant positive relationship between inflation and rice prices. The results therefore suggest that increases in inflation were generally accompanied by corresponding increases in rice prices throughout the study period.

Zerbo & Hien (2026) analysis the existence of the U-shaped Curve of Inflation relative to Interest Rates from the United States of America using Quarterly data covering Q1 2010 to Q1 2025 (57 observations). Autoregressive Distributed Lag (ARDL) bounds test for cointegration to estimate both short-run and long-run relationships. Findings from the study confirm the existence of U-shaped Relationship between inflation and interest rate. Thus, the inflation-real interest rate curve exhibits a U-shape in both the short and long term. Long-term coefficients: real interest rate (-0.477, significant at 1%), square of interest rate (+0.091, significant at 5%). The ceiling real interest rate (the rate above which inflation rises with further rate increases) is identical in both short and long term at 2.62%. This uniqueness ensures continuity in policy effects over time. The observed maximum real interest rate over

2022q1-2025q1 (4.24%) exceeds the estimated ceiling (2.62%) by a factor of 1.6. Therefore, when prevailing rates exceed this ceiling, reducing interest rates would curb inflation by stimulating working capital and supply, while further tightening would exacerbate inflation. The influence of the control variables on inflation indicates that, Wage growth has Positive effect on inflation (both short and long term), Exports has Positive effect on inflation (coefficient 217.6 in long term) while Imports has Negative effect on inflation (short-term significant, long-term zero).

Abouzeid (2026) Evaluating the efficiency of interest Rate policy in Controlling Inflation in Egypt using annual time series data over the period of 1976 to 2023. Pesaran (2007) ARDL bounds test for cointegration and causality method was employed to test the relationship between dependent and independent variables. The Short-run dynamics results reveals that, Nominal interest rate has No significant effect on inflation ( $p=0.082 > 0.05$ ), Real interest rate is Positive and significant (+0.338), implying rate increases raise inflation in short run (counterintuitive). On the part of control variables, Exchange rate has the Largest positive impact (+3.018), depreciation highly inflationary, GDP is Positive and significant (+2.38e-11), demand-pull inflation while Money supply is Negative and significant (-0.202), contradicts theory (attributed to M2 vs M1 data limitations). On the other hand, the Nominal interest rate has Positive and significant (+1.275) - increasing nominal rates raises inflation, Real interest rate has Negative and significant (-0.905) - effective in controlling inflation, Exchange rate is Negative and significant (-1.107) - depreciation becomes deflationary long-term, Money supply is Positive and significant (+0.252) - consistent with quantity theory while GDP is Not significant. The Error correction term: -0.872 indicating that 87.2% of the error are adjusted annually to convert to equilibrium.

Firmansyah & Tartila (2026) Analysis the Role of Interest Rate, Exchange Rate, Imports, Exports and Money Supply on Inflation in Indonesia employing Monthly data from January 2015 to December 2024 (120 observations). The method of analysis employed are Correlation analysis and Multiple linear regression draw inference about the relationship between dependent and independent variables. Correlation results reveal that, Money supply: Negative correlation with inflation (-0.4528), Interest rate: Positive correlation with inflation (+0.5684), Imports: No significant correlation, Exports: Negative correlation with inflation (-0.1780) while Exchange rate: Negative correlation with inflation (-0.1919). On the other hand, multiple regression analysis result reveal that, Money Supply (-7.76): Negative relationship contradicts monetary theory—authors suggest this may reflect central bank's successful sterilization or that M2 includes less-liquid

assets, Interest Rate (+0.588): Positive relationship confirms that in Indonesia, higher rates are associated with higher inflation, supporting the "cost channel" where businesses pass higher borrowing costs to consumers, Imports (-3.376): Negative relationship reflects import competition suppressing domestic prices, Exports (+8.181): Positive relationship—strong exports reduce domestic supply, creating inflationary pressure (largest coefficient among all variables) and Exchange Rate (insignificant): Surprisingly no significant effect, possibly due to managed float system or data limitations (official vs. market rates).

Azubike and Roland (2023) conducted a study to examine the effects of monetary policy on inflation in Nigeria, focusing on the period between 1986 and 2023. The authors employed the Vector Autoregression (VAR) model for data analysis, utilizing EViews 12 econometric software. The findings revealed that monetary policy rate (MPR) and money supply had positive effects on inflation in Nigeria, indicating that increases in these variables lead to higher inflationary pressures. Conversely, the study found that interest rates and liquidity ratio exerted a negative effect on inflation, with the liquidity ratio being statistically significant. Based on these results, the authors stressed the need for the Central Bank of Nigeria to maintain a stable MPR to regulate inflation effectively. They also recommended that the monetary authority should focus on controlling cash movements and ensuring moderate money supply levels to avoid excessive inflationary pressures. These findings provide valuable insights into the role of key monetary policy tools in managing inflation in Nigeria, highlighting the complexities involved in achieving price stability in the country.

Musa (2021) investigated the impact of exchange rate volatility on inflation in Nigeria using annual time-series data spanning the period from 1986 to 2019. The study employed the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model alongside the Vector Error Correction Model (VECM) to analyze the relationship between the variables. The findings revealed that both money supply and the nominal exchange rate exerted a positive and statistically significant influence on the consumer price index, indicating that inflationary pressures in Nigeria are driven not only by monetary expansion but also by fluctuations in exchange rates. In contrast, Victor, Udo, and Abner (2020) examined the determinants of inflation in Nigeria using quarterly data covering January 1999 to December 2018 and applied the Autoregressive Distributed Lag (ARDL) technique. Their findings suggested that factors such as inadequate infrastructural development, exchange rate instability, political uncertainty, corruption, and multiple taxation practices play a more significant role in driving inflation

than money supply alone. The study further established the existence of causal relationships between these explanatory variables and inflation, while the ARDL estimates confirmed significant long-run and short-run associations among the variables.

## 2.2 Theoretical Framework

This study is anchored on the Neo-Fisherianism framework, a monetary policy perspective which posits that inflation expectations are the primary determinants of nominal interest rates, rather than interest rates being the principal drivers of inflation. According to this theory, central banks can influence long-term inflation outcomes more effectively by managing inflation expectations directly rather than relying solely on adjustments in policy interest rates. Under a temporary change in the inflation target, expected inflation is assumed to remain relatively stable. In such a situation, an increase in current inflation, as explained by the Phillips Curve relationship, leads to a rise in output. To sustain higher output levels, the economy requires a reduction in the real interest rate. Since expected inflation remains unchanged, achieving a lower real interest rate necessitates a decline in the nominal interest rate. However, when the inflation target change is more persistent, inflation expectations begin to rise, with the magnitude of the increase depending on the degree of persistence. As expected inflation increases, the Phillips Curve implies a smaller expansion in output, while the IS Curve suggests a correspondingly smaller reduction in the real interest rate. Consequently, the nominal interest rate may not need to decline as much as in the temporary scenario, and in some cases may even need to increase to maintain equilibrium. Thus, the Neo-Fisherian perspective highlights the critical role of inflation expectations in shaping the relationship between inflation, output, and interest rates within the economy.

## 3. Methodology

The study examines the effect of interest rates on inflation in seven African countries over the period 2000–2023 using a comprehensive panel econometric framework. The analysis incorporates dynamic panel data techniques, cross-sectional dependence tests, second-generation panel unit root tests based on the Cross-sectionally Augmented IPS (CIPS) procedure, Pedroni Cointegration Test, and the Vector Error Correction Model to evaluate both short-run and long-run relationships among the variables. The selection of the sample countries and study period was guided primarily by data availability and consistency. Furthermore, the period was characterized by frequent fluctuations in both interest rates and price levels, making it suitable for investigating the interaction between

monetary policy and inflation. Data used in the analysis were obtained from the World Bank database (WDI, 2023).

Before estimating the econometric model, it was necessary to examine the stationarity properties of the panel data and determine whether cross-sectional dependence existed among the sampled countries. Cross-sectional dependence refers to a situation in which observations across different cross-sectional units are interrelated, resulting in correlated residuals among countries within the panel. Ignoring such dependence may lead to biased and inconsistent estimation results. To address this issue, several cross-sectional dependence tests were conducted, including the Breusch-Pagan Lagrange Multiplier Test developed by Breusch and Pagan (1980), the Pesaran (2004) CD statistic, the Pesaran CD test, and the Baltagi (2005) bias-corrected scaled LM test. The outcome of these tests guided the selection of appropriate unit root procedures. In the absence of cross-sectional dependence, first-generation panel unit root tests such as Phillips–Perron, Augmented Dickey–Fuller, and Im–Pesaran–Shin could be applied. However, where cross-sectional dependence is detected, second-generation unit root tests become more appropriate.

The results reported in Table 2 indicate the rejection of the null hypothesis of cross-sectional independence at the 1% significance level, confirming the presence of cross-sectional dependence among the sampled countries. This finding implies that economic developments occurring in one country may influence outcomes in other countries within the panel. Consequently, second-generation panel unit root tests were employed to assess the stationarity of the data. Specifically, the study adopted the Cross-sectionally Augmented IPS Test proposed by Pesaran (2007), which is designed to account for cross-sectional interdependence in panel datasets.

As previously highlighted, the principal advantage of second-generation panel unit root techniques lies in their ability to effectively address the problem of cross-sectional dependence. By incorporating cross-sectional information into the testing procedure, these methods provide more reliable and robust stationarity results, thereby improving the validity of subsequent econometric analyses and long-run relationship estimations.

### 3.1 Model Specification

The empirical model for this research was adapted from the previous work of (Nwosu, 2026; Silmina et al. 2026) with modification of the variables to achieve the objectives of our study. Thus, the functional form of the econometric model of this study is specified in the following poverty fuel subsidy function;

$$inf = f(ritr, dir, exrt, gdppc, bms) \quad [3.1]$$

Where;

inf – inflation rate is a dependent variable

ritr – real interest rate

ditr – deposit interest rate

exrt – exchange rate

gdppc – gdp growth rate and

bms – broad money supply

The mathematical model [3.1] was specified into panel econometric model [3.2] as follows

$$inf_{i,t} = \beta_0 + \beta_1 ritr_{i,t} + \beta_2 ditr_{i,t} + \beta_3 exrt_{i,t} + \beta_4 gdppc_{i,t} + \beta_5 bms_{i,t} + \varepsilon_{i,t} \quad [3.3]$$

Where i – cross-sectional unit (countries)

t – time period

$\beta_0$  to  $\beta_4$  are the parameters to be estimated

$\varepsilon_{i,t}$  is the error term

The VECM specification of the model (3.3) is express in equation (3.4) as follows;

$$\Delta y_{i,t} = \Pi y_{i,t-k} + \sum_{k=1}^K \Gamma_{i,t} \Delta y_{i,t-k} + \beta x_{i,t} + \varepsilon_{i,t} \quad (3.4)$$

where  $\Delta y_{i,t}$  is the differenced variables,  $\Pi y_{i,t-k}$  is the long-run, error correction component,  $\Gamma_{i,t} \Delta y_{i,t-k}$  is the short-run dynamics,  $\beta x_{i,t}$  is the deterministic terms and  $\varepsilon_{i,t}$  is the error term.

### 3.2 Variables and their Measurement

Variable Name	Variable Description	Variable Measurement	Sources
Inflation rate	Inf	measured by the annual percentage change in consumer prices	WDI, 2023
Real interest rate	Rint	measured in the form of percentage	WDI, 2023
Deposit interest rate	Dint	measured in the form of percentage	WDI, 2023
Exchange rate	Exrt	Official exchange rate	WDI, 2023
GDP growth rate	Gdppc	Gross Domestic Product Per capita (GDPPC) adjusted to Purchasing Power Parity (PPP)	WDI, 2023
Broad money supply	Bms	In form of total money supply in a year	WDI, 2023

## 4. Result and discussion

**Table 4.1: Correlation Analysis**

	INF	RITR	DIR	EXR	GDPPC	BMS
INF	1	-0.53	0.68	-0.09	-0.12	-0.24
RITR	-0.53	1	-0.09	0.18	-0.17	-0.09
DIR	0.68	-0.09	1	0.16	-0.34	-0.41
EXR	-0.09	0.18	0.16	1	-0.18	-0.31
GDPPC	-0.12	-0.17	-0.34	-0.178	1	0.25
BMS	-0.24	-0.09	-0.41	-0.31	0.25	1

Sources: Author's computation, 2026

The correlation results on table 4.1 indicates no existence of strong correlation among the variables of the study. This help in avoidance of multicollinearity in the econometric model estimated for the relationship among the variables. Real interest rate and deposit interest rate are the variables showing the existence of moderate correlation with inflation while the rest of the variable shows Weak correlation with interest rate.

**Table 4.2: Cross-Section Dependence Test**

	INF	RITR	DIR	EXR	GDPPC	BMS
Breusch-Pagan LM	38.83238 (0.0103)**	32.95689 (0.0467)**	131.8246 (0.0000)***	387.1405 (0.0000)***	408.4306 (0.0000)***	106.6450 (0.0000)***
Pesaran scaled LM	2.751595 (0.0059)***	1.844988 (0.0650)*	17.10061 (0.0000)***	56.49670 (0.0000)***	59.78184 (0.0000)***	13.21532 (0.0000)***
Bias-corrected scaled LM	2.599421 (0.0093)***	1.692814 (0.0905)*	16.94843 (0.0000)***	56.34453 (0.0000)***	59.62966 (0.0000)***	13.06314 (0.0000)***
Pesaran CD	3.660767 (0.0003)***	1.114908 (0.2649)	9.371549 (0.0000)***	19.59478 (0.0000)***	20.15823 (0.0000)***	2.519977 (0.0000)***

Sources: Author's computation, 2026

The cross-sectional dependence results from table 4.2 reveal the existence of strong evidence of cross-sectional dependence reject the null at the 1% significance level for all variables except real interest rate in which the bias-corrected LM and Pesaran scaled LM test indicate a weak existence of cross-sectional dependence at 10% while pesaran CD test for RITR indicate no cross-section dependence.

**Table 4.3: CIPS Panel Unit Root Test**

	Level	First difference
INF	-2.48032 (<0.05)	-3.67071 (<0.01)
RITR	-3.99970 (<0.01)	-4.21785 (<0.01)
DIR	-3.05099 (<0.01)	-4.10669 (<0.01)
EXR	-2.30500 (<0.10)	-2.99323 (<0.01)
GDPPC	-1.75081 (>=0.10)	-2.53028 (<0.05)
BMS	-2.68320 (<0.01)	-6.68274 (<0.01)

Sources: Author's computation, 2026

The unit root results from table 4.3 indicates that, the variable of the study are stationary at level except GDPPC which is stationary at first difference. Thus, it confirms the existence of particular pattern of macroeconomic variable.

**Table 4.4: Co-integration test**

	Statistic	Prob.
Panel v-Statistic	1.463075	0.0717
Panel rho-Statistic	-0.294060	0.3844
Panel PP-Statistic	-6.910378	0.0000
Panel ADF-Statistic	-6.563804	0.0000

Sources: Author's computation, 2026

The result of Pedroni cointegration test presented in table (4.4) reveals strong evidence of cointegration among INF, RITR, DIR, EXR, GDPPC, and BMS across the panel of seven (7) African countries in the sample. The Panel PP and ADF tests (unweighted) provide strong evidence of cointegration even though, the weighted ADF test is weaker, possibly due to heterogeneity across countries. The panel v-Statistic has the probability value of 0.0717, Panel PP-Statistic has the probability value of 0.0000 and Panel ADF-Statistic has the probability value of 0.0000 indicating the rejection of null hypothesis of no cointegration at 10% and 1% confirming the existence of cointegration among the variables. Thus, we can proceed to estimate our VECM for long and short-run dynamics.

**Table 4.5: Lag Selection**

No. of lag	LogL	LR	FPE	AIC	SC	HQ
0	-1267.84	NA	934963.6	16.58614	16.605	16.594
1	-894.41	737.095*	7186.135*	11.71778*	11.757*	11.733*
2	-894.31	0.190	7271.480	11.72959	11.789	11.754

Sources: Author's computation, 2026

Note: \* Indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

From Table 2 all information criterion suggests one lag as appropriate lag for the estimation of our vector error correction and any subsequent analysis.

**Table 4.6: Short-run Vector Error Correction Estimates**

	Coefficient	Std. Error	t-Statistic	Prob.
ECT <sub>t-1</sub>	-0.145775	0.016361	-8.909817	0.0000
d(INF(-1))	-0.104085	0.043622	-2.386055	0.0183
d(RITR(-1))	-0.303284	0.052536	-5.772831	0.0000
d(DIR(-1))	0.488499	0.154019	3.171687	0.0019
d(EXR(-1))	0.002244	0.005202	0.431333	0.6669
d(GDPPC(-1))	4.95E-10	4.68E-10	1.058338	0.2917
d(BMS(-1))	0.398447	0.131361	3.033226	0.0029
C	-1.132329	0.528455	-2.142715	0.0338
R-squared	0.533049			
Adjusted R-squared	0.510350			
F-statistic	23.48339			
Prob(F-statistic)	0.000000			

Sources: Author's computation, 2026

The short-run estimation results indicate that the error correction term is negative and statistically significant at the 1 percent level, confirming the existence of a stable long-run equilibrium relationship among the variables. The estimated error correction coefficient of -0.146 suggests that approximately 14.6 percent of deviations from the previous period's equilibrium level of inflation are corrected within each adjustment period. This implies that the system gradually converges toward its long-run equilibrium following short-term disturbances. The findings further reveal that real interest rate, deposit interest rate, and broad money supply exert statistically significant effects on inflation in the short run. Specifically, the real interest rate exhibits a negative relationship with inflation, indicating that a one-unit increase in the real interest rate leads to a reduction of approximately 0.303284 units in the inflation rate.

Conversely, both deposit interest rate and broad money supply demonstrate positive and statistically significant effects on inflation. The results indicate that a one-unit increase in the deposit interest rate contributes to an increase of approximately 0.488499 units in inflation, while a corresponding one-unit increase in broad money supply raises inflation by about 0.398447 units. In contrast, exchange rate and gross domestic product per capita were found to have no statistically significant influence on inflation in the short run. The coefficient of determination (R<sup>2</sup>) of 0.533049 indicates that approximately 53.3 percent of the variation in inflation is explained by the explanatory variables included in the model. Furthermore, the overall model is statistically significant, as evidenced by the probability value of the F-statistic (0.0000), which is below the conventional 5 percent significance level, confirming the joint explanatory power of the selected variables.

**Table 4.7: Long-run Vector Error Correction Estimates**

Cointegrating Eq:						
INF(-1)	RITR(-1)	DIR(-1)	EXR(-1)	GDPPC(-1)	BMS(-1)	C
1.000000	-1.2768	3.949487	0.001128	6.98E-10	0.394252	-59.145
	(0.29068)	(0.42842)	(0.00264)	(2.4E-10)	(0.14514)	
	[-4.3924]	[9.21870]	[0.42664]	[2.86968]	[2.71632]	

Sources: Author's computation, 2026

Note: () and [] signifies the standard error and t-statistics respectively

The long-run cointegrating equation result in table ( ) reveals that, real interest rate has a negative and significant impact on inflation rate in the long-run. It shows that a 1% increase in RITR is associated with a 1.28% decrease in INF in the long run.

On the contrary, deposit interest rate has positive significant impact on inflation rate. The result shows that, a 1% increase in DIR is associated with a 3.95% increase in INF in the long run. Exchange rate EXR Very small positive (+0.0011) and not statistically significant effect on inflation rate. However, gross domestic product per capita has a negligible but significant positive effect on inflation rate in the long run. But broad money supply (BMS) has a positive significant effect on inflation rate in the long run, indicating 1% increase in BMS is associated with a 0.39% increase in INF in the long run. The Constant is (-59.145) which adjusts the long-run equilibrium level.

**Table 4.8: Diagnostic Tests Results**

Tests	Tests Statistics	P-values
VEC Residual Serial Correlation LM Tests	41.33784	0.2488
Jarque-Bera Normality Test	0.892	0.691
White Heteroskedasticity Test	1.758	0.204

The diagnostic test results in Table (4.8) reveals that, VEC Residual Serial Correlation LM Tests, Jarque-Bera Normality Test and White Heteroskedasticity Test have the probability values greater than 5% level of significance, showing absence of serial correlation, presence normality and homoskedastic error term.

### 5.1 Conclusion

This study examined the relationship between interest rates and inflation across seven African countries over the period 2000 to 2023 using dynamic panel econometric techniques. The findings reveal that the interest rate-inflation nexus is fundamentally different in the short run versus the long run. In the short run, real interest rates exert a negative and significant effect on inflation, while deposit interest rates and broad money supply demonstrate positive inflationary effects. Exchange rate and GDP per capita shows no statistically significant short-run impact. The negative and significant error correction term confirms that deviations from long-run equilibrium are corrected at an annual adjustment rate of approximately 14.6%.

In the long run, the result strongly supports the Fisher effect: real interest rates negatively and significantly influence inflation, with a 1% increase in real interest rates corresponding to a 1.28% decrease in inflation. Conversely, deposit interest rates exhibit a large positive long-run effect, suggesting that nominal rate increases may paradoxically fuel inflation over extended horizons—a finding consistent with Neo-Fisherian propositions. Broad money supply and GDP per capita also demonstrate positive long-run inflationary effects, though the latter is economically negligible. The absence of multicollinearity and successful diagnostic tests (no serial correlation, normality, homoscedasticity) validate the robustness of the estimates. Overall, the study concludes that monetary policy transmission in African economies is complex, time-dependent, and sensitive to the distinction between real and nominal interest rates.

### 5.2 Policy Recommendations

Based on the findings, the following policy recommendations are proffered:

- i. Central banks in the sampled African countries should focus on maintaining positive and stable *real* interest rates rather than nominal rates, as real rates demonstrate consistent inflation-reducing effects in both the short and long run.
- ii. Given that deposit interest rates exhibit positive inflationary effects in both time horizons, policymakers should avoid aggressive increases in deposit rates as a standalone inflation-control measure, as this may produce counterproductive outcomes through cost-push channels.
- iii. The significant positive effect of broad money supply on inflation suggests that monetary authorities should coordinate closely with fiscal authorities to manage liquidity expansion, particularly in environments where money supply growth is driven by deficit financing.

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