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Impact of Monetary Policy Transmission Channel on Inflation in Nigeria: 1999-2024

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Abstract

Policymakers and scholars continue to have extensive conversations about the relationship between interest rates and inflation in Nigeria. This is because, despite the efforts of Nigerian policymakers and regulatory authorities to achieve a high level of sustainable growth, the economy continued to witness stunted growth over the years, primarily due to double-digit inflation that continuously erodes value. In light of this, this study looked at how interest rates transmission channel has affected Nigeria's inflation rate over the last 25 years. The research design for this study is ex-post facto, using time series data for 25 years between 1999- 2024. Data were obtained from the databases of the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), and the World Development Indicator (WDI). The study utilized the Autoregressive Distributed Lag (ARDL) model to analyze the effect of interest rates on inflation in Nigeria, while the Augmented Dickey-Fuller (ADF) and Phillip-Perron were employed for the stationarity test. The results of the analysis showed that interest rates have a long-run significant cointegrating relationship with the inflation rate. The study therefore recommends that the CBN could alternate its approach to managing inflation in Nigeria by regulating the amount of money in circulation in addition to solely utilizing the interest rates through the MPR's operation. Furthermore, since the CBN has little control over the other elements, monetary policy by itself is unable to reduce inflation in Nigeria. To guarantee the elimination of all barriers to reducing inflation in Nigeria, the report recommends that the monetary authority work in tandem with the fiscal authority and all pertinent ministries, departments, and agencies (MDAs).

Background to the Study

The rate of inflation in the economy and the way monetary impulses are transferred to the real sectors of the economy are two important topics in macroeconomics. The unique features of the channels through which monetary policy and interest rates are transmitted are of ongoing interest to scholars and policymakers. Fluctuations in interest rates have significant effects on the investment and saving decisions of businesses and individuals, which, in turn, affect the demand side of the economy. Before receiving revenue from the sale of their final goods, businesses rely on borrowing from banks and other financial intermediaries to finance their manufacturing expenses.

Monetary policy also affects the cost side of the economy because borrowing from financial intermediaries comes with a cost determined by interest rates. This is commonly known as the working capital channel of monetary transmission, as it is based on the notion that companies require working capital to conduct their operations. Given that monetary tightening may raise short-term interest rates, higher rates inevitably lead to increased costs for working capital and, consequently, higher inflation. Most countries aim to achieve both low and stable inflation and strong economic growth through their macroeconomic policies (Musa, 2021). Inflation is the general increase in the level of prices for goods and services in an economy. Many empirical studies have explored the beneficial and adverse impacts of inflation on the overall economy. This has led to intense debate in the literature on economics and finance (López & Mignon, 2021). Every economy should prioritize achieving commodity price stability, as it is widely acknowledged to be a prerequisite for sustained growth and development. Inflation acts as a major barrier to achieving this goal. Due to its detrimental effects on savings, investment, and price stability as well as its broader social and economic ramifications the primary objective of monetary policy should be to achieve low inflation, rather than to increase output or reduce unemployment (Zubair et al., 2022). Consequently, it is imperative to conduct a detailed analysis of inflation as a complex economic phenomenon, with particular attention to the mechanisms through which inflationary impulses enter the economy.

Several developing countries lack a comprehensive understanding of inflation, whereas industrialized nations are better informed about how inflation affects economic growth, what factors influence it, and the optimal inflation level for promoting growth (Davis & Zlate, 2019). According to empirical research, inflation negatively affects economic growth in the medium and long term (Kankpeyeng & Abubakar, 2021). Accordingly, Eggoh and Khan (2016) noted that no school of thought has embraced rising inflation due to its negative distributional and social consequences. However, the notion that a certain level of inflation is necessary for achieving and sustaining economic progress provides a counterpoint. For this reason, Thanh (2015) pointed out several potentially positive channels through which inflation may affect economic growth. Several key variables are major drivers of inflation, including the money supply, interest rate, national output, exchange rate, wage rate, trade openness, and inflation expectations (Bhattacharya, 2018). However, the precise nature of the relationship between interest rates and the

inflation rate in Nigeria has generated diverse opinions in the empirical literature, with several studies yielding conflicting results.

This paper, therefore, establishes the level and direction of the interaction between interest rates (proxied by the prime lending rate, monetary policy rate, and money supply growth) on one hand, and the inflation rate on the other. It also examines how changes in these interest rate proxies affect the dynamics of inflation in Nigeria. This research advances the existing literature in two key ways. First, it adopts the Autoregressive Distributed Lag (ARDL) model to analyze the data, in contrast to previous studies that evaluated the empirical fit of forward-looking models for inflation using the Generalized Method of Moments (GMM) estimator. The ARDL model offers an alternative that avoids some of the limitations associated with GMM estimates. Second, the paper introduces the money supply growth rate as a proxy for interest rates to account for the role of money supply in controlling inflation in Nigeria.

Literature Review

Conceptual Review

Interest Rate: An interest rate commonly referred to as the bank lending rate or prime lending rate is the minimum interest rate used by banks as a benchmark for determining the lending rates charged to customers (Bank Indonesia, 2015). Interest rates represent the price of using investment funds (loanable funds). They serve as a key indicator in determining whether an individual will choose to borrow or save (Boediono, 2015).

According to Adeneye (2021), the lending interest rate is the price a borrower pays for the use of money borrowed from a lender. It also refers to what banks charge each other for overnight loans. An interest rate is the proportion of a loan charged as interest to the borrower, typically expressed as an annual percentage of the loan outstanding. Interest refers to the cost of borrowing money or the reward for saving (Banton, 2020, as cited in Investopedia, 2021). It is the amount charged on top of the principal by a lender to a borrower for the use of the lender's assets (Central Bank of Nigeria, 2021).

Inflation: The concept of inflation is notoriously difficult to define due to the multi-dimensional nature of its causes. It can be generally described as an upward movement in the general price level, shared by all components of the price deflator such as the Consumer Price Index (CPI). According to Clement et al. (2021), inflation refers to a continuous rise in the general price level of goods and services, which usually results in a decline in the value of money in the affected economy. Similarly, Nnadi and Falodun (2019) define inflation as an economic situation characterized by rapidly and continuously rising prices, leading to a corresponding fall in the value of money.

Inflation also refers to a sustained and persistent upward trend in the general level of prices. Ahuja (2015) defines it as the persistent, sustained, and appreciable increase in the price levels of goods and services. It is a quantitative measure of the rate at which the average price level of a basket of selected goods and services in an economy rises over

time. Typically expressed as a percentage, inflation indicates a decline in the purchasing power of a nation's currency (Anyanwu, 2016). Based on its general causes, inflation can be classified into categories such as demand-pull, cost-push, and built-in inflation, among others. It can also be categorized by its speed and intensity. In this context, inflation may be described as creeping, walking, galloping, or hyperinflation (Northgate, 2019).

Empirical Review

Several recent studies have examined the relationship between interest rates and inflation. Von Wyngard et al. (2024) investigated the influence of money supply, interest rate, exchange rate, and oil prices on inflation in South Africa. Monthly data from January 2015 to September 2022 were employed. The independent variables were tested for multicollinearity, after which a multiple regression model was developed. The findings revealed that approximately 97% of consumer price index (CPI) movements were explained by the four macroeconomic variables. The study concluded that money supply and exchange rates had strong positive relationships with inflation and must be carefully managed. In contrast, interest rates and oil prices exhibited significant negative relationships with inflation, suggesting their incorporation into a broader macroeconomic policy framework. The paper emphasized the need to strike a balance between acceptable inflation levels that promote economic growth and those that lead to price instability.

Idisi (2024) conducted an empirical analysis of the impact of monetary policy on inflation in Nigeria, with a focus on the Central Bank of Nigeria's (CBN) effectiveness in curbing inflation amid rising prices. Utilizing secondary data, the study adopted an autoregressive distributed lag (ARDL) model for long-run analysis and an error correction model (ECM) for short-run dynamics. Theoretical underpinnings included the Quantity Theory of Money, Demand-Pull and Cost-Push Inflation theories, Structuralism, and Monetarism. Findings indicated that while monetary policy has played a significant role in managing inflation in Nigeria, its effectiveness has declined in recent times. For instance, inflation rose from 13.25% in 2020 to 24.08% in July 2023. Contributing factors included insecurity, flooding, insufficient rainfall, increased imports of raw materials, the farmer-herder crisis, and global shocks such as the Russia-Ukraine war issues beyond the control of monetary policy. The study recommended urgent action by the government to control imported inflation, particularly due to Nigeria's dependence on imports such as refined crude oil, raw materials, and agro-industrial equipment.

Onaga et al. (2024) examined the impact of monetary policy transmission channels on real sector performance in selected Sub-Saharan African countries from 1990 to 2020. Using the system generalized method of moments (Sys-GMM), the study found that credit and exchange rate channels positively influenced agricultural productivity, while the interest rate channel had a significant negative effect. Conversely, these same channels negatively impacted the manufacturing sector, and the interest rate channel

showed no significant influence. The study recommended that policymakers strengthen the effectiveness of monetary policy transmission to enhance outcomes in the productive sectors.

Lindiwe et al. (2023) investigated the relationship between interest rates and inflation in Swaziland using quarterly data from 2015 to 2021. Their analysis revealed a positive and statistically significant correlation between the two variables, implying that rising inflation was typically followed by increases in interest rates. This suggests a reactive monetary policy approach, where the central bank adjusts interest rates in response to inflationary pressures, rather than proactively curbing inflation before it escalates.

Onehi et al. (2023) assessed the effect of monetary policy on price stability in Nigeria over the 1986–2020 period using an ARDL bounds test and ECM estimation. The study aimed to identify which monetary policy tools were effective in ensuring price stability, given the apparent disconnect between CBN policy decisions and inflation outcomes. Stationarity tests showed that inflation (INF), exchange rate (EXR), and broad money supply (M_2) were integrated at 1(1), while the monetary policy rate (MPR) and real interest rate (RIR) were stationary at level, 1(0). The ARDL results confirmed long-run relationships among the variables, and the ECM coefficient (-0.0151) indicated a slow adjustment toward equilibrium. The Durbin-Watson statistic (2.2381) suggested no autocorrelation. The findings showed that EXR, M_2, and MPR had negative but insignificant effects on price stability, while RIR had a negative and significant effect. The study concluded that monetary policy had an insignificant impact on general price stability in Nigeria and recommended increased efforts to promote financial inclusion.

Musa (2021) explored the relationship between interest rates and inflation in Nigeria from 2007 to 2019. Employing unit root and Johansen co-integration tests, the study used multiple proxies for interest rates, including the monetary policy rate, maximum lending rate, and deposit rate. Results indicated that while interest rates had little short-term impact on inflation, they were more influential in the long run.

Okotori et al. (2020) investigated the link between CBN monetary policy and inflation in Nigeria using monthly data from 2009 to 2018. Applying ADF, Johansen co-integration, and VECM, the study found stationarity at I(1) for the variables and long-term relationships among them. The VECM results showed that the liquidity ratio, MPR, exchange rate, reserve requirement, and treasury bill rate significantly influenced inflation. The study concluded that CBN's monetary policy instruments were effective in influencing inflation dynamics.

Mirza and Rashidi (2020) examined the causal relationship between interest rates and inflation in SAARC countries using econometric methods under two different scenarios. In the first scenario, which analyzed the link between nominal lending rates and inflation, the study found no significant correlation, suggesting limited effectiveness of nominal interest rates in controlling inflation. However, in the second scenario, which

focused on real interest rates (adjusted for inflation), a significant causal relationship was observed. This indicates that real interest rates may serve as a more reliable tool for monetary policy aimed at influencing inflation in the SAARC region.

Theoretical Framework

Underpinning Theory

The classical quantity theory of money is one of the earliest theoretical propositions explaining price increases. The basic propositions of the classical quantity theory were later expounded upon by economists like Milton Friedman, Philip Cagan, Allan Meltzer, and Karl Brunner (Humphrey, 1974).

The quantity theory of money was popularized by the renowned American economist Irving Fisher. The theory establishes a link between the amount of money in circulation and the general price level of goods and services. According to Bakare-Aremu, Osobase, and Ohale (2018), the theory posits a direct relationship between the money supply and the price level, suggesting that the price level is proportional to the quantity of money in circulation. In the words of Irving Fisher, as cited in Jhingan (2016), "ceteris paribus, as the quantity of money in circulation increases, the price level also increases in direct proportion, and the value of money decreases, and vice versa." This implies that if the quantity of money is doubled, the price level will also double, and the value of money will be halved. Conversely, if the quantity of money is reduced by half, the price level will likewise be halved, and the value of money will double.

Mathematically, the theory can be written as;

$MV = PQ$

Where:

M = total money supply

V = velocity of the money in circulation

P = average price level

Q = real national output

Methodology

This paper adopted an ex-post facto research design to investigate the effect of interest rates on inflation in Nigeria. This design is appropriate given the nature of the study, which relies on historical data and does not involve manipulation of independent variables. The choice of this design is grounded in established theoretical frameworks that highlight the interrelationship between interest rates and inflation, and it aligns with methodological approaches adopted in prior empirical studies. Moreover, the availability of reliable secondary data further justifies its suitability. Notably, similar studies, such as Akadiri (2021), have effectively utilized the ex-post facto design to explore related macroeconomic phenomena, lending further credibility to its application in this context.

Method of Data Analysis

This paper examined how interest rates affect Nigerian inflation. The study employed both descriptive and inferential statistics to evaluate time series data. Statistical metrics including mean, minimum, maximum, and standard deviation were used to do the descriptive analysis. To assess the degree of correlation and identify any issues with multicollinearity among the explanatory variables, Pearson's Product Moment Correlation and

Variance Inflation Factor (VIF) were utilized

The time series properties of the variables were investigated using the unit root tests of the Phillip Pearson test, and the Augmented Dickey-Fuller test before the regression analysis was estimated. To estimate the time series regression, the study employed the linear Autoregressive Distributed Lag (ARDL) model. The following rationales support this econometric technique: firstly, variables with varying orders of cointegration can be employed with the ARDL approach. This happens, for instance, when variables have a mixed order of I(0) and I (1). Secondly, small, or finite sample sizes can be employed with the ARDL technique, (Pesaran & Smith 2001). Thirdly, simultaneous calculations are made for the long-run and short-run parameters. Finally, the technique can take time series data structural breaks into account.

Model Specification

The Quantity Theory of Money addresses the indirect relationship between interest and inflation through the amount of money in circulation, and this theory served as the foundation for the model used to calculate the effect of interest rates on inflation rates. For this reason, the study used and modified the empirical models based on the earlier research of, (Zulkhibri, & Rani (2016) and (Eggoh & Khan 2016) to create the functional relationship shown in equation (1) below:

$$INF = f(PLR, MPR, MS) \quad (1)$$

Where;
INF is the inflation rate,
PLR is the prime lending rate,
MPR is the monetary policy rate and
MSG is money supply growth

The estimable form of equation (1) is specified in equation (2).

$$INF_t = \beta_0 + \beta_1 PLR_t + \beta_2 MPR + \beta_3 MSG_t + \mu_t \quad (2)$$

Where the variables INF, PLR, MPR, and MSG, are as explained earlier in equation (1).
β_0 is the constant term and
μ_t is the disturbance term.

The parameters $\beta_i (I = 1, 2 \ldots, 3)$ are the coefficients of the respective variables.

The paper expected an increase in prime lending rate to have a negative effect on inflation. This may be the result of rising lending rate trends, which are linked to high borrowing costs and tend to discourage people from borrowing money from banks to boost investment and consumption. Inflation was also expected to be negatively correlated with high monetary policy rates and to rise in response to an expansion of the money supply. Finally, it was anticipated that lower inflation would result from higher institutional quality.

Result and Analysis
Descriptive Statistics and Correlation
Descriptive Statistics
Table 1: Descriptive Statistics of Interest Rates and Inflation

Variables	Mean	Maximum	Minimum	Std. Dev.	Obs
INF	12.122	21.340	4.100	3.845	68
PLR	16.027	19.420	11.200	2.010	68
MPR	11.504	16.170	6.000	2.484	68
MSG	4.031	27.691	-7.269	5.289	68

Source: Researcher's Computation 2025

Notes: Table 1 shows the mean, maximum, minimum, and standard deviation of the variables. The dependent variable is inflation (INF). The regressors are Prime Lending Rates (PLR), Monetary Policy Rate (MPR) and Money Supply Growth (MSG). The sample period is from 1999-2024 representing 25 years observations. The estimation process was facilitated using EVIEWS 12.

Table 1 shows the descriptive statistics of the variables used for the study. From the table, inflation has a mean value of 12.12 and a standard deviation of 3.85. The high standard deviation of 3.85 is an indication that inflation levels in Nigeria are highly susceptible to changes during the period. The minimum value of 4.10 and maximum value of 21.34 also indicated that Nigeria had very volatile inflation rates between 1999 and 2024.

The prime lending rate has a mean value of 16.03 and a standard deviation of 2.01. The relatively low standard deviation of 2.01 indicates that the prime lending interest rate was less susceptible to changes during the period while the minimum value of 11.2 and maximum value of 19.42 indicate that Nigeria has different levels of prime lending rate during the study period. The monetary policy rate has a mean value of 11.50 and a standard deviation of 2.48. The relatively low standard deviation of 2.48 is an indication that the monetary policy rate was less susceptible to changes between 1999 and 2024 while the minimum value of 6.00 and maximum value of 16.17 indicated that Nigeria has varying levels of monetary policy rate during the period. Money supply growth has a mean value of 4.03 and a standard deviation of 5.29. The relatively high standard deviation of 5.29 indicated that money supply growth is highly susceptible to changes

between the period of 1999 and 2024. The minimum value of -7.27 and maximum value of 27.69 indicated that Nigeria has very volatile levels of money supply growth and that both positive and negative money supply growths were recorded during the review period.

Pearson Correlation Analysis

This section discusses the relationship between the interest rate variables and the inflation rate in Nigeria. The study emphasizes the extent of the relationship between Monetary Policy Rate (MPR), Prime Lending Rates (PLR), and Money Supply Growth (MSG) on the one hand, and Inflation Rate (INF) on the other hand for the period between 1999 and 2024.

Table 2: Correlation Matrix for Interest Rates and Inflation Rate

Variables	INF	PLR	MPR	MSG	INSTQ	VIF
INF	1.000					N/A
PLR	-0.442	1.000				1.108
MPR	0.188	-0.236	1.000			2.517
MSG	0.177	-0.089	-0.110	1.000		1.040

Source: Researcher's Computation 2025

Notes: Table 2 displays the Pearson pairwise correlation matrix. The dependent variable is the Inflation Rate (INF). The regressors are the Prime Lending Rate (PLR), Monetary Policy Rate (MPR) and Money Supply Growth (MSG). The sample period is from 1999-2024 representing 25 years observations. The estimation process was facilitated using EVIEWS 12. The correlations are below the major diagonal and the last row titled VIF is the test for multicollinearity.

Interpretation

The results of the correlation analysis in Table 2 show that monetary policy rate and money supply growth have positive relationships with inflation in Nigeria. This implies that increases in monetary policy rate and money supply growth will lead to an increase in the level of inflation. The results also provided evidence that the prime lending rate has a negative relationship with the inflation rate in Nigeria. Thus, an increase in the prime lending rate will lead to a fall in the inflation rate. The test for multicollinearity was conducted and the variance inflation factor (VIF) for each of the explanatory variables was less than 10. The VIF were 1.108, 2.517, 1.040, and 2.415 for monetary policy rate, prime lending interest rate and money supply growth respectively. Therefore. the three regressors used in the estimated model were found to be uncorrelated with one another.

Result of the Stationarity Test

Stationarity tests were conducted to examine the time series properties of the variables over the study period. Specifically, the Augmented Dickey Fuller (ADF) and the Phillip-Perron (PP) unit root tests was used to evaluate for stationarity in the series and the result is presented in Table 3.

Table 3: Result of the Unit Root Test

Variables	ADF	PP	Remarks
INF	-2.448	-2.181	
ΔINF	-7.367***	-7.347***	I(1)
PLR	-2.001	-2.318	
ΔPLR	-6.871***	-6.861***	I(1)
MPR	-2.261	-2.443	
ΔMPR	-4.694***	-4.766***	I(0)
MSG	-5.847***	-8.547***	
ΔMSG	-10.634***	-37.186***	I(1)

Source: Researcher's Computation 2025

Notes: Table 3 presents the unit root test. The dependent variable is the Inflation Rate (INF). The regressors are the Prime Lending Rate (PLR), Monetary Policy Rate (MPR) and Money Supply Growth (MSG). The sample period is from 1999-2025 representing 25 years observations. The estimation process was facilitated using EVIEWS 12. The critical value at 5% for intercept and trend is -3.50 and for intercept alone is -2.93. ** and *** indicate significance at 5 and 1 percent, respectively.

Interpretation

From the unit toot test in Table 3, the stationarity tests were carried out on the data using ADF and PP. The test showed evidence that the inflation rate (INF) was stationary at first difference. This was because the unit root statistic for the ADF and the PP unit root tests were more negative than the critical values at a 5 percent level of significance. In addition, there was evidence that Prime Lending Rate (PLR) and Money Supply Growth (MSG) were also stationary at first difference while Monetary Policy Rate (MPR) was stationary at the level at the 5 percent level of significance.

Therefore, due to the different order of integration of the variables, the Autoregressive Distributed Lag (ARDL) model approach to cointegration of Pesaran and Pesaran (2001), which allows for the combination of levels and first difference stationary variables was adopted for the analysis. The adoption of the ARDL approach to cointegration was also because the short-run and the long-run dynamics of the specified model were estimated concurrently.

Test of Hypotheses

H_{01}: Interest rates have no significant effect on inflation in Nigeria.

Table 4: Interest Rates and Inflation

Panel A: Long Run Estimates

Dependent Variable: INF				
Variable	**Coefficient**	**S.E**	**t-stat**	**Prob**
C	66.047	18.743	3.524	0.001
PLR	-2.296	0.751	-3.057	0.004
MPR	-1.553	0.773	-2.009	0.050
MSG	0.456	0.414	1.102	0.276

Panel B: Short -Run Estimates

Variable	**Coefficient**	**S.E**	**t-stat**	**Prob**
D(INF(-1))	0.196	0.094	2.081	0.043
D(INF(-2))	0.245	0.095	2.574	0.013
D(PLR)	-0.128	0.091	-1.415	0.163
D(PLR(-1))	-0.115	0.202	-0.567	0.573
D(PLR(-2))	-0.029	0.222	-0.130	0.897
D(PLR(-3))	0.348	0.215	1.618	0.112
D(MPR)	0.765	0.208	3.684	0.001
D(MSG)	0.199	0.193	1.030	0.308
ECT(-1)	-0.177	0.035	-5.058	0.000

Panel C:

Diagnostic Tests	**Statistic**	**Prob.**
Bound Test	7.869	0.000
Adjusted R-square	0.480	
F-Statistic	19.607	0.000
Serial Correlation	0.972	0.386
Heteroscedasticity	0.615	0.839
Linearity Test	1.458	0.151
Normality	1.719	0.423
	CUSUM	CUSUMSQ
Stability Test	Stable	Stable

Source: Researcher's Computation 2025

Table 4 reports the long-run estimates, short-run estimates, and the diagnostic tests for the relationship between interest rates and inflation rates. The dependent variable is the Inflation Rate (INF) and the regressors are the Prime Lending Rate (PLR), Monetary Policy Rate (MPR), Money and Supply Growth (MSG).

Interpretation

Bound Test

The bound test was used to ascertain the possibility of a long-run relationship with the results showing that the bound test statistics of 7.869 is statistically significant at a 5 percent significant level. The result implies the possibility that the variables have a long-

run cointegrating relationship. Therefore, based on the possibility of a long-run relationship between interest rates and inflation rate, the study estimates the long-run and the short-run elasticity. The empirical results for the model for the effects of interest rates and inflation rate, in the short and long runs, are reported in Table 4.

The Long-Run Dynamics

Panel A of Table 4 displays the ARDL models estimated long-run coefficients. Long-term data suggested that the prime lending rate and inflation rate have a negative connection, meaning that a rise in the prime lending rate would cause Nigeria's inflation rate to decline. In other words, the inflation rate would drop by 2.269 percent for every 1% increase in the prime lending rate. The findings additionally demonstrated a substantial correlation between the prime lending rate and Nigerian inflation (PLR = -2.296, t-test = -3.057, $p < 0.05$). This suggests that the prime lending rate plays a major role in influencing variations in Nigeria's inflation rate.

The findings also indicated that there is a negative correlation between the inflation rate and the monetary policy rate, suggesting that raising the monetary policy rate would cause the inflation rate to decrease. As a result, a one percent increase in inflation will result in a 1.553 percent drop. The results also showed a substantial correlation between the monetary policy rate and Nigeria's inflation rate (MPR = -1.553, t-test = -2.009, $p < 0.05$), suggesting that the monetary policy rate is a major factor influencing fluctuations in Nigeria's inflation rate.

The findings also demonstrated a positive correlation between the money supply and the inflation rate, i.e., an increase in the money supply will result in a rise in inflation. That example, a one percent increase in the money supply will result in an inflation rate increase of 0.456 percent. Additionally, the results showed that there is no significant correlation between the growth of the money supply and the rate of inflation in Nigeria (MSG = 0.456, t-test = 1.102, $p > 0.05$). This suggests that variations in the level of inflation in Nigeria are not significantly influenced by the expansion of the money supply.

Short-run Dynamics

This subsection serves a dual function. To determine the degree of adjustment back to equilibrium using the error correction term, the first step is to determine if changes and the statistical significance observed in the long run also exist in the short-run model. The error correction term (ECTt-1) measures the short-run adjustment process, which demonstrates how soon variables recover from a shock and reach balance. To ensure stability, the coefficient of ECTt-1 needs to be statistically significant and have a negative sign.

The outcome of the regression analysis demonstrated that there is a brief and negligible correlation between the prime lending rate and the rate of inflation. This outcome is consistent with the long-term negative link, suggesting that the relationship between the prime lending rate and Nigeria's inflation rate is both a short- and longterm

phenomenon. Furthermore, data indicates a positive and substantial short-term link between the inflation rate and the monetary policy rate. The varying outcomes over the long and short terms indicate that raising the policy rate by the monetary policy authority will worsen inflation in the short term but have a negative long-term effect on the rate of inflation. Additionally, the results showed that, but not significantly, the money supply and institutional quality had a favorable short-term association with the inflation rate.

The cointegrating term is found to have the correct sign and is significant as predicted, according to the short-run results, suggesting that any deviation from the steady state in Nigeria can be readily adjusted for. Consequently, Panel B of 4 reports an estimated coefficient for the ECTt-1 that is negative and statistically significant (ECT= 0.177, t-test = -5.058 $p < 0.05$). It can be inferred that during the next quarter, deviations from the inflation rate equilibrium path are adjusted by almost eighteen percent. Stated differently, Nigeria has a comparatively modest process of adjustment. Interest rates and inflation rates in Nigeria have a long-run equilibrium relationship, which is further supported by the statistical significance of the ECTt-1.

With an adjusted R-square of 0.480, it can be inferred that only approximately 48% of the variations in the inflation rate can be explained by the prime lending rate, monetary policy rate and money supply growth; the remaining 52% can be attributed to other factors that influence inflation rate fluctuations but are not included in the model. The F-test, which verifies the null hypothesis that every coefficient in the model is zero, indicates the overall fit of the model. The model fits the data well in this instance, as shown by the F-test's significance at the 5% level. Alternatively, the prime lending rate, monetary policy rate, and money supply growth are all major factors influencing changes in Nigeria's inflation rate, according to the F-test statistic of 19.607 with a probability value of 0.000. As a result, the alternative hypothesis which holds that interest rates significantly affect inflation in Nigeria was accepted and the null hypothesis which holds that interest rates have no substantial influence on inflation was rejected.

Post-Estimation Test

Five distinct kinds of diagnostic tests were conducted to ensure the reliability and validity of the parameter estimates and to enable the drawing of appropriate conclusions from the data. The Fstatistic of 0.972 and a probability value of 39% are greater than the 5 percent level, indicating that the successive error terms are not serially associated, according to the data. Therefore, the results do not rule out the null hypothesis that the residuals show no serial connection. According to the study's findings, there was no correlation between the subsequent error terms in the estimated model for Nigeria's inflation and interest rates. This infers that the homoscedasticity null hypothesis could not be rejected, the heteroscedasticity results demonstrated that the F-statistic of 0.615 with a probability value of 84 percent is not statistically significant at the 5 percent level of significance. There is proof, therefore, that the error terms' variance is homoscedastic.

Moreover, the statistical significance of the Ramsey RESET test for linearity is not established; its F-statistic is 1.458, and its probability value is 15 percent, higher than the 5 per level. The findings thus show that there is a linear relationship between interest rates and the rate of inflation in Nigeria and that the estimated model is appropriately stated. Similar to this, the normality test Jarque-Bera statistic yielded an F-statistic of 1.719 with a probability statistic of 42%, which is higher than the significance level of 5%. As a result, the null hypothesis of normalcy was accepted. Panel C presents the results of the CUSUM and CUSUMSQ statistics.

Discussion of Empirical Findings

The objective of this paper was achieved through the application of the Autoregressive Distributed Lag (ARDL) model, which revealed the existence of a long-term cointegrating relationship between interest rates and the inflation rate in Nigeria over the study period. The results, based on both long-run and short-run elasticities, provide key insights into the nature of this relationship.

In the long run, the findings indicate that both the prime lending rate and the monetary policy rate have a negative relationship with the inflation rate, while money supply growth exhibits a positive relationship with inflation in Nigeria. Moreover, the prime lending rate and the monetary policy rate were found to have statistically significant long-run effects on the inflation rate, whereas money supply growth did not demonstrate a significant long-run impact. Consequently, the hypothesis test results supported the rejection of the null hypothesis that interest rates have no significant effect on inflation, and led to the acceptance of the alternative hypothesis that interest rates significantly affect inflation in Nigeria.

These findings align with those of several prior empirical studies. For instance, Musa (2021) examined the interrelationship between interest rates and inflation in Nigeria from 2000 to 2019 and found that, although interest rates were weak instruments for controlling inflation in the short run, they became more effective and relevant in the long run. Similarly, Lindiwe et al. (2023) found that monetary policy had no significant impact on inflation control in Nigeria in both the short and long run. Mirza and Rashidi (2020), in their study on South Asian Association for Regional Cooperation (SAARC) economies using panel data from 2006 to 2018, examined two scenarios: (i) the causal relationship between lending rates and changes in the inflation rate, and (ii) the relationship between real interest rates and inflation. While the first scenario showed no significant relationship, the second scenario revealed a substantial causal link between real interest rates and inflation.

Furthermore, the findings of this paper are consistent with those of Von Wyngard et al. (2024), who investigated the influence of money supply, interest rate, exchange rate, and oil prices on inflation in South Africa. Their study found that approximately 97% of movements in the consumer price index (CPI) could be explained by these four macroeconomic variables. Notably, money supply and exchange rates had a strong

positive relationship with inflation, while interest rates and oil prices exhibited a significant negative relationship. The authors concluded that these variables should be actively managed within a macroeconomic policy framework to control inflation effectively.

Conclusion and Recommendations

This paper examined the impact of the interest rate transmission channel on inflation in Nigeria. The empirical analysis revealed mixed results. In the long run, there is evidence that both the prime lending rate and the monetary policy rate have a negative relationship with the inflation rate, while money supply growth exhibits a positive relationship. Additionally, both the prime lending rate and the monetary policy rate have a statistically significant long-run effect on inflation, whereas money supply growth does not show a significant long-run influence.

In the short run, the monetary policy rate and money supply growth display a positive relationship with inflation, while the prime lending rate shows a negative relationship. However, only the monetary policy rate was found to have a statistically significant short-run impact on inflation. The results of the hypothesis testing support the rejection of the null hypothesis that interest rates have no significant effect on inflation in Nigeria and the acceptance of the alternative hypothesis that interest rates significantly influence inflation.

The findings suggest that interest rates are important determinants of inflation in Nigeria, though the direction and magnitude of their effects differ. While the prime lending rate consistently exerts the expected negative impact on inflation in both the short and long run, the monetary policy rate only demonstrates a negative effect in the long term. Furthermore, the combined effect of interest rates and money supply growth explains only 48% of the variation in inflation, indicating that 52% of inflationary pressures stem from factors beyond the scope of monetary policy. This paper concludes that while interest rates are significant in influencing inflation in Nigeria, their effectiveness is largely observed in the long run. The expected inverse relationship between interest rates and inflation is only partially evident, particularly with the monetary policy rate showing a counterintuitive positive relationship in the short run despite being a key short-term policy tool.

Based on these findings, the paper recommends that:

I. In addressing inflationary pressures, the Central Bank of Nigeria (CBN) should not rely solely on interest rate adjustments through the monetary policy rate. Instead, it should also implement measures aimed at controlling the growth of money supply in the economy. Moreover, given that a substantial portion of inflation is driven by factors beyond monetary policy,

ii. The paper advocates for stronger collaboration between monetary and fiscal authorities. This includes joint efforts with relevant ministries, departments, and agencies to eliminate structural and institutional impediments to effective inflation control in Nigeria.

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Appendix

Table 5: Data Presentation

YEAR	INFL (%)	PLR (%)	MPR (%)	M2 (N'Billion)
1999	6.6	17.00	18.00	699.73
2000	6.9	12.00	14.00	1,036.08
2001	18.9	12.95	20.50	1,315.87
2002	12.9	18.88	16.50	1599.49
2003	14	15.02	15.00	1985.19
2004	15	14.21	15.00	2,263.59
2005	17.9	7.00	13.00	2,814.85
2006	8.5	8.80	10.00	4,027.90
2007	6.6	6.91	9.50	5,857.76
2008	15.1	4.50	9.75	9,315.11
2009	12.1	6.13	6.00	10,918.67
2010	13.8	10.25	6.25	11,662.91
2011	10.3	16.75	12.00	13,179.00
2012	12	17.20	12.00	15,391.22
2013	8	13.34	12.00	17,307.37
2014	8	15.99	13.00	18,654.27
2015	9.5	16.28	11.00	19,599.13
2016	18.55	18.50	14.00	23,173.26
2017	16.5	18.98	14.00	23,944.66
2018	12.1	14.55	14.00	26,455.41
2019	11.4	15.00	13.50	28,877.94
2020	15.75	16.18	13.50	37,828.88
2021	15.63	17.00	11.50	44,443.07
2022	21.34	17.08	16.50	51,8011.38
2023	28.20	18.5	18.75	52,195.14

Source: Central Bank of Nigeria Bulletin and Statement of Account 2023.