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MONETARY POLICY INSTRUMENTS AND INFLATION IN NIGERIA (2000–2025)

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ABSTRACT

This study examined the effect of monetary policy instruments on inflation in Nigeria from 2000 to 2025. Specifically, it investigated the effects of broad money supply, open market operations and the monetary policy rate on inflation. Annual time-series data were analysed using the Autoregressive Distributed Lag (ARDL) technique in EViews 10. Unit root and ARDL bounds tests were conducted to assess stationarity and the existence of a long-run relationship. The bounds test indicated a long-run relationship at the 5% significance level (F = 4.157). Broad money supply had a negative but insignificant coefficient (β = −0.2168, p = 0.4807), and open market operations also had a negative but insignificant coefficient (β = −0.0701, p = 0.1404). The monetary policy rate, however, had a positive and significant coefficient (β = 0.7260, p = 0.0061). The error-correction coefficient was negative and significant (−0.6500, p = 0.0001), indicating an annual adjustment rate of approximately 65%. The model explained 50.16% of the variation in changes in inflation. The study concludes that, among the instruments examined, only the monetary policy rate showed a statistically significant relationship with inflation, and that the positive sign is consistent with policy reaction to inflation rather than a causal effect. It recommends effective liquidity management, improved policy coordination and careful assessment of monetary policy rate adjustments to promote price stability.

Key words: *Broad money supply, inflation, monetary policy, monetary policy rate, open market operations.*

Paper type: *Research paper* ***JEL Classification:*** *E52, E58, C22*

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INTRODUCTION

Monetary policy refers to the measures used by the monetary authority to regulate the supply and cost of money, while also influencing important macroeconomic variables in the economy. In practice, these measures are aimed largely at maintaining price stability and supporting economic stability, although achieving both can sometimes be challenging (Ezeanyeji, Obi, Imoagwu & Ejefobihi, 2021). Usually, these dynamic economic variables are grouped as short-term macroeconomic factors and include instruments like demand and supply of money, interest/discount rates, volume of credits, and size of deposit money institutions' reserves. These instruments are so volatile that their regulation/management has direct implications on the price stability goals of macroeconomic authorities. Of course, it is worth noting that price generally covers the values that goods and services as well as foreign exchanges are traded. Although little emphasis is paid to deflation, most concerns of regulatory authorities have been on inflation, over time (Offor, Amadi & Ibeaja, 2022).

Over the years, the CBN has executed monetary tightening measures to combat inflation; nonetheless, these initiatives often coincided with a decline in investment and output growth, raising concerns about the related trade-offs (Akinbobola, 2012). Conversely, expansionary policies have occasionally boosted liquidity without corresponding improvements in productivity within the real sector. To achieve economic stability, central banks employ macroeconomic strategies referred to as monetary policy (MP) to regulate currency supply, interest rates, and access to credit (International Monetary Fund, 2005, 2023). The CBN utilizes several monetary policy instruments to manage inflation and ensure price stability, such as the monetary policy rate (MPR), exchange rate strategies, control over money supply, adjustments in lending rates, and pricing systems for imported goods. Monetary policy remains central to economic management in numerous developing countries, especially in Nigeria, where economic circumstances can frequently change abruptly and unpredictably. In practical terms, monetary policy denotes the actions taken by the Central Bank of Nigeria to manage the money supply, affect lending practices, and ensure a stable economic atmosphere. For years now, Nigeria has battled with rising inflation, unstable exchange rates, weak purchasing power, and uneven economic growth. The divergent views as expressed by scholars underscore the need for a comprehensive causality and impact analysis that spans different monetary regimes and structural shifts within the Nigerian economy (Udemezue, Nneli, Unachukwu, Oko & Uwakwe, 2026). These challenges have affected nearly every part

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of the economy: businesses struggle with production costs, households face declining living standards, and government spending keeps stretching under pressure. As noted by Adegboyo, Keji, and Fasina (2021), monetary policy remains a critical instrument for stabilizing economic activities and steering growth in Nigeria, even though the economy itself is exposed to several structural weaknesses. In Nigeria, the government has historically relied on monetary policy to achieve specific macroeconomic objectives, such as job creation, economic growth and development, the balance of payment stability, and a reasonably steady general price level (Goshit, Jelilov, Iorember & Celik, 2020).

The role of monetary policy on the economic growth and its effect on price stability depends on how monetary policy is conducted and the independence of the central bank to choose the appropriate monetary tools to formulate the monetary policy of macroeconomic objectives (Alavinasab, 2016). According to Central Bank of Nigeria (2021) monetary policy is an arrangement or a purposeful measure which is designed to regulate the value, supply and cost of money in an economy in consonance with the expected level of economic activity. However, monetary authority via central bank uses various monetary policy instruments which include; monetary policy rate, money supply, lending interest rate, cash reserve ratio, discount rate, open market operation among other instrument in targeting at controlling volume of money in circulation either directly or indirectly (CBN, 2016). Monetary policy influences the volume and direction of purchasing power in an economy and is an instrument of market intervention to achieve rationality stipulated objectives which otherwise be impossible of attainment at least in terms of volume, speed and direction (Anyanwu, as cited in Arema & Omoniyi, 2021). In order to maintain price stability and a healthy balance of payments position, monetary management depended on the use of direct monetary instruments such as credit ceilings, selective credit controls, administered interest and exchange rates, as well as the prescription of cash reserve requirements and special deposits (Amadi, Ewubare & Georgewill, 2025).

Although previous studies have examined monetary policy and inflation in Nigeria, some important gaps remain. Amadi et al. (2025) and Ovat et al. (2022) focused primarily on economic growth, while Okatahi et al. (2025) and Olise and Ejedegba (2025) examined inflation using the Vector Error Correction Model and Vector Autoregression approaches, respectively. Onuh and Asom (2024) concentrated on the effects of changes in the monetary policy rate on aggregate demand, output, and inflation. Consequently, the reviewed studies

differ in their analytical focus, estimation techniques, and combinations of monetary policy variables, leaving room for further evidence on the joint relationship between broad money supply, open market operations, monetary policy rate, and inflation within a single framework. This study addresses this gap by examining these three monetary policy instruments jointly using annual Nigerian data from 2000 to 2025 and the Autoregressive Distributed Lag (ARDL) technique. It contributes updated evidence on their individual relationships with inflation and the existence of short-run and long-run relationships, thereby providing a basis for assessing the effectiveness of monetary policy instruments in promoting price stability in Nigeria.

Objectives of the study

The main objective of this study is to examine the effect of monetary policy on inflation in Nigeria. The specific objectives are to:

(i) investigate the effect of broad money supply on the inflation rate in Nigeria;

(ii) examine the effect of open market operations on the inflation rate in Nigeria; and

(iii) assess the effect of the monetary policy rate on the inflation rate in Nigeria.

Research hypotheses

H_{01}: Broad money supply has no significant effect on the inflation rate in Nigeria.

H_{02}: Open market operations have no significant effect on the inflation rate in Nigeria.

H_{03}: The monetary policy rate has no significant effect on the inflation rate in Nigeria.

LITERATURE REVIEW

Monetary policy

Monetary policy denotes the measures taken by the Central Bank of Nigeria to control the money supply, which may involve various discretionary monetary policy tools like open market operations (OMO), discount rates, reserve requirements, direct supervision of bank credit, and direct interest rate regulation (Effiong et al., 2022). In Nigeria, the CBN has relied on monetary targeting as a key approach for managing inflation over the years. Its approach includes modifying several monetary instruments, including the monetary policy rate (MPR), to control the expansion of the money supply and mitigate inflationary pressures. Nonetheless, in spite of the financial measures, the CBN seems to be struggling to control the escalating price levels in Nigeria as inflation increases. In the last ten years, Nigeria has

experienced a significant increase in price levels. The yearly average inflation rate escalated from a single-digit 8.0 percent in 2014 to 24.7 percent in 2023. By October 2024, the monthly inflation rate hit 33.7 percent, with the food component seeing an even greater inflation rate, surpassing 40.5 percent in October 2024. Core inflation, which excludes farm products and energy, climbed to 26.2 percent (Nigerian Economic Summit Group [NESG], 2024).

The MPR in Nigeria was introduced in 2006 to replace the minimum rediscount rate (MRR). There are two types of monetary policy situations, namely, expansionary and contractionary monetary policy (CBN, 2021). Expansionary monetary policy helps in supplying money to the economy by reducing interest rates when there is less liquidity. Hence, it is used during recessions. Contractionary monetary policy helps reduce excess liquidity and inflation in the economy by increasing interest rates so that the money supply will become limited and, automatically, inflation will decrease (Nikhil & Deene, 2021).

Broad money supply

Money supply refers to the total sum of funds that can be obtained within an economy at any moment, encompassing cash, demand savings, along with various liquid assets. It exists typically assessed using financial aggregates like M1 (narrow money) and M2 (expanded money supply). Broad Money Supply refers to the total volume of money moving within an economy, including physical cash, bank deposits, savings, and other assets that can easily be converted into money. It is commonly represented as M2 and is one of the major indicators used by monetary authorities to monitor liquidity and general economic activities (Bello, Audu, Hamman, Ali, Usman, Ejila, Ubiakwoyibo, Okeke & Kalu, 2022). In Nigeria, the Central Bank of Nigeria pays close attention to broad money supply because changes in the amount of money circulating through the economy often affect prices, spending patterns, investment decisions, and production levels. When money supply rises too quickly without enough goods and services to match it, inflationary pressure usually begins to build slowly at first, then sometimes all at once. Ogbonnaya, Maduka and Okafor (2025) explained that broad money supply plays an important role in shaping economic activities and maintaining price stability, particularly in developing economies. They noted that uncontrolled expansion in money supply may weaken purchasing power and increase inflation if not properly managed. In a similar view, Bello et al. (2022) argued that fluctuations in money supply directly influence lending behaviour, aggregate demand, and investment activities within the Nigerian economy. Still, the relationship is rarely ever perfectly balanced. There are periods

when an increase in money supply stimulates growth and business expansion, and then there are moments when the same increase creates pressure on exchange rates and consumer prices.

Open market operations

Open Market Operation (OMO) is basically the way the Central Bank of Nigeria buys or sells government securities to control how much money is moving around in the economy. It is used to manage liquidity, steady interest rates, and keep inflation in check. When securities are sold, money is pulled out of circulation, but when they are bought back, liquidity returns into the system. Adelowokan, Adesoye, and Ogunmuyiwa (2019) noted that OMO is quite important for maintaining price stability and controlling excess money supply in Nigeria. In a similar way, Leo and Abubakar (2023) explained that it helps regulate liquidity and reduce inflation pressure, though its effect is not always immediate or evenly felt across sectors, sometimes it works fast, other times it feels delayed. In Nigeria, OMO has become a common tool especially during periods of inflation pressure and exchange rate instability. Through treasury bills and similar instruments, the Central Bank of Nigeria tries to absorb excess cash and stabilize financial conditions, even if the environment is not always cooperative. Adegboyo, Keji, and Fasina (2021) observed that monetary policy tools like OMO influence macroeconomic stability and growth, though structural issues often weaken their full impact. Likewise, Shaibu and Enofe (2021) argued that OMO affects lending patterns, investment decisions, and overall economic performance. Still, the outcomes are not always straightforward, sometimes it helps stabilize things, and other times it quietly slows down borrowing and business activity in ways that are hard to immediately notice.

Inflation

This indicates the percentage rise in the financial worth of goods and services over a specified period, typically calculated annually. It is often measured by the indices of the Consumer Price Index (CPI) or the Producer Price Index (PPI) (Galí, 2015). Inflation diminishes purchasing power, hampers savings, and can have an adverse impact on economic growth if left unchecked (Darius et al., 2026). Central banks aim for low and stable inflation through monetary policy measures, such as adjustments in interest rates and liquidity management. The inflation rate is essentially the consistent increase in prices over time while money continuously depreciates in value. In Nigeria, it profoundly impacts everyday life, influencing food, transportation, and savings. Inflation reflects weaknesses in macroeconomic management and can worsen income inequality by reducing the purchasing power of

households. It is commonly measured using the Consumer Price Index (CPI), which tracks changes in the prices of goods and services over time. Bello, Uwawunkonye, and Adaeze (2024) believed that it is significantly influenced by monetary policy, whereas Akpan & Udo (2023) emphasized that structural and import factors diminish control. Nonetheless, inflation fluctuates inconsistently, increasing and decreasing in a somewhat erratic manner.

Review of previous empirical studies

Amadi, Ewubare and Georgewill (2025) examined how monetary policy affected economic growth in Nigeria between 1982 and 2022 using time-series data obtained from the World Development Indicators and the CBN Statistical Bulletin. The research primarily examined the effects of interest rate, exchange rate, money supply, and cash reserve ratio on Nigeria's gross domestic product. For analyzing the data, the researchers utilized descriptive statistics, unit root tests, bounds cointegration, ARDL estimation, and various diagnostic assessments. Their results indicated that the variables were integrated at various levels, although a long-term relationship still persisted among them. The findings indicated that the money supply positively and significantly influenced GDP, suggesting that rises in money supply generally encouraged economic growth. Conversely, the cash reserve ratio, exchange rate, and interest rate exhibited adverse effects on GDP, indicating that rises in these factors diminished growth performance. The study determined that monetary policy significantly influences the economic growth of Nigeria based on these results.

Okatahi, Busari, Ajayi and Chidiebere (2025) investigated the impact of monetary policy on inflation in Nigeria during the timeframe from 2000 to 2024. The research focused on how monetary policy tools like interest rates, cash reserve ratio (CRR), and money supply impacted inflation trends in the economy. Leveraging secondary data sourced from the Central Bank of Nigeria and pertinent organizations, the researchers utilized econometric methods such as unit root tests, co-integration analysis, and the Vector Error Correction Model (VECM) to identify both short-term and long-term relationships among the variables. The results indicated that monetary policy significantly impacts inflation in Nigeria over the long term, with the error correction mechanism revealing that fluctuations from the long-term equilibrium are adjusted gradually at a rate of approximately 40.3% per year. Notably, the money supply proved to be the most significant factor influencing inflation, sustaining causal links with price changes in both the short and long term. Interest rates and CRR, nonetheless, showed weaker links to inflation, especially over the long term. The Granger causality

findings showed a unidirectional link between money supply and inflation, and similarly between reserve ratio and interest rate.

Onuh and Asom (2024) investigated the impact of the monetary policy rate on the Nigerian economy by exploring the macroeconomic elements of total demand, overall production levels, and inflation. The study utilized quarterly data concerning Nigeria's economy from 2006Q4 to 2022Q4. The study simulated the impacts of a 5% increase and a 5% decrease in the monetary policy rate on aggregate demand, overall output, and inflation rates. The study indicated that increasing the monetary policy rate was not successful in controlling inflation in Nigeria. An increase in the monetary policy rate resulted in a higher interest rate, which in turn affected the accessibility of credit to the private sector. A reduction in credit access for the private sector adversely affects overall demand and total production volume in the economy. The study also reveals that reducing the monetary policy rate in the country is expected to increase the credit accessible to the private sector, which may enhance aggregate demand and total output production, thereby fostering GDP growth in the economy.

Furthermore, Ovat, Ishaku, Ugbaka and Ifere (2022) assessed the impact of the monetary policy rate (MPR) on Nigeria's economic growth through annual data from 2006 to 2020. The method used in this paper employs a simultaneous equation model that utilizes Two Stage Least Squares (2SLS). The variables of interest encompassed the Broad money supply concerning GDP (M2/GDP), Credit to the private sector in relation to GDP (CPS/GDP), Cash reserve ratio (CRR), Liquidity ratio (LQR), and Lending interest rate (LIR). The preliminary unit root test showed that the data is stationary after the first difference. The weak instrument test demonstrates a robust instrument at 10% and 20%. The remaining results indicate no signs of heteroskedasticity in the model. The findings indicated that the monetary policy rate has a significant negative impact on economic growth, the Real Exchange Rate (REXR) exhibits an inverse and significant correlation with economic growth, while inflation (INFL) affects economic growth in a negative but insignificant manner. Olise and Ejedegba (2025) examined the effects of monetary policy on inflation in Nigeria, using data covering the period 1986 to 2023. It employed the Vector Autoregression (VAR) model, using EViews 12 econometric software for the estimation. The results show that monetary policy rate (MPR) and money supply have positive effects on inflation whereas, interest rate and liquidity ratio exert negative effect on inflation in Nigeria with liquidity ratio being statistically significant. The study therefore, stresses the need for the monetary authority to take charge of the cash

movements by maintaining stable monetary policy rate that would stabilize interest rate and encourage borrowings from financial institutions in order to keep money supply at moderate state to discourage inflation.

Theoretical framework

Theory of money

The Theory of Money, as developed within the Keynesian framework by John Maynard Keynes (1936), explains the relationship between money supply, interest rates, investment, and economic activity. The central argument is that changes in the availability of money can influence interest rates and, through this channel, affect spending and the general price level. When money supply increases relative to money demand, interest rates may decline, making borrowing less expensive and encouraging investment. An increase in investment can stimulate aggregate demand and potentially raise inflationary pressures. Conversely, a reduction in money supply may increase interest rates, discourage investment, and moderate aggregate demand. The extent of these effects depends on how financial markets and economic activities respond to monetary changes (Mgbomene & Nnamocha, 2023).

This theory provides a basis for understanding how monetary policy may influence inflation in Nigeria. Broad money supply represents the volume of money available within the economy, while open market operations affect banking system liquidity through the purchase and sale of government securities. The monetary policy rate also influences the cost of borrowing and the willingness of households and businesses to spend and invest. Changes in these instruments may therefore affect aggregate demand and price movements. However, their actual effects on inflation may depend on prevailing economic conditions and the effectiveness of monetary policy transmission. The theory is consequently relevant to this study because it provides a framework for examining the relationship between broad money supply, open market operations, monetary policy rate, and inflation in Nigeria.

Monetarist theory of inflation

On closer examination of the money transmission mechanism, it can be seen that there are intermediary variables such as interest rates, income levels, output, and increased production costs, which contribute to rising prices. Nevertheless, the monetarist theory of inflation indicates a direct connection between the money supply and inflation. The monetarist school of thought, spearheaded by Milton Friedman, embodies a contemporary version of classical

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macroeconomics. They created a more nuanced and pertinent version of the quantity theory of money. Similar to any ideological framework, Friedman (1970) highlighted the importance of money supply as the crucial element influencing the health of the economy. This theory asserts that the money supply significantly affects inflation.

Consequently, this research is anchored in the Monetarist theory of inflation. This implies that as the money supply expands because of rising production and employment, it generates an inflationary environment in the economy. Monetarists hold that the money supply is the primary element influencing the health of the economy (Friedman, 1968). Monetarists argue that an expansion of the money supply will result in a rise in nominal demand, and in situations of excess capacity, they assert that production will be boosted. In the long run, the monetarist view is that a rise in money supply will lead to inflation without impacting investment, employment, and aggregate demand. This current study tests the validity of this direct relationship.

MATERIALS AND METHODS

This study adopted an ex post facto research design since the variables examined already exist and cannot be controlled or manipulated by the researchers. The study covers Nigeria from 2000 to 2025 (26 annual observations; 25 observations are used in estimation after one lag is lost), subject to the availability and consistency of the data. Data were obtained from secondary sources, mainly the Central Bank of Nigeria Statistical Bulletin and publications of the National Bureau of Statistics. The variables are the inflation rate (INF, the dependent variable), broad money supply (M2), open market operations (OMO) and the monetary policy rate (MPR). INF, M2 and MPR are measured in percentages (annual inflation rate, annual growth rate of broad money and the policy rate, respectively), and OMO is measured as the value of open market operations. All series were transformed into common (base-10) logarithms before estimation, so the coefficients are elasticities.

The study employed the Autoregressive Distributed Lag (ARDL) technique because of its flexibility when variables are integrated at mixed orders, I(0) and I(1). Before estimation, Augmented Dickey-Fuller (ADF) unit root tests were conducted to establish the stationarity properties of the variables and to avoid spurious regression. Breusch-Pagan-Godfrey heteroskedasticity and Breusch-Godfrey serial correlation tests were carried out to assess the

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reliability of the estimates. Data analysis was done using EViews 10.0, and all hypotheses were tested at the 5% level of significance.

Model specification

This study adopted and modified the econometric model used by Anisiobi, Okeke, Madueke and Ozoh (2025), who examined monetary policy and exchange rate dynamics in Nigeria. Their model was specified as:

$$REXR = f\ (MS, RGDP, INTR, INFR, CRPS) \quad (1)$$

where REXR is the real exchange rate, MS is money supply, RGDP is real gross domestic product, INTR is the interest rate, INFR is the inflation rate and CRPS is credit to the private sector. The model was adapted to examine how monetary policy relates to inflation in Nigeria. Broad money supply (M2), open market operations (OMO) and the monetary policy rate (MPR) were used as the monetary policy indicators, while the inflation rate (INF) was the dependent variable. The functional and econometric forms are:

$$INF_t = f\ (M2_t, OMO_t, MPR_t) \quad (2)$$

$$INF_t = \beta_0 + \beta_1 M2_t + \beta_2 OMO_t + \beta_3 MPR_t + \varepsilon_t \quad (3)$$

where β0 is the intercept, β1 to β3 are the long-run coefficients and εt is the error term. The general ARDL specification is:

$$INF_t = \alpha_0 + \Sigma\varphi_i INF_{t-i} + \Sigma\beta_j M2_{t-j} + \Sigma\gamma_k OMO_{t-k} + \Sigma\delta_l MPR_{t-l} + \varepsilon_t \quad (4)$$

where α0 is the constant, φi, βj, γk and δl are the coefficients of lagged inflation and of the explanatory variables and their lags, and the lag orders are selected by information criteria. The selected model is ARDL(1, 0, 0, 0), for which the conditional error-correction form used in the bounds test is:

$$\Delta INF_t = \alpha_0 + \rho INF_{t-1} + \theta_1 M2_t + \theta_2 OMO_t + \theta_3 MPR_t + \varepsilon_t \quad (5)$$

In equation (5), ρ is the speed-of-adjustment (error-correction) coefficient, which is expected to be negative and significant, and θ1 to θ3 are the coefficients on the levels of the explanatory variables in the conditional model. The implied long-run coefficient of each explanatory variable is obtained as $-\theta i/\rho$.

RESULTS AND DISCUSSION

This section presents the empirical results. All estimations were performed using EViews 10.0 and Microsoft Excel.

Descriptive statistics

Table 1: Descriptive statistics

Statistic	INF	M2	OMO	MPR
Mean	1.119785	1.298661	4.520902	1.120590
Median	1.115943	1.339561	3.964137	1.122139
Maximum	1.521683	1.545409	5.940306	1.440279
Minimum	0.731275	1.053098	2.673877	0.778151
Std. Dev.	0.177668	0.135353	1.000371	0.152952
Skewness	0.005628	-0.343185	0.237789	-0.053231
Kurtosis	2.989408	2.971646	2.718882	3.702336
Jarque-Bera	0.000259	1.207781	2.023057	0.546661
Probability	0.999871	0.546681	0.363663	0.760841
Sum	29.11442	33.76518	117.5435	29.13534
Sum Sq. Dev.	0.789150	0.458009	25.01857	0.584859
Observations	26	26	26	26

Source: Researchers' computation using EViews 10.0, 2026

Table 1 shows the descriptive statistics for the variables. The mean values of INF, M2, OMO and MPR were 1.1198, 1.2987, 4.5209 and 1.1206, respectively. INF and OMO are positively skewed (0.0056 and 0.2378), while M2 and MPR are negatively skewed (−0.3432 and −0.0532). The Jarque-Bera probabilities (0.9999, 0.5467, 0.3637 and 0.7608) all exceed 0.05, so the null hypothesis of normality is not rejected for any of the variables.

Unit root test

The unit root test is used to check whether the variables remain stable over time or their statistical properties change from one period to another. This is an important step in time-series analysis, as using non-stationary data without proper treatment can lead to misleading results. In this study, the test helps establish the stationarity level of each variable and determine whether the data are suitable for the subsequent econometric analysis.

Table 2: Augmented Dickey-Fuller unit root test results

Variable	Series tested	ADF statistic	5% critical value	Prob.	Order of integration
INF	Level	-4.404055	-2.998064	0.0023	I(0)
M2	First difference	-3.841909	-3.612199	0.0317	I(1)
OMO	Level	-4.836968	-2.991878	0.0008	I(0)
MPR	First difference	-5.542294	-3.612199	0.0008	I(1)

Source: Researchers' computation using EViews 10.0, 2026. Null hypothesis: the series has a unit root.

Table 2 shows that the null hypothesis of a unit root is rejected for all four series at the 5% level, since each probability value is below 0.05 and each ADF statistic is more negative than its critical value. INF and OMO are stationary at level, I(0), while M2 and MPR become stationary after first differencing, I(1). The variables therefore have mixed orders of integration and none is I(2), which makes the ARDL approach suitable.

Heteroskedasticity test

The heteroskedasticity test checks whether the error variance in the regression model remains constant across observations. This matters because when the variance changes, the standard errors and conclusions drawn from the regression may become unreliable. In this study, the test is carried out to check whether the estimated models meet the constant variance assumption and whether the results can be relied upon for further interpretation.

Table 3: Heteroskedasticity test: Breusch-Pagan-Godfrey

F-statistic	1.099342	Prob. F(4,20)	0.3841
Obs*R-squared	4.505986	Prob. Chi-Square(4)	0.3418
Scaled explained SS	1.111183	Prob. Chi-Square(4)	0.8925

Source: Researchers' computation using EViews 10.0, 2026

Table 3 shows that the probability values of the F-statistic (0.3841), Obs*R-squared (0.3418) and Scaled explained SS (0.8925) all exceed 0.05. The null hypothesis of homoskedasticity is therefore not rejected, so the model shows no significant heteroskedasticity.

Serial correlation test

The Breusch-Godfrey (BG) Serial Correlation test is used to determine whether the error terms in a regression model are related over time. This matters because such a connection, if present, may affect the reliability of the regression results and the conclusions drawn from them.

Table 4: Breusch-Godfrey serial correlation LM test

F-statistic	1.244348	Prob. F(2,18)	0.3118
Obs*R-squared	3.036670	Prob. Chi-Square(2)	0.2191

Source: Researchers' computation using EViews 10.0, 2026

Table 4 shows that the probability values of the F-statistic (0.3118) and Obs*R-squared (0.2191) both exceed 0.05. The null hypothesis of no serial correlation is not rejected, so the residuals show no evidence of serial correlation.

ARDL bounds test for cointegration

The bounds test examines whether a long-run (levels) relationship exists among variables that may be integrated of order zero or one. The result is presented in Table 5.

Table 5: ARDL bounds test result

Test statistic	Value	Significance	I(0)	I(1)
F-statistic	4.156719	10%	2.37	3.20
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Researchers' computation using EViews 10.0, 2026. Null hypothesis: no levels relationship. Case 2: restricted constant and no trend.

Table 5 shows an F-statistic of 4.156719, which exceeds the upper-bound critical value of 3.67 at the 5% level. The null hypothesis of no long-run relationship is therefore rejected, indicating a long-run relationship between inflation and the monetary policy variables.

Conditional error-correction regression and implied long-run coefficients

Table 6 reports the conditional error-correction regression of equation (5). The coefficients on M2, OMO and MPR are the levels terms of that regression (θ1 to θ3); they are not themselves long-run effects. The implied long-run coefficients, obtained as $-\theta/\rho$ with $\rho = -0.650031$, are reported in Table 7.

Table 6: ARDL conditional error-correction regression

Variable	Coefficient	Std. error	t-statistic	Prob.
C	0.526234	0.434427	1.211329	0.2399
INF(-1)*	-0.650031	0.180220	-3.606885	0.0018
M2**	-0.216796	0.301684	-0.718620	0.4807
OMO**	-0.070080	0.045655	-1.535016	0.1404
MPR**	0.726006	0.237086	3.062200	0.0061

Source: Researchers' computation using EViews 10.0, 2026. Dependent variable: D(INF); selected model: ARDL(1, 0, 0, 0); Case 2: restricted constant and no trend; sample 2000–2025; 25 included observations. * p-value incompatible with the t-bounds distribution. ** Variable interpreted as Z = Z(−1) + D(Z).

Table 6 shows that M2 has a negative but insignificant coefficient (−0.216796, p = 0.4807) and OMO also has a negative but insignificant coefficient (−0.070080, p = 0.1404). The MPR coefficient is positive and statistically significant (0.726006, p = 0.0061). The coefficient on lagged inflation is negative and significant (−0.650031, p = 0.0018), which is consistent with adjustment of inflation towards its long-run level. Among the three explanatory variables, only the monetary policy rate is statistically significant.

Table 7: Implied long-run coefficients

Variable	Conditional coefficient (θ)	Implied long-run coefficient (−θ/ρ)
C	0.526234	0.8096
M2	-0.216796	-0.3335
OMO	-0.070080	-0.1078
MPR	0.726006	1.1169

Source: Computed from Table 6 with ρ = −0.650031. Standard errors of the long-run coefficients were not reported by the software output; statements of significance rest on the t-tests in Table 6.

The implied long-run coefficient of MPR is 1.1169, meaning that, because the series are in logarithms, a 1% increase in the monetary policy rate is associated with an increase of about 1.12% in inflation in the long run. The implied coefficients of M2 (−0.3335) and OMO (−0.1078) are negative but, given the insignificant t-tests in Table 6, are not statistically distinguishable from zero.

Short-run estimates (error-correction model)

The error correction model (ECM) captures the short-run dynamics of the variables while accounting for their long-run equilibrium relationship. It incorporates differenced variables and the lagged error-correction term to show how short-run deviations from equilibrium are corrected over time.

Table 8: Short-run estimates (error-correction model)

Variable	Coefficient	Std. error	t-statistic	Prob.
CointEq(-1)*	-0.650031	0.130162	-4.994028	0.0001
R-squared	0.501627	Mean dependent var		0.020839
Adjusted R-squared	0.501627	S.D. dependent var		0.166732
S.E. of regression	0.117705	Akaike info criterion		-1.402085
Sum squared resid	0.332510	Schwarz criterion		-1.353330
Log likelihood	18.52606	Hannan-Quinn criter.		-1.388562
Durbin-Watson stat	1.532028			

Source: Researchers' computation using EViews 10.0, 2026. Dependent variable: D(INF); selected model: ARDL(1, 0, 0, 0); Case 2: restricted constant and no trend; sample 2000–2025; 25 included observations.

Table 8 shows an error-correction coefficient of −0.650031 (p = 0.0001), which is negative and significant. About 65% of the previous period's deviation from the long-run relationship is corrected within one year, assuming the long-run relationship is valid. The selected model has no differenced explanatory terms, so Table 8 does not provide separate short-run effects for M2, OMO and MPR. The R-squared value of 0.501627 indicates that the model explains about 50.16% of the variation in the change in inflation, while the remaining 49.84% is due to factors outside the model and random disturbances.

Discussion of findings

The ARDL bounds test revealed a long-run relationship between inflation and the monetary policy variables in Nigeria. The F-statistic of 4.156719 exceeded the 5% upper-bound critical value of 3.67, leading to the rejection of the null hypothesis of no long-run relationship. This suggests that broad money supply, open market operations and monetary policy rate are jointly associated with inflation over the study period.

Broad money supply had a negative but statistically insignificant coefficient (β = −0.216796, p = 0.4807). This indicates that its estimated relationship with inflation was not statistically significant at the 5% level. The result does not support the conventional expectation of the Quantity Theory of Money, which associates increases in money supply with higher prices when other relevant conditions remain unchanged. Nevertheless, the finding does not establish that money supply has no influence on inflation in Nigeria. Rather, it suggests that its estimated effect was not statistically distinguishable from zero in the selected model and sample period. This finding differs from Okatahi et al. (2025), who identified money supply as a significant determinant of inflation in Nigeria in both the short and long run. This difference may reflect variations in model specification and the period examined. Amadi et al. (2025) also found that money supply significantly influenced economic growth, although their study focused on GDP rather than inflation.

Similarly, open market operations recorded a negative and statistically insignificant coefficient (β = −0.070080, p = 0.1404). Although the negative sign suggests an inverse relationship with inflation, the result does not provide sufficient statistical evidence of a significant effect. This may indicate that the influence of open market operations on inflation is affected by other economic conditions not captured in the model. This outcome differs from the positive relationship between money supply and inflation reported by Olise and Ejedegba (2025), suggesting that the relationship may vary with model specification, period of analysis and prevailing economic conditions.

The monetary policy rate had a positive and statistically significant coefficient (β = 0.726006, p = 0.0061). This suggests that higher policy rates were associated with higher inflation in the reported regression. One possible explanation is that monetary authorities raise interest rates in response to existing inflationary pressures, while supply-side constraints and policy transmission lags may delay the expected reduction in inflation. However, this association does not establish that higher policy rates cause inflation to increase. This finding aligns with

Onuh and Asom (2024), who reported that increasing the monetary policy rate was unsuccessful in controlling inflation in Nigeria. It also suggests that higher policy rates may occur alongside persistent inflationary pressures.

Decisions on the hypotheses

On the basis of the t-tests in Table 6 at the 5% level, the null hypothesis H01 (broad money supply has no significant effect on inflation) is not rejected (p = 0.4807). The null hypothesis H02 (open market operations have no significant effect on inflation) is not rejected (p = 0.1404). The null hypothesis H03 (the monetary policy rate has no significant effect on inflation) is rejected (p = 0.0061), since the monetary policy rate has a positive and statistically significant relationship with inflation.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the effect of monetary policy instruments on inflation in Nigeria from 2000 to 2025 using the ARDL approach. The bounds test indicated a long-run relationship between inflation and the monetary policy variables (F = 4.157, above the 5% upper bound of 3.67), and the error-correction term (−0.650, p = 0.0001) indicated that about 65% of the deviation from the long-run relationship is corrected within one year. Among the three instruments, only the monetary policy rate had a statistically significant relationship with inflation, and that relationship was positive. Broad money supply and open market operations had negative but statistically insignificant relationships with inflation.

The study therefore concludes that, within the sample period, the monetary policy rate is the only instrument whose movements are significantly associated with inflation, while broad money supply and open market operations did not show a significant independent relationship. The positive sign on the monetary policy rate is consistent with policy rates being raised in response to rising inflation and should not be read as evidence that higher rates cause higher inflation. The effectiveness of monetary policy in Nigeria depends on the consistency of policy implementation, coordination with fiscal policy and a supportive economic environment.

Recommendations

Based on the empirical findings of the study, the following recommendations are made.

1. The Central Bank of Nigeria (CBN) should continue to monitor broad money supply while avoiding reliance on monetary expansion or contraction as the sole instrument for controlling inflation. Broad money supply had a negative but statistically insignificant relationship with inflation, so its independent effect was not established within the estimated model. The CBN should consider money supply alongside other macroeconomic and supply-side factors when designing inflation-control measures.
2. The CBN should review the transmission mechanism of open market operations to determine why their estimated relationship with inflation was statistically insignificant. The study found no statistically significant effect of open market operations on inflation. The CBN should assess whether the timing, scale and implementation of these operations adequately address liquidity conditions before making adjustments to the instrument.
3. The CBN should carefully evaluate the timing and broader economic implications of monetary policy rate adjustments, particularly during periods of rising inflation. The study found a positive and statistically significant relationship between the monetary policy rate and inflation. This does not establish that higher interest rates cause inflation, since policy rates may also be increased in response to existing inflationary pressures. The CBN should therefore consider prevailing inflation trends, exchange-rate movements and supply-side conditions when setting the policy rate.

Limitations and suggestions for further research

The results should be interpreted with caution. The sample is small (25 estimation observations) and uses annual data. The dependent variable (INF) is stationary at level, whereas the bounds test is designed for a dependent variable integrated of order one, so the long-run and error-correction results are better read as evidence of persistence and mean reversion in inflation than as strict cointegration. The model is a single equation without control variables such as the exchange rate, fiscal policy or supply-side shocks, and the policy rate may respond to inflation, so the estimated relationships are associations and not causal effects. Future studies could use higher-frequency data, include control variables and structural breaks, and apply approaches that treat the policy rate as endogenous.

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