EFFECTIVENESS OF MONETARY POLICY TOOLS IN CONTROLLING INFLATION IN NIGERIA (1981-2024)

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Abstract

The study evaluated the effectiveness of monetary policy tools in controlling inflation in Nigeria using time series data from 1981 to 2024. It examined the impact of the monetary policy rate on the exchange rate, its effect on inflation, and the causal relationship between money supply and inflation. Employing the Autoregressive Distributed Lag (ARDL) model and the Granger causality test, the unit root tests (ADF and PP) confirmed different degrees of integration, while the Bound Test validated long-run relationships. The Error Correction Model (ECM) indicated that inflation adjusts toward equilibrium at a rate of 37% per year, with past liquidity expansion contributing to current inflation. The findings revealed that money supply, monetary policy rate, liquidity ratio, and GDP significantly influence inflation, with money supply increasing inflation, while the monetary policy rate and GDP help reduce it in the long run. However, structural constraints limit the effectiveness of monetary policy, necessitating broader economic reforms. Based on the findings, the study recommends ensuring close collaboration between monetary and fiscal authorities to align policies and improve inflation control; managing liquidity through targeted monetary measures to prevent excessive money supply from fueling inflation; investing in key sectors and improving productivity to reduce supply-side constraints and stabilize prices; and maintaining transparency, consistent communication, and central bank independence to anchor inflation expectations and improve policy effectiveness.

Keywords: *Central Bank, Exchange Rate, Inflation, Liquidity Ratio, Monetary Policy*

Background to the Study

The Central Bank of Nigeria (CBN) holds primary responsibility for regulating the supply of money and overseeing its circulation, with monetary policy serving as a key instrument for achieving macroeconomic objectives, particularly price stability (Chaudhry et al., 2015). In a developing economy like Nigeria, managing the money supply while curbing inflation is a persistent challenge, as unchecked expansion of money often intensifies inflationary pressures, undermining economic stability and growth.

To mitigate these effects, the CBN employs a variety of monetary policy tools, including the monetary policy rate introduced in December 2006, which is designed to influence money market activities and strengthen the financial system (Fabian & Charles, 2014). These interventions reflect efforts to create a stable economic environment conducive to investment and growth.

Historically, Nigeria has experienced significant inflationary volatility. In the 1990s, inflation surged from 63.6% to 72.8%, followed by periods of double-digit inflation in the early 2000s, peaking at 17.9% in 2005 (Central Bank of Nigeria, 2010). A temporary stabilization occurred between 2006 and 2007, with inflation falling to 8.24% and 5.38%, respectively, but these gains were reversed in subsequent years as rates rose to 11.60% in 2008 and 12.00% in 2009. Between 2010 and 2015, inflation fluctuated between 9.1% and 11.8%, before spiking to 15.7% in 2016 (National Bureau of Statistics [NBS], 2016). More recently, inflation escalated from 16.95% in 2021 to 24.66% in 2023, reaching an all-time high of 34.8% in 2024 (NBS, 2024; CBN, 2024). These trends highlight the challenges faced in achieving sustainable price stability and underscore the critical role of effective monetary policy in controlling inflation.

The persistence of inflation has far-reaching socio-economic consequences, including erosion of purchasing power, distortion of relative prices, discouragement of savings and investments, and reduction in household real income, particularly for low- and middle-income earners (Philip et al., 2014). Structural and institutional factors, such as inadequate infrastructure, currency depreciation, fiscal indiscipline, over-reliance on oil revenue, and exposure to external shocks like global oil price fluctuations, have further complicated inflation management (Clement et al., 2021; Idoko et al., 2017). Despite reforms ranging from direct controls in earlier decades to market-based instruments such as the Monetary Policy Rate, Nigeria has struggled to maintain inflation within the single-digit target (Manu & Chindo, 2018). This persistent challenge underscores the necessity of critically examining the effectiveness of monetary policy tools in controlling inflation in Nigeria between 1981 and 2024, which forms the primary aim of this study.

Literature Review

Conceptual Review

Monetary Policy

Monetary policy is the central bank's action to regulate money supply and credit to achieve macroeconomic goals such as price stability, employment promotion, output growth, balance of payments equilibrium, and equitable income distribution (Chima et al., 2022; Babatunde & Kehinde, 2016). It is classified into contractionary policy, which reduces credit and aggregate demand to control inflation, and expansionary policy, which increases money supply to stimulate investment, consumption, and employment, though it may also trigger inflation (Jhinghan, 2010).

Exchange Rate

The exchange rate is the price of one currency in terms of another and affects international competitiveness and domestic price stability (Mordi, 2006). It can be expressed directly (home currency per unit of foreign currency) or indirectly (foreign currency per unit of home currency). Exchange rate regimes include fixed systems, where rates are set by the government or central bank and require substantial reserves, and floating systems, where market forces determine the rate with minimal intervention (CBN, 2021; Lawan & Abubakar, 2020).

Inflation

Inflation is a general and persistent rise in the overall price level, reducing the purchasing power of money (Chukwuemeka, 2018). It can be creeping, with a slow and steady increase over time, or hyperinflation, with rapid, extreme price rises that can destabilize the economy. High inflation redistributes income arbitrarily, erodes savings, distorts prices, and misallocates resources, making price stability a fundamental economic objective (Orubu, 1996).

Inflation Targeting

Inflation targeting is a monetary policy framework in which the central bank sets and publicly announces an inflation target, often using the Consumer Price Index (CPI) as a measure (Okotori & Gbalam, 2017). Policy adjustments are made depending on the gap between forecasted and target inflation. Its effectiveness relies on central bank autonomy, reliable data, a developed financial market, and transparent communication. Inflation targeting anchors expectations and helps maintain price stability by guiding systematic monetary policy responses (Islam et al., 2017; CBN, 2021).

Theoretical Framework

This study is anchored on the Taylor (1993) Rule, which provides a systematic approach for adjusting short-term interest rates based on deviations in inflation and output from their target levels. The rule links the target interest rate to current inflation, the real balanced interest rate, the inflation gap, and the output gap, emphasizing both price stability and output stabilization. In the context of Nigeria, the Taylor Rule offers a framework to evaluate the effectiveness of monetary policy tools, such as the monetary policy rate, in controlling inflation between 1981 and 2024. While systematic interest rate adjustments can anchor inflation expectations and enhance predictability (Taylor, 1999), structural challenges including exchange rate volatility, supply shocks, underdeveloped financial markets, and a large informal sector may limit the direct impact of monetary tools, requiring adjustments to policy parameters (Fratzscher *et al.,* 2020). The effectiveness of this framework also depends on central bank credibility and independence, which are critical for implementing disciplined, long-term inflation-targeting policies free from political interference (Rogoff, 1985; Ahmed *et al.,* 2021).

Empirical Literature

The empirical literature review on monetary policy and inflation in Nigeria spans various methodologies and focal points, shedding light on the impact of monetary policy on inflation in the country.

The study by Hakimah (2025), Monetary and Fiscal Policy: Drivers of Stability in Developing Economies, the objectives of the study is to; examines the role of monetary and fiscal policies in achieving macroeconomic stability in developing countries. Using a qualitative research approach, the study relies on secondary data from peer-reviewed journals, international organizations, and government reports, employing thematic analysis to explore policy interactions. The findings highlight that monetary policy, through interest rate control and money supply management, plays a crucial role in controlling inflation but may stifle investment and economic growth if overly restrictive. Conversely, fiscal policy, through government spending and taxation, influences aggregate demand and growth but is often constrained by high public debt and inefficiencies in resource allocation. The study underscores the importance of policy coordination, emphasizing that misalignment such as an expansionary fiscal policy alongside a restrictive monetary policy can hinder economic stability. Key challenges identified for developing countries include inflationary pressures, external debt, weak institutions, and dependence on commodity exports, which exacerbate economic vulnerabilities. The study concludes that a balanced approach to monetary and fiscal policies, alongside structural reforms and strong governance, is essential for sustaining macroeconomic stability and long-term growth in developing economies.

Tonuchi et al. (2025) examine the feasibility and effectiveness of inflation targeting in Nigeria, employing the Autoregressive Distributed Lag (ARDL) model with data from 1981 to 2023 sourced from the Central Bank of Nigeria and the World Bank's World Development Indicators. The study finds that in the long run, the Monetary Policy Rate (MPR) significantly reduces inflation, aligning with monetary theory, while money supply is positively correlated with inflation, supporting the Quantity Theory of Money. Insecurity disrupts agricultural production and supply chains, contributing significantly to inflation, and greater Central Bank Independence (CBI) is associated with lower inflation, emphasizing the need for an autonomous central bank. Interestingly, Real GDP does not significantly affect inflation, highlighting the dominance of structural factors. In the short run, MPR has a stronger effect, with money supply and insecurity also playing key roles, and 89% of deviations from long-run equilibrium are corrected within a year. However, the study identifies challenges such as fiscal dominance, exchange rate volatility, and institutional weaknesses that hinder the effectiveness of inflation targeting. The authors conclude that while inflation targeting could be beneficial, its success in Nigeria depends on addressing these challenges, including strengthening central bank independence, improving monetary-fiscal coordination, enhancing transparency, and reducing reliance on oil revenues to stabilize exchange rates.

Ighorojea et al. (2025) examined the impact of the economic policy mix on monetary credibility in Nigeria using the Autoregressive Distributed Lag (ARDL) methodology over a 35-year period (1988–2022). Their findings revealed that government expenditure, tax revenue, and trade openness significantly enhance monetary credibility, while a lower monetary policy rate (MPR) also improves credibility. However, broad money supply (BMOS) was found to have no significant effect. The study concluded that fiscal discipline, efficient tax revenue collection, and trade openness are crucial for maintaining monetary policy credibility. These findings align with Osakwe et al. (2019) and Egbulonu and Ukwuoma (2018) but differ from Mlachila (2018) and Ogugua (2021), who found mixed effects of monetary policies on economic

credibility. The study emphasizes the need for Nigeria to implement effective fiscal and trade policies to enhance monetary stability and economic confidence.

Olaoye et al. (2024) examined the impact of fiscal policy on inflation in 44 sub-Saharan African (SSA) countries from 2003 to 2020, analyzing whether recent inflationary pressures in the region are driven more by fiscal imbalances than by monetary factors. Using non-linear system Generalized Method of Moments (system GMM) and dynamic panel threshold estimation, the study identified a public debt threshold of 60.59% of GDP, beyond which inflation worsens. The findings revealed that positive fiscal shocks (rising debt) significantly increase inflation**,** whereas negative fiscal shocks (debt reduction) have an insignificant impact, suggesting that reducing debt alone does not immediately curb inflation. Additionally, money supply had a positive but statistically insignificant effect on inflation**,** challenging the Quantity Theory of Money**,** while the joint effect of public debt and money supply was inflationary, indicating that public debt amplifies inflationary pressures. Corruption was also found to be a major determinant of inflation, highlighting the role of weak governance in undermining price stability. The study further recommended that SSA governments should limit public debt accumulation to 60.59% of GDP, strengthen fiscal discipline, and maintain inflation at a single-digit level of 4% to ensure macroeconomic stability. It concluded that monetary policy alone is insufficient in curbing inflation**,** emphasizing the need for coordinated monetary-fiscal policies, improved debt management, and governance reforms to stabilize inflation and sustain economic growth in SSA.

Ozili (2024) examined the adoption of an inflation-targeting monetary policy framework in Nigeria**,** which replaced the previous monetary targeting system in late 2023, analyzing the key success factors necessary for its effectiveness. Using a qualitative research approach and extensive literature analysis**,** the study identified critical determinants such as central bank credibility, independence, budget deficit reduction, financial development, and macroeconomic stability as essential for ensuring the success of inflation targeting in Nigeria. The findings revealed that public confidence in the Central Bank of Nigeria (CBN), effective communication, and avoiding fiscal dominance are fundamental to achieving inflation stability. However, the study also highlighted challenges such as high public debt, exchange rate volatility, and security concerns**,** particularly farmer-herder clashes and terrorism, which contribute to food price inflation and complicate inflation control. The study recommended strengthening central bank independence, improving policy coordination, reducing budget deficits, and enhancing financial inclusion to enhance the effectiveness of the new monetary policy framework. It concluded that while inflation targeting has the potential to improve monetary policy outcomes in Nigeria, its success will depend on institutional strength, policy credibility, and macroeconomic stability to ensure sustained price stability and economic growth**.**

Oyegun and Joshua (2024) examined the effectiveness of monetary policy in controlling inflation in Nigeria from 1980 to 2022, analyzing the impact of key monetary instruments such as the monetary policy rate (MPR), money supply (MS), exchange rate (EXC), and Treasury bill rate (TBR)**.** Using Augmented Dickey-Fuller (ADF) tests, Johansen's co-integration test, and the Error Correction Model (ECM)**,** the study found that monetary policy had no significant effect on inflation control in both the short and long run**.** Specifically, money supply and exchange rate had negative but insignificant effects on inflation**,** while the Treasury bill rate was the only variable with a significant impact in the short run but became

insignificant in the long run**.** The ECM coefficient (-0.6805) indicated that deviations from the long-run inflation rate were corrected at a 68% speed of adjustment, yet the model's low explanatory power (R^2 = 38.8%) suggested that inflation in Nigeria is influenced by factors beyond monetary policy alone. The study concluded that monetary policy alone is insufficient for inflation control and recommended a coordinated approach with fiscal policies, improved exchange rate management, enhanced liquidity control, and broader macroeconomic reforms to achieve price stability in Nigeria.

Iriabije et al. (2024) investigated the threshold effects of monetary policy on inflation in Nigeria from 1980 to 2021, analyzing the effectiveness of monetary policy rate (MPR) and money supply (MS) in stabilizing inflation. Using Threshold Autoregression (TAR)**,** the study identified 13.69% as the optimal MPR threshold and 11.19% for MS growth, beyond which monetary policy effectiveness varies. Findings revealed that in low policy rate regimes, both MPR and MS effectively curbed inflation, while exchange rate management had no significant impact. Conversely, in high policy rate regimes, MPR and MS remained effective, but exchange rate management became inflationary**,** suggesting that exchange rate interventions may destabilize inflation in high-inflation periods. The study further showed that excessive money supply growth significantly contributes to inflation**,** supporting the Quantity Theory of Money, while GDP growth reduces inflationary pressures. Policy recommendations emphasize maintaining MPR below 13.69% and MS growth under 11.19%, strengthening monetary-fiscal policy coordination, and cautious exchange rate interventions to ensure price stability. The study concludes that monetary policy effectiveness in Nigeria depends on these threshold levels**,** necessitating empirical-based policy adjustments to achieve sustained inflation control.

Ozili (2024) examined the impact of Central Bank Digital Currency (CBDC) issuance on economic growth and inflation in Nigeria, focusing on the effects of the non-interest-bearing eNaira CBDC introduced in October 2021. Using two-stage least squares (2SLS) regression and Granger causality tests, the study analyzed economic growth and inflation data from 2019 to 2022**,** sourced from the National Bureau of Statistics (NBS). The findings revealed that while CBDC issuance significantly boosted economic growth, particularly in the financial, agricultural, and manufacturing sectors, it also led to higher inflation**,** contradicting expectations that digital currency adoption would curb price increases. The non-oil sector's contribution to GDP increased, whereas the oil sector's share declined**,** highlighting the differential impact of CBDC adoption across industries. Additionally, cross-country comparisons with Malaysia, Brazil, and Argentina, which have not yet adopted a CBDC, indicated that Nigeria's growth trajectory was similar to those without digital currency implementation, suggesting that other macroeconomic factors may be at play. The study concluded that while CBDC stimulates economic growth**,** it does not effectively control inflation, emphasizing the need for better monetary policy coordination and potential modifications to CBDC design such as introducing interest-bearing features to enhance price stability while sustaining growth.

Methodology

Research Design

The ex-post facto research design is the most appropriate for this study as it examines the relationship between monetary policy tools and inflation using historical data. This design is non-experimental, meaning the researcher does not manipulate variables but instead analyzes existing data to determine patterns and causal relationships. It is particularly useful in economic research, where policy effects unfold over time and can only be studied retrospectively. By employing an ex-post facto approach, the study can effectively assess the impact of monetary policy tools on inflation without interference, making it a reliable choice for evaluating policy effectiveness in Nigeria.

Source of Data

The study examines the impact of monetary policy tools on controlling inflation in Nigeria from 1981 to 2024, focusing on variables such as inflation (INF) (proxied by the Consumer Price Index), exchange rate (EXR), money supply (M2), monetary policy rate (MPR), interest rate (INR), Gross Domestic Product (GDP), and liquidity Ratio (LQR), all sourced from the Central Bank of Nigeria's Statistical Bulletin (2024).

Model Specification

This study aims to examine the effectiveness of monetary policy tools in controlling inflation in Nigeria. The model was adapted from Fabian and Charles (2014) and is given as;

$$INFR = f(MS, INT, EXR) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (3.1)$$

The linear equation of this model can be written as:

$$INFR_t = \beta_0 + \beta_1 MS_t + \beta_2 INT_t + \beta_3 EXR_t + \mu_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (3.2)$$

However, this study adapts the model by adding other variables, supported by the Taylor Rule (1993). Thus, this study expresses inflation (INF), proxied by the consumer price index, as the dependent variable, while exchange rate (EXR), money supply (M2), monetary policy rate (MPR), interest rate (INR), and liquidity ratio (LQR), and Gross Domestic Product (GDP), serve as independent variables. The model in this study is as follows:

$$INF = f(EXR, M2, MPR, INR, LQR, GDP) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (3.3)$$

Transform equation (3.12) into econometric model

$$INF_t = \beta_0 + \beta_1 EXR_t + \beta_2 M2_t + \beta_3 MPR_t + \beta_4 INR_t + \beta_5 LQR_t + \beta_6 GDP_t + \mu_t \ldots \ldots \ldots (3.4)$$

Where; Inflation (INF), Exchange Rate (EXR), Money Supply (M2), Monetary Policy Rate (MPR), Interest Rate (INR), Liquidity Ratio (LQR), and Gross Domestic Product (GDP), β_0=Constant term, $\beta_1 - \beta_5$= parameter of the variables to be estimated, μ_t = error term.

Results and Presentation

Table 1: Descriptive Statistics

	INF	EXR	M2	MPR	INR	LQR	GDP
Mean	91.68333	130.8855	10120.86	19.59682	6.925150	37.14091	3.90E+13
Median	37.45211	114.8990	1387.643	13.10500	6.959583	39.40000	2.90E+13
Maximum	524.9054	899.8930	63512.40	72.84000	29.16000	69.10000	7.79E+13
Minimum	0.489349	0.617708	14.47117	5.390000	0.316667	5.800000	73755.08
Std. Dev.	123.0606	167.0699	15423.04	16.26938	4.326227	15.95246	2.22E+13
Skewness	1.816891	2.502967	1.691648	1.752750	2.902486	0.023639	0.433166
Kurtosis	5.870191	11.38108	5.249662	5.135620	17.11735	2.387230	1.722772
Jarque-Bera	39.31101	174.7201	30.26407	30.89057	427.1615	0.692490	4.366713
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.707339	0.112663
Sum	4034.067	5758.964	445317.9	862.2600	304.7066	1634.200	1.71E+15
Sum Sq. Dev.	651188.3	1200232.	1.02E+10	11381.78	804.7984	10942.69	2.12E+28
Observations	44	44	44	44	44	44	44

Source: *Author's Computation (2025)*

The descriptive analysis presented in Table 1 reveals significant variability and economic volatility in Nigeria from 1981 to 2024, reflecting the country's fluctuating economic conditions. Inflation (INF), with a mean of 91.68, shows a wide range from a minimum of 0.49 to a maximum of 524.91, highlighting periods of extreme inflationary pressures due to factors such as exchange rate fluctuations, government policies, and global economic shocks. Similarly, the Exchange Rate (EXR) demonstrates considerable volatility, with a mean of 130.89 and a range from 0.62 to 899.89, reflecting Nigeria's exchange rate crises, particularly linked to oil price fluctuations and political instability. Money Supply (M2) shows a mean of 10,120.86, with a range from 14.47 to 63,512.40, indicating significant interventions by the Central Bank of Nigeria to address inflationary pressures and economic crises. The Monetary Policy Rate (MPR), with a mean of 19.60, ranges from 5.39 to 72.84, signalling drastic adjustments to interest rates, particularly during periods of high inflation. Interest Rate (INR) shows a mean of 6.93, with a wide range from 0.32 to 29.16, reflecting varying borrowing costs over time, influenced by Nigeria's economic cycles. The Liquidity Ratio (LQR), with a mean of 37.14, ranges from 5.80 to 69.10, suggesting relative stability in Nigeria's banking sector with occasional regulatory adjustments. Finally, Gross Domestic Product (GDP), with a mean of 39 trillion fluctuates from 73.76 billion to 77.90 trillion, reflecting Nigeria's growth trajectory, influenced by oil price changes, global economic shifts, and internal policy decisions. The substantial minimum and maximum values across these variables underscore the challenges Nigeria has faced with economic instability, highlighting the need for effective policy management to mitigate volatility and promote sustainable growth.

Table 2: Correlation Matrix Results

	LINF	LEXR	LM2	MPR	INR	LQR	LGDP
LINF	1.000000						
LEXR	0.939458	1.000000					
LM2	0.972487	0.945774	1.000000				
MPR	-0.331543	-0.302772	-0.379977	1.000000			
INR	0.449266	0.236590	0.281851	0.024205	1.000000		
LQR	-0.304550	-0.346442	-0.325959	0.058416	-0.120492	1.000000	
LGDP	0.137661	0.385899	0.298314	-0.141867	-0.721946	-0.099685	1.000000

Source: *Author's Computation (2025)*

The results of the correlation matrix concerning the variables used in this study are presented in Table 2. The result indicates that the relationships between inflation (LINF), exchange rate (LEXR), money supply (LM2), monetary policy rate (MPR), interest rate (INR), liquidity ratio (LQR), and gross domestic product (GDP). A strong positive correlation exists between inflation and the exchange rate (0.94), suggesting that depreciation of the exchange rate likely drives up inflation, as higher import costs push prices upward. Inflation also exhibits a very strong positive relationship with money supply (0.97), indicating that an increase in money supply is closely linked to inflation, in line with the Quantity Theory of Money. A moderate negative correlation between inflation and monetary policy rate (-0.33) implies that higher interest rates may have a moderate effect on controlling inflation, though the relationship is not very strong. The correlation between inflation and interest rates (0.45) is moderate, suggesting that higher interest rates could somewhat contribute to inflation, despite their role in controlling demand-driven inflation. Inflation shows a slight negative relationship with the liquidity ratio (-0.30), indicating that higher reserves in banks may help reduce inflationary pressures. The relationship between inflation and GDP is weakly positive (0.14), implying that inflation may have a minimal effect on overall economic activity. The exchange rate shows a strong positive relationship with money supply (0.95), suggesting that fluctuations in the exchange rate are closely tied to liquidity changes in the economy. While exchange rate and monetary policy rate have a weak negative correlation (-0.30), the exchange rate and interest rate show a mild positive relationship (0.24), indicating that higher interest rates could have some effect on exchange rate movements. Exchange rate fluctuations also exhibit a moderate positive relationship with GDP (0.39), suggesting that a stable exchange rate could support economic growth. Money supply's correlation with monetary policy rate (-0.38) suggests that changes in money supply are somewhat linked to the direction of interest rates, while its relationship with GDP (0.30) points to a moderate positive effect, indicating that an increase in money supply could stimulate economic activity. Interest rates (INR) and liquidity ratio (LQR) show a slight negative relationship (-0.12), while interest rates have a strong negative correlation with GDP (-0.72), indicating that higher interest rates could significantly dampen economic growth by discouraging investment. Lastly, the liquidity ratio and GDP exhibit a minimal negative correlation (-0.10), implying that changes in liquidity ratios have a limited impact on GDP growth.

Table 3: Unit Root Test

	ADF TEST			PP TEST		
Variables	**At level**	**1st Diff.**	**Status**	**At level**	**1st Diff.**	**Status**
LINF	5.7052	4.0596	NA	-3.4877	-6.3052	I(0)
	(1.0000)	(1.0000)		(0.0535)*	(0.0000)***	
LEXR	3.9644	-14.7994	I(1)	-6.5213	-13.8610	I(0)
	(1.0000)	(0.0000)***		(0.0000)***	(0.0000)***	
LM2	1.8310	1.8347	NA	-3.2862	-8.0933	I(0)
	(0.9996)	(0.9996)		(0.0822)*	(0.0000)***	
MPR	-3.0511	-6.5825	I(0)	-2.8756	-7.9580	I(0)
	(0.0381)**	(0.0000)***		(0.1802)	(0.0000)***	
INR	-1.1062	-3.1818	I(1)	-2.4867	-1.9449	NA
	(0.7049)	(0.0282)**		(0.3328)	(0.3093)	
LQR	-2.5502	-6.9141	I(1)	-2.6211	-7.3511	I(1)
	(0.1112)	(0.0000)***		(0.2734)	(0.0000)***	
GDP	-4.4629	-0.8254	I(0)	-0.8492	-0.8254	NA
	(0.0011)***	(0.8014)		(0.9525)	(0.8014)	

Note: *** and ** indicate significance at 5% and 10% levels; Prob = probability; Diff = difference; NA = not applicable

Source: *Author's computation (2025)*

A unit root test was conducted to examine the time series properties and stationarity status of the variables used in this study, ensuring the avoidance of spurious regression results. Prior to estimating the Bounds test approach to cointegration, the study applied the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests, as proposed by Dickey and Fuller (1979) and Phillips and Perron (1988), respectively. The results, presented in Table 3, reveal a combination of I(0) and I(1) variables, making the Autoregressive Distributed Lag (ARDL) model the most suitable estimation technique. Specifically, the ADF test indicates that some variables, such as the Monetary Policy Rate (MPR) and Gross Domestic Product (GDP), are stationary at level I(0), whereas others, including the Exchange Rate (LEXR) and Liquidity Ratio (LQR), become stationary only after first differencing, indicating I(1) properties. Similarly, the PP test confirms this mixed stationarity pattern, with variables such as Money Supply (LM2) and Inflation (LINF) achieving stationarity at I(0), while others, such as Liquidity Ratio (LQR) and Exchange Rate (LEXR), require differencing to attain stationarity. Given this mixture of integration orders, the ARDL bounds testing approach is appropriate, as it accommodates both I(0) and I(1) variables, ensuring reliable short-run and long-run estimations.

Table 4: Bound F-Test Cointegration

Test Statistics	**Value**	**K**
F-Statistic	9.587204	6
	Critical Value Bounds	
Significance	**1(0) Bound**	**1(1) Bound**
10%	1.99	2.94
5%	2.27	3.28
1%	2.88	3.99

Source: *Author computation (2025)*

As shown in Table 4, the results of the bound test for cointegration assess whether a long-term equilibrium relationship exists between the variables being analyzed. The calculated F-statistic is 9.587204, which is compared against the critical value bounds at various significance levels (10%, 5%, and 1%). Since the F-statistic (9.587204) exceeds the upper critical value bound at all significance levels, this provides strong evidence of cointegration between inflation (INF) proxied by consumer price index, exchange rate (EXR), money supply (M2), interest rate (INR), liquidity ratio (LQD), and gross domestic product (GDP). This implies that a long-term equilibrium relationship exists between the analyzed variables.

Table 5: Short run ARDL estimation Results (3, 0, 1, 3, 0, 3, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LEXR)	-0.009866	0.014289	-0.690437	0.4954
D(LM2)	0.052432	0.040098	1.307593	0.2013
D(LM2(-1))	0.144442	0.040426	3.572999	0.0013***
D(LM2(-2))	0.074377	0.037337	1.992066	0.0559*
D(MPR)	0.165685	0.009674	17.127681	0.0000***
D(INR)	0.008235	0.009826	0.838074	0.4088
D(LQR)	0.030287	0.012428	2.437090	0.0212**
D(LGDP)	0.131556	0.012539	10.492022	0.0000***
CointEq(-1)	-0.036515	0.001556	23.461527	0.0000***
R^2=0.999983		F-statistics=81673.44		DW=2.237366
Adjusted R^2=0.999971		Prob.0.000000		

Source: *Author computation (2025)*

As depict in Table 5, the positive and statistically significant coefficients of money supply, monetary policy rate, liquidity ratio, and GDP on inflation in Nigeria can be explained through various economic mechanisms, primarily demand-pull and cost-push inflation. The significant lag effects of money supply LM2(-1) and LM2(-2) suggest that previous expansions in liquidity contribute to current inflationary pressures. This aligns with the quantity theory of money, where excessive liquidity relative to output leads to price increases (Fisher, 1911; Osakwe et al., 2019). The error correction term, ECM (-1) -0.036515, is negative and statistically significant at the 1% level, indicating a slow speed of adjustment to long-run equilibrium following short-term shocks. This means that only 37% of the disequilibrium in inflation is corrected within a given period, reinforcing the persistence of inflationary pressures in Nigeria.

The seemingly counterintuitive positive relationship between the monetary policy rate (MPR) and inflation may be attributed to the cost-push effect, where higher borrowing costs increase production expenses, thereby raising price levels (Olaoye et al., 2024). Similarly, the liquidity ratio (LQR) positively influences inflation, suggesting that higher liquidity in the banking sector facilitates increased lending, boosting aggregate demand and driving up prices. The strong positive association between GDP and inflation underscores demand-pull inflation dynamics, where rising economic activity and higher incomes lead to increased consumption and, consequently, higher prices (Adler et al., 2021).

The robustness of the model is confirmed by the high R^2 (0.999983) and adjusted R^2 (0.999971), indicating that nearly all variations in inflation are explained by the independent variables. The F-statistic (81673.44) and its probability (0.000000) confirm the overall significance of the model. The Durbin-Watson statistic (2.237366) suggests no severe autocorrelation issues, validating the reliability of the results. However, contrasting findings by Kromtit (2019) suggest that structural factors and supply-side constraints may also play a significant role in Nigeria's inflationary process. These results highlight the complex nature of inflation in Nigeria, necessitating a comprehensive approach that considers both monetary dynamics and broader structural and policy-related elements.

Table 6: Long run ARDL estimation Results (3, 0, 1, 3, 0, 3, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEXR	0.547845	0.352682	1.553367	0.1312
LM2	1.126480	0.420104	2.681434	0.0120**
MPR	-4.659756	2.703017	-1.723910	0.0954*
INR	0.287756	0.304203	0.945935	0.3520
LQR	-0.873338	0.658946	-1.325356	0.1954
LGDP	-3.703888	2.125911	-1.742259	0.0921*
C	120.517409	70.496071	1.709562	0.0980*

Source: *Author computation (2025)*

The long-run ARDL estimation results in Table 6 reveal that money supply (M2) has a positive and statistically significant effect on inflation, indicating that a 1% increase in M2 leads to a 1.13% rise in inflation. This aligns with the quantity theory of money, which posits that excessive liquidity relative to output contributes to inflationary pressures (Friedman, 1968; Osakwe et al., 2019). In contrast, the monetary policy rate (MPR) negatively impacts inflation, suggesting that a higher interest rate reduces inflation by approximately 4.7% in the long run. Similarly, GDP negatively influences inflation, with a 1% increase in GDP lowering inflation by 3.7%. This finding contrasts with the short-run results, where GDP had a positive effect on inflation, indicating that while economic growth may initially drive demand-pull inflation, long-term expansion is associated with supply-side improvements that stabilize prices.

The negative impact of MPR on inflation in the long run can be attributed to the contractionary monetary policy mechanism. Higher interest rates reduce borrowing, slow credit expansion, and decrease aggregate demand, ultimately lowering inflation (Mishkin, 2007; Olaoye et al., 2024). This supports Nigeria's inflation-targeting framework, where the central bank raises interest rates to curb excessive liquidity and speculative investment. However, contrary studies, such as Kromtit (2019) and Eze & Okonkwo (2020), argue that inflation in Nigeria is primarily driven by structural factors, such as exchange rate volatility and supply-side constraints, which limit the effectiveness of monetary policy alone. In this context, the Central Bank of Nigeria's inflation-targeting approach faces challenges due to fiscal dominance, weak transmission mechanisms, and external shocks, making price stabilization more complex.

The negative relationship between GDP and inflation suggests that long-term economic growth in Nigeria is driven by productivity gains rather than excessive demand. Unlike the short-run results, where rising

GDP increased consumption and contributed to inflation, the long-run effects indicate that sustained growth leads to better infrastructure, improved production capacity, and a more stable supply chain, ultimately reducing inflationary pressures (Adler et al., 2021). These findings emphasize the importance of structural reforms, investment in critical sectors, and supply-side policies in maintaining long-term price stability. While monetary policy plays a key role in inflation control, its effectiveness depends on complementary fiscal policies and structural adjustments to address cost-push factors and external vulnerabilities in Nigeria's economy.

Table 7: Post-estimated Diagnostic Test of ARDL Results

Test	Coefficient/Jargu-Bera	P-Value
Serial Correlation LM Test	0.367446	0.6969
Ramsey Reset Test	0.613214	0.5445
Residual Heteroskedasticity Test	0.998728	0.4920
Jargu-Bera Residual Normality Test	1.137411	0.566258

Source: *Author Computation (2025)*

The post-estimation diagnostic tests present in Table 7, confirm the reliability of the ARDL model by assessing serial correlation, model specification, heteroskedasticity, and residual normality. The Serial Correlation LM Test yields a p-value of 0.6969**,** indicating no autocorrelation in the residuals, ensuring the model adequately captures the dynamic relationships among variables. The Ramsey RESET Test**,** with a p-value of 0.5445**,** suggests that the model is correctly specified without functional form misspecification. The Residual Heteroskedasticity Test returns a p-value of 0.4920**,** confirming homoskedasticity and ensuring that the variance of residuals remains constant, making the estimated coefficients efficient and unbiased. Lastly, the Jarque-Bera Residual Normality Test, with a p-value of 0.5663**,** indicates that the residuals follow a normal distribution, validating the statistical inference of the model. Since all diagnostic tests confirm the absence of specification errors, serial correlation, and heteroskedasticity, the ARDL model is statistically robust and well-specified for policy analysis and forecasting in the Nigerian economic context.

Conclusion and Recommendations

The study reveals that monetary policy tools have a mixed impact on inflation in Nigeria. In the short run, money supply (M2), monetary policy rate (MPR), liquidity ratio (LQR), and GDP significantly drive inflation, reflecting both demand-pull and cost-push dynamics. The positive short-run effect of MPR suggests that higher borrowing costs may initially raise production expenses and prices, while past expansions in money supply contribute to current inflationary pressures. Conversely, in the long run, the monetary policy rate and GDP negatively influence inflation, indicating that sustained economic growth and contractionary monetary policies can stabilize prices over time. Money supply, however, remains inflationary in both periods, supporting the Quantity Theory of Money. The diagnostic tests confirm that the ARDL model is robust, well-specified, and free from serial correlation, heteroskedasticity, and functional misspecification. Overall, the results suggest that while monetary policy tools are crucial for controlling inflation, their effectiveness is conditioned by complementary fiscal measures, structural

reforms, and broader economic factors, emphasizing the need for a coordinated policy framework to achieve long-term price stability in Nigeria. Based on the conclusion the following recommendations were made;

i. Ensure close collaboration between monetary and fiscal authorities to align policies and improve inflation control.
ii. Manage liquidity through targeted monetary measures to prevent excessive money supply from fueling inflation.
iii. Invest in key sectors and improve productivity to reduce supply-side constraints and stabilize prices.
iv. Maintain transparency, consistent communication, and central bank independence to anchor inflation expectations and improve policy effectiveness.

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