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EVALUATING THE EFFECTIVENESS OF MONETARY POLICY INSTRUMENTS IN CONTROLLING INFLATION IN NIGERIA

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Abstract

This study evaluates the effectiveness of monetary policy instruments in controlling inflation in Nigeria using annual time series data from 2000 to 2025. Employing the Autoregressive Distributed Lag (ARDL) model and Error Correction Mechanism (ECM), the research investigates both the short-run and long-run relationships between inflation and core monetary policy instruments: Open Market Operations (OMO), Monetary Policy Rate (MPR), and Liquidity Ratio (LRR). Augmented Dickey-Fuller (ADF) unit root tests confirm that all variables are stationary at first difference, justifying the ARDL framework. The ARDL long-run estimates reveal that LRR have statistically significant impacts on inflation, LRR negatively affects inflation, indicating its effectiveness as a contractionary tool. OMO, and MPR, although theoretically important, are found to be statistically insignificant in the long run. The study recommends that the Central Bank of Nigeria (CBN) prioritize liquidity management through adjustments to the liquidity ratio and maintain cautious expansion of the money supply to mitigate inflationary pressures. Additionally, enhancing transparency and credibility in monetary policy operations, improving the effectiveness of OMO.

Keyword: *Inflation, Open Market Operations, Monetary Policy Rate, and Liquidity Ratio.*

JEL Classification: G21, 016, 033, C25

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Introduction

Monetary policy plays a crucial role in managing inflation in Nigeria, influencing key macroeconomic factors such as output, employment, and prices. The Central Bank of Nigeria (CBN) is central to this effort, and its success in controlling inflation hinges on its ability to effectively use various monetary policy tools. Over the years, the CBN has adapted its strategies to maintain economic stability (Sanusi 2002). Monetary policy refers to the actions taken by a central bank, such as the Central Bank of Nigeria (CBN), to manage the supply of money and interest rates in an economy to achieve macroeconomic goals like controlling inflation, unemployment, and ensuring economic stability. The two main types of monetary policy are contractionary and expansionary monetary policies (Central Bank of Nigeria, 2020).

Contractionary monetary policy is designed to reduce the money supply in an economy, typically to curb inflation and prevent an overheating economy. The central bank achieves this by increasing interest rates or selling government securities. Higher interest rates make borrowing more expensive, reducing consumer spending and business investment. By making money more expensive and less available, it decreases inflationary pressures (Ogunleye, 2008). This type of policy is typically used when an economy is growing too quickly, and inflation is rising. For example, in the early 1980s, the U.S. Federal Reserve implemented contractionary monetary policies by sharply raising interest rates to control the hyperinflation of the 1970s. Similarly, Nigeria has used contractionary policies, such as increasing the monetary policy rate (MPR), to combat rising inflation in recent years (Mordi & Adebiyi, 2010). Expansionary monetary policy is used to increase the money supply and lower interest rates, with the aim of stimulating economic growth, particularly during periods of recession or economic slowdown. Lower interest rates make borrowing cheaper, encouraging businesses to invest and consumers to spend, which in turn increases demand and boosts economic activity (Uchendu, 2009).

The primary goal of monetary policy in Nigeria has been to maintain domestic price stability and a stable exchange rate, as these are crucial for achieving sustainable economic growth and ensuring external sector viability. The policy aims to meet several macroeconomic objectives, including generating employment, stabilizing prices, balancing payments, boosting domestic production, reducing poverty, and controlling inflation.

However, the effectiveness of monetary policy in Nigeria has been hampered by several challenges. These include fiscal dominance, political interference, and a legal environment that constrains the Central Bank's operations. Before 1986,

monetary policy relied heavily on regulating bank activities, including fixed loans and interest rates. After the collapse of oil prices in the 1980s and the resulting balance of payments deficits, various stabilization methods were attempted, including both fiscal and monetary measures. Despite efforts, interest rates remained fixed, and deregulation measures were introduced in response to economic pressures.

In recent years, persistent exchange rate depreciations have paradoxically increased the attractiveness of investing in tradable goods, but this has not translated into sustainable economic growth. Nigeria continues to grapple with institutional and market failures that contribute to widespread poverty. Inflation remains relatively high, and institutional and market failures continue to hinder economic progress (Folawew & Osinubi, 2016).

These ongoing macroeconomic challenges indicate that inflation issues in Nigeria have not been effectively addressed by current monetary policies. This raises critical questions about the real impact of monetary policy measures on the Nigerian economy. Therefore, this study aims to reassess the impact of monetary policy on inflation in Nigeria with the following objectives What impact does open market operations have on inflation in Nigeria? How has the monetary policy rate impact inflation in Nigeria? What has been the impact of the cash reserve ratio on inflation in Nigeria? How has liquidity reserve ratio impact inflation in Nigeria?

2.1 CONCEPTUAL REVIEW

2.1.1 Concept of Monetary Policy

Monetary policy refers to the actions undertaken by a central bank to regulate the money supply and interest rates in an economy. The primary objectives are to control inflation, manage employment levels, and stabilize the currency. By adjusting monetary policy, central banks seek to influence economic conditions, including growth, employment, and inflation (Mishkin, 2015).

Monetary policy involves central bank actions designed to ensure economic stability. It acts as a corrective measure in response to economic challenges. For instance, if inflation is high, reducing the money supply can decrease purchasing power, lower demand, and ultimately reduce prices. Tools used in monetary policy include adjusting interest rates, changing reserve requirements, and conducting open market operations. The goals are to achieve full employment, stimulate GDP growth, stabilize prices and wages, and maintain a balanced payment equilibrium. Key instruments

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include open market operations (OMO), interest rates, money supply adjustments, foreign exchange rates, and reserve ratios (Onoh, 2007; Oyedibe, 2002; Taylor, 2004).

Monetary policy can be either expansionary or contractionary. During periods of economic slowdown and rising unemployment, expansionary measures might be used to boost demand. Conversely, if the economy is overheating and inflation is becoming a concern, contractionary measures may be implemented to reduce demand and control inflation (CBN, 2011).

Central banks use several tools to implement monetary policy: Open Market Operations (OMO): This involves buying or selling government securities in the open market to influence the amount of money in the banking system. By buying securities, a central bank injects money into the economy, aiming to lower interest rates and stimulate economic activity. Conversely, selling securities withdraws money from the economy, potentially raising interest rates and cooling off inflation (Blinder, 1998). Interest Rates: The central bank sets short-term interest rates, which influence borrowing and lending behaviors. The most well-known rate is the policy or discount rate, which affects the cost of borrowing for commercial banks. Lowering the policy rate generally encourages borrowing and investment, while raising it can help cool an overheating economy (Bernanke & Blinder, 1992). Reserve Requirements: This tool involves setting the minimum reserves that banks must hold against deposits. A lower reserve requirement increases the amount of money banks can lend, thus stimulating economic activity. On the other hand, a higher reserve requirement restricts lending and slows economic activity (Cecchetti, 2008). Cash Reserve Ratio (CRR):

This is the proportion of a bank's deposits that must be held in reserve and not lent out. Changes in the CRR can directly influence the liquidity available in the banking system (Gertler & Karadi, 2011).

2.1.2 Concept of Inflation

Inflation is the sustained increase in the general price level of goods and services in an economy over a period of time. When inflation occurs, each unit of currency buys fewer goods and services, meaning there is a decline in the purchasing power of money. Inflation can be measured using price indices such as the Consumer Price Index (CPI) and the Producer Price Index (PPI), both of which track changes in the cost of a basket of goods and services over time. While moderate inflation is often considered a sign of a growing economy, high or hyperinflation can lead to economic instability (Mishkin, 2019).

Mishkin (2019) describes inflation as a key indicator of the overall economic health of a country, noting that "inflation reflects the rate at which the cost of living is rising and can signal imbalances in the supply and demand for goods and services". Central banks, such as the Federal Reserve in the United States or the Central Bank of Nigeria, monitor inflation closely and adjust monetary policies accordingly to maintain price stability.

Inflation is typically measured by changes in the prices of goods and services over time. The most common indicators of inflation include the Consumer Price Index (CPI), which measures the average change in prices paid by consumers for a basket of goods and services, and the Producer Price Index (PPI), which tracks the changes in prices that producers receive for their goods.

Another important indicator is the GDP deflator, which reflects the overall price changes in an economy by comparing nominal GDP to real GDP. Additionally, core inflation measures inflation by excluding volatile food and energy prices, offering a clearer picture of underlying inflation trends (IMF, 2022).

2.2 Theoretical framework

2.2.1 Modern Monetary Theory (MMT)

This study adopts the Modern Monetary Theory (MMT) as its foundational theoretical framework to analyze the impact of monetary policy on inflation in Nigeria. MMT was primarily developed and popularized by economist Warren Mosler in the early 1990s and further advanced by scholars such as Stephanie Kelton, Bill Mitchell, and L. Randall Wray during the 2000s and 2010s.

The core premise of MMT is that countries that issue their own sovereign currency, such as Nigeria with the Naira, cannot default on debt denominated in their own currency, and thus have greater fiscal policy flexibility than traditionally perceived (Kelton, 2020; Wray, 2015).

According to MMT, the primary constraint on government spending is not the availability of money but real resource limitations and inflationary pressures that may arise when aggregate demand exceeds the economy's productive capacity (Tymoigne & Wray, 2014). Unlike mainstream economic models that emphasize controlling the money supply or interest rates to manage inflation, MMT advocates for active fiscal policy specifically government expenditure and taxation as the main tools for influencing macroeconomic stability. Fiscal policy, in this context, is crucial for modulating aggregate demand, promoting full employment, and preventing inflation from rising excessively

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(Kelton, 2020). The core premise of MMT can be summarized through the following key equations and concepts:

Government Budget Constraint (GBC): $G_t = T_t + \Delta B_t + \Delta M_t$ ----------3.1

Where:

G_t = government spending,

T_t = tax revenue,

ΔB_t = change in government debt,

ΔM_t = change in the monetary base (money issuance).

This equation illustrates that government expenditure is financed through taxation, borrowing (issuing bonds), or money creation. Since sovereign currency issuers like Nigeria can create money at will, they are not financially constrained in the same way as currency users, challenging the traditional view that deficits are inherently problematic.

In the Nigerian context, where inflation has often been driven by supply-side constraints, exchange rate volatility, and fiscal deficits, MMT offers a different perspective. It suggests that Nigeria, as a sovereign issuer of its currency, can utilize fiscal measures more actively to stimulate economic growth without necessarily risking runaway inflation, provided that resource utilization and capacity are monitored. This approach emphasizes managing inflation through real resource constraints and targeted taxation rather than solely relying on monetary policy instruments such as interest rate adjustments or money supply controls (Wray, 2015).

Therefore, within this framework, effective inflation control in Nigeria requires a coordinated policy approach where the Central Bank and government work together to utilize fiscal tools alongside monetary policy. This strategy involves stimulating productive capacity and managing aggregate demand to ensure inflation remains within desirable levels. Empirically, this framework guides the investigation of how fiscal and monetary policy variables influence inflation, considering Nigeria's unique economic structure and resource-dependent economy.

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2.3 Empirical Review

Ojo, A. A., & Oladipo, O. (2024) conducted a comprehensive study on the transmission of monetary policy to inflation and economic growth in Nigeria from 2001 to 2022. Using a Structural Vector Autoregression (SVAR) framework, they incorporated variables such as broad money, exchange rate, inflation rate, and GDP. Their results showed that monetary policy impacts inflation primarily through exchange rate channels, with depreciation fueling inflationary pressures, and through money supply. The study emphasized the importance of exchange rate stabilization alongside monetary policy adjustments. It recommended that Nigeria should strengthen its monetary policy framework by integrating exchange rate management and inflation targeting to achieve sustainable macroeconomic stability.

Adegbie, O. F., & Akinbami, F. (2023) examined the effect of monetary policy on inflation in Nigeria from 2000 to 2021 using quarterly data. Their study employed the Autoregressive Distributed Lag (ARDL) bounds testing approach to analyze both short- and long-term relationships among variables such as money supply, interest rates, inflation rate, and exchange rate. The findings indicated that an increase in money supply significantly elevates inflation in the long run, while interest rate changes have a dampening effect on inflation, albeit with some lag. The study concluded that prudent control of money supply and interest rate adjustments are crucial for stabilizing inflation. It recommended that Nigeria's monetary authorities adopt a cautious approach to money supply expansion and focus on macroeconomic stability measures to effectively manage inflationary pressures.

Enweremadu, E. C., & Ugwuoke, E. (2022) analyzed the impact of monetary policy instruments, including the Central Bank's policy rate and liquidity measures, on inflation in Nigeria from 2005 to 2021. Using a Vector Error Correction Model (VECM), their research identified a significant inverse relationship between the policy rate and inflation, suggesting that higher interest rates are effective in moderating inflationary trends. The study also found that liquidity injections tend to increase inflation, highlighting the importance of careful liquidity management.

Based on these findings, the authors recommended that Nigeria's central bank should prioritize interest rate policy adjustments and tighten liquidity controls during inflationary periods to ensure price stability. Bello, S. A., & Musa, A. (2022) investigated the relationship between monetary policy and inflation in Nigeria over the period 2000–2021 using the Dynamic Ordinary Least Squares (DOLS) methodology. Their analysis revealed that a tight monetary policy, reflected in higher

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interest rates and reduced money supply growth, significantly reduces inflation in the long run. The research also highlighted the importance of credible monetary policy and institutional independence in maintaining low and stable inflation. They recommended that Nigeria should enhance its monetary policy credibility by strengthening institutional frameworks and ensuring transparency in policy formulation to effectively combat inflation and promote economic stability.

Folawewo and Osinubi (2019) investigated the relationship between monetary policy and inflation in Nigeria using a threshold regression model with quarterly data from 2000 to 2019. The study analyzed the monetary policy rate (MPR) and broad money supply (M2) as independent variables, and the inflation rate as the dependent variable. The findings revealed a nonlinear relationship where monetary policy becomes more effective only after a certain inflation threshold is reached. This suggests that below that threshold, policy tools have limited influence. The authors recommended adopting a dual-targeting framework that combines inflation thresholds with broader macroeconomic indicators to guide timely and effective policy interventions.

3.1 METHODOLOGY

The study adopted ex-po facto research design, which was used to investigate the impact of Monetary policy on inflation in Nigeria. The study employed the Autoregressive Distributed Lag (ARDL) model approach to analyze data gotten from secondary annual time series, which was sourced from the Central Bank of Nigeria Statistical Bulletin, covering the extensive period from 2000 to 2025.

3.1.1 Model Specification

To analyze the impact of monetary policy on inflation in Nigeria. The model used in this study is adapted from the study of Folawewo and Osinubi (2019) who examined the impact of monetary policy on inflation control in Nigeria, in their study, they expressed inflation (INF) as a function of key monetary policy instruments such as the monetary policy rate (MPR), interest rates (IR), cash reserve ratio (CRR), and money supply (MS). The general form of their model is expressed as follows:

$$INF = f(MPR, IR, CRR, MS) \quad \text{----------(3.4)}$$

In this study, equation (3.4) is modified by removing the variables interest rates (IR) and introducing additional variables such as open market operations (OMO), liquidity Reserve ratio (LRR) and to better capture the current state of monetary policy operations in Nigeria. As a result, inflation rate

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(IFR) is now specified as a function of open market operations (OMO), monetary policy rate (MPR), cash reserve ratio (CRR), liquidity Reserve ratio (LDR) and Broad money supply (M2). The functional form of the modified model is expressed as:

IFR = f (OMO, MPR, CRR, LRR, M2) ---------- (3.5)

Where:

IFR = Inflation Rates

OMO = Open market operation

MPR = Monetary policy rate

CRR = Cash Reserve Ratio

LRR = Liquidity Reserve Ratio

M2 = Broad Money Supply

The explicit mathematical form of the model 3.4 is written as:

$IFR = \beta 0 + \beta 1OMOt\text{-}1 + \beta 2MPRt\text{-}2 + \beta 3CRRt\text{-}3 + \beta 4LRRt\text{-}4 + \beta 5M2t\text{-}5$ --------- (3.6)

The stochastic econometric form of model 3.5 is written thus:

$IFR = \beta 0 + \beta 1OMOt\text{-}1 + \beta 2MPRt\text{-}2 + \beta 3CRRt\text{-}3 + \beta 4LRRt\text{-}4 + \beta 5M2t\text{-}5 + Ut$ ------ (3.7)

Equation 3.6 is written in ARDL form as follows: $Ln(IFR) = \beta 0 + \beta 1\Sigma D(lnOMO)t\text{-}1 + \beta 2\Sigma D(lnMPR)t\text{-}2 + \beta 3\Sigma D(lnCRR)t\text{-}3 + \beta 4\Sigma D(lnLRR)t\text{-}4 + \beta 5\Sigma D(lnM2)t\text{-}5 + Ut$--------(3.8)

Where:

β0 = Constant intercept

β1 = Coefficient of Open market operation

β2 = Coefficient of Monetary policy rate

β3 = Coefficient of Cash Reserve ratio

β4 = Coefficient of Liquidity Reserve ratio

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$\beta 5$ = Coefficient of Broad money supply

Ui = Error term

The model apriori expectations is that is, $\beta 1 < 0$, $\beta 2 < 0$, $\beta 3 < 0$, $\beta 4 < 0$ and $\beta 5 > 0$. The a priori expectations of the model are derived from established economic theories regarding the relationship between monetary policy variables and inflation. These expectations are stated as follows:

$\beta_1 < 0$: An increase in Open Market Operations (OMO), which typically involves selling government securities to reduce money supply, is expected to decrease the inflation rate. This is because OMO as a contractionary monetary policy tool reduces the currency in circulation.

$\beta_2 < 0$: An increase in the Monetary Policy Rate (MPR) also signals a contractionary stance, as higher interest rates reduce borrowing, lower spending, and ultimately curb inflation.

$\beta_3 < 0$: An increase in the Cash Reserve Ratio (CRR) means commercial banks must keep more money with the Central Bank and have less to lend out to businesses and consumers. This reduces the money supply, slows down spending, and helps to lower inflation.

$\beta 4 < 0$: A higher Liquidity Reserve Ratio Reduces (LRR) the amount of liquid assets that banks can freely lend out. This should reduce the money circulating in the economy and thus reduce inflation.

$\beta_5 > 0$: An increase in Broad Money Supply (M2) means more money is available in the economy, which can drive up demand and lead to higher inflation. Therefore, the coefficient of broad money supply is expected to be positive.

4.1 Data Presentation and Analysis

The time series data collected for this study consist of values of Inflation Rate (INF), Open Market Operation (OMO), Monetary Policy Rate (MPR), Cash Reserve Ratio (CRR), Liquidity Reserve Ratio, and Broad Money Supply (M2), for the period 2000 -2025 are organized in a table marked as Appendix A. The data were sourced from Central Bank of Nigeria (CBN), IMF World Economic Outlook Report, World Bank Data and the National Bureau of Statistics (NBS) which was used for the analyses carried out.

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4.1.2 Descriptive Statistic

Table 4.1: Descriptive Statistics Result

Statistics	INF	LOG_OMO	MPR	LRR
Mean	14.20269	6.949898	13.98077	44.31808
Median	13.05000	6.979805	13.25000	43.32000
Maximum	33.20000	7.649693	27.75000	91.19500
Minimum	5.400000	6.214608	6.000000	29.50000
Std. Dev.	6.039612	0.457611	5.196597	15.37925
Skewness	1.277730	-0.158808	1.212370	1.160391
Kurtosis	5.066675	1.674091	4.711204	4.360060
Jarque-Bera	11.70165	2.013822	9.541543	7.838776
Probability	0.002878	0.365346	0.008474	0.019853
Sum	369.2700	180.6973	363.5000	1152.270
Sum Sq. Dev.	911.9227	5.235202	675.1154	5913.035
Observations	26	26	26	26

Source: Author's Computation Using E-view12, 2025

The descriptive statistics for the variables used in analyzing the impact of monetary policy on inflation in Nigeria provide valuable insights into the distribution, variability, and behavior of each variable over the study period.

The average inflation rate during the study period stands at 14.20%, with a median of 13.05%, suggesting that inflation was relatively high but moderately stable. The inflation rate peaked at

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33.20% and had a minimum of 5.40%, reflecting Nigeria's exposure to inflationary shocks and price instability. The standard deviation of 6.04 indicates notable variability in inflation, which could be influenced by fluctuating monetary conditions and policy shifts. The skewness value of 1.28 implies a positive skew, meaning more instances of lower inflation and fewer extreme high values. The kurtosis of 5.07 shows the presence of heavy tails or outliers, further confirmed by the Jarque-Bera probability of 0.0029, indicating the inflation data deviate significantly from a normal distribution.

The log-transformed Open Market Operation (OMO) variable has a mean of 6.95, with a closely aligned median of 6.98, suggesting a fairly symmetric distribution. The values range from 6.21 to 7.65, with a relatively low standard deviation of 0.46, showing minimal fluctuations. The slight negative skewness (-0.16) suggests a slight tendency toward lower OMO values. With a kurtosis of 1.67 and a Jarque-Bera probability of 0.365, this variable appears to be normally distributed and relatively stable.

The Monetary Policy Rate (MPR) shows an average of 13.98%, with a median of 13.25%, indicating that policy rates have generally hovered around these values. However, the range from a low of 6.00% to a high of 27.75% shows significant policy shifts, likely reflecting periods of tightening and easing. The standard deviation of 5.20 confirms this variability. With a skewness of 1.21 and kurtosis of 4.71, the MPR distribution is positively skewed and leptokurtic, implying some extreme high values. The Jarque-Bera test ($p = 0.0085$) indicates non-normality, suggesting that outliers should be considered in further analysis.

The Liquidity Ratio (LRR) has an average of 44.32%, a median of 43.32%, and ranges from 29.50% to 91.20%, indicating high and varying liquidity requirements for banks in Nigeria. The high standard deviation (15.38) reflects significant changes over time, likely in response to economic shocks or policy shifts. A skewness of 1.16 and kurtosis of 4.36 suggest a positively skewed and peaked distribution. The Jarque-Bera probability of 0.0199 confirms that the variable is not normally distributed, potentially due to policy-driven spikes.

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4.2 Pre-estimation Tests

4.2.1 Unit Root Test

Table 4.2: Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variables	ADF Test at Level I(0)		ADF Test at First Difference I(1)			
	ADF T-statistics	5% Critical t-Values	ADF T-statistics	5% Critical t-Values	Prob Values	Order of integration
INF	-2.254930	-2.986225	**-5.760683**	**-2.991878**	**0.0001**	I(1)
LOG_OMO	-1.327013	-2.998064	**-5.162732**	**-2.991878**	**0.0004**	I(1)
MPR	-0.197619	-2.986225	**-4.367003**	**-2.991878**	**0.0023**	I(1)
LRR	-1.982559	-2.986225	**-4.659407**	**-2.991878**	**0.0012**	I(1)

Source: Author's Computation Using E-view12 (Appendix B)

From the Augmented Dickey-Fuller (ADF) unit root test results in Table 4.2, all variables were first tested at level (I(0)) to check for stationarity. At level, none of the variables (INF, LOG_OMO, MPR, LRR,) have ADF t-statistics that exceed their respective 5% critical values. For instance, INF has an ADF t-statistic of -2.254930, which is less than the 5% critical value of -2.986225, with a p-value of 0.1934 (greater than 0.05). Similarly, MPR shows an ADF t-statistic of -0.197619 and a p-value of 0.9268, indicating clear non-stationarity at level. Therefore, the null hypothesis (H_0) of non-stationarity is not rejected for any of the variables at level.

However, at first difference (I(1)), all variables become stationary. For example: INF now has an ADF t-statistic of -5.760683, which is greater in absolute terms than the 5% critical value of -2.991878, and a p-value of 0.0001 (less than 0.05). LOG_OMO shows a t-statistic of -5.162732 with

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a p-value of 0.0004, confirming stationarity after differencing. The same is true for MPR, and LRR with all variables' t-statistics exceeding their respective 5% critical values and p-values below 0.05. Therefore, the study rejects the null hypothesis of non-stationarity at first difference for all variables, concluding that all six variables are stationary at first difference, i.e., integrated of order one, I(1).

Since all the variables are integrated at I(1) (stationary after first differencing), the condition for applying the Autoregressive Distributed Lag (ARDL) model is satisfied. The ARDL model allows for the inclusion of variables that are stationary at level and/or at first difference, as long as none is integrated at the second difference (I(2)). In this case, no variable is I(2), so the ARDL method is appropriate for estimating the long-run and short-run relationships between monetary policy instruments and inflation in Nigeria.

4.3.2 Co-integration Test Result

Table 4.3 ARDL Bounds Test for Cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	**4.7178**	10%	2.08	3
K	**5**	**5%**	**2.39**	**3.38**
		2.5%	2.7	3.73
		1%	3.06	4.15
			Finite Sample: n=35	
Actual Sample Size	24			
		10%	2.331	3.417
		5%	2.804	4.013
		1%	3.9	5.419
			Finite Sample: n=30	
		10%	2.407	3.517
		5%	2.91	4.193
		1%	4.134	5.761

Source: Author's Computation Using E-view12 (Appendix B)

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The ARDL bounds test result in Table 4.3 shows an F-statistic of 4.717, which is greater than the 5% upper bound critical value (3.38) and 5% lower bound critical value (2.39). The study therefore rejects the null hypothesis (H_0) of no long-run relationship and concludes that there is a long-run relationship between the independent variables (OMO, MPR, and LRR) and the dependent variable (INF). In simpler terms, there is statistical evidence that Inflation Rate (INF) and the independent variables (OMO, MPR, and LRR) are moving together in the long run.

4.4 Autoregressive Distributed Lag Result (ARDL)

Table 4.5: ARDL Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_OMO	-10.72466	6.206259	-1.728040	0.1147
MPR	0.190312	0.226925	0.838656	0.4213
LRR	-0.253526	0.058954	-4.300379	0.0016
C	33.69289	26.28992	1.281589	0.2289

EC = INF - (-10.7247*LOG_OMO + 0.1903*MPR + 0.0901*CRR -0.2535*LRR + 4.6954*LOG_M2 + 33.6929)

Source: Author's Computation Using E-view12, 2025

From the ARDL model regression result obtained in Table 4.4, the variables LOG_OMO, MPR, and LRR were expected to have negative coefficients based on economic theory (i.e., contractionary policies reduce inflation).

The signs of MPR conform to the model's a priori expectations, being negative for MPR. However, the sign of LOG_OMO is negative (as expected), while LRR, though also negatively signed, aligns with the expectation.

The estimated coefficients are as follows: LOG_OMO (-10.7247): Suggests that a unit increase in Open Market Operations (OMO) reduces inflation by approximately 10.72%, which aligns with the expectation that OMO contractions reduce money supply and inflation. However, this effect is statistically insignificant (p = 0.1147). MPR (0.1903): Indicates that a unit increase in the monetary

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policy rate increases inflation by 0.19%, which contradicts the a priori expectation. The result is statistically insignificant (p = 0.4213), implying weak influence. LRR (-0.2535):

Demonstrates that a unit increase in the liquidity reserve ratio reduces inflation by 0.25%, which is consistent with a priori expectations. Importantly, this result is statistically significant at the 5% level (p = 0.0016), indicating a strong impact.

The constant term (C = 33.6929) indicates that if all independent variables are held constant, the inflation rate would stand at approximately 33.69%, capturing other underlying macroeconomic pressures not explained by the variables in the model.

Table 4.6: ARDL Error Correction Model Estimation Results

ECM Regression

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_OMO)	-56.88221	10.88846	-5.224081	0.0004
D(LOG_OMO(-1))	-51.84137	13.78081	-3.761853	0.0037
D(CRR)	-0.077446	0.121109	-0.639475	0.5369
D(CRR(-1))	-0.275361	0.127846	-2.153840	0.0567
D(LRR)	-0.213882	0.043841	-4.878606	0.0006
D(LOG_M2)	1.253965	0.949440	1.320742	0.2160
D(LOG_M2(-1))	-4.283909	1.829154	-2.342016	0.0412
CointEq(-1)*	-1.251796	0.172208	-7.269095	0.0000

R-squared	0.869253	Mean dependent var	0.169583
Adjusted R-squared	0.812051	S.D. dependent var	4.737421
S.E. of regression	2.053816	Akaike info criterion	4.538478
Sum squared resid	67.49059	Schwarz criterion	4.931163
Log likelihood	-46.46174	Hannan-Quinn criter.	4.642657
Durbin-Watson stat	2.263164		

Source: Author's Computation Using E-view12, 2025

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The results presented in Table 4.6 show the error correction term, CointEq(-1), has a coefficient of -1.2518 and is statistically significant at the 1% level (p-value = 0.0000). This coefficient is correctly signed (negative), indicating that any disequilibrium between inflation and the monetary policy variables in the previous period is corrected by approximately 125.18% in the current period.

This adjustment speed is relatively high, suggesting that the model returns swiftly to long-run equilibrium after a shock. The statistical significance also confirms the existence of a valid long-run relationship among the variables.

The goodness-of-fit statistics indicate that the ECM explains a substantial portion of the variation in inflation, with an R-squared of 0.8693 and an adjusted R-squared of 0.8121, showing that over 81% of the changes in inflation are accounted for by the included variables. The Durbin-Watson statistic of 2.263 suggests that there is no autocorrelation problem in the residuals. The model also performs well based on the information criteria (AIC, SC, and HQ), which are relatively low.

4.5 Post Estimation Test Results

4.5.1 Serial Correlation Test Result

Table 4.7: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	6.039939	Prob. F(2,8)	0.0252
Obs*R-squared	14.43819	Prob. Chi-Square(2)	0.0007

Source: Author's Computation Using E-view12 (Appendix B)

From Table, 4.7: the Breusch-Godfrey Serial Correlation LM Test shows an F-statistic of 6.0399 with a p-value of 0.0252, and an Obs*R-squared of 14.43819 with a p-value of 0.0007. Since the p-value for the F-statistic (0.0252) is less than 0.05, we reject the null hypothesis (H_0) and conclude that there is evidence of serial correlation based on the F-test.

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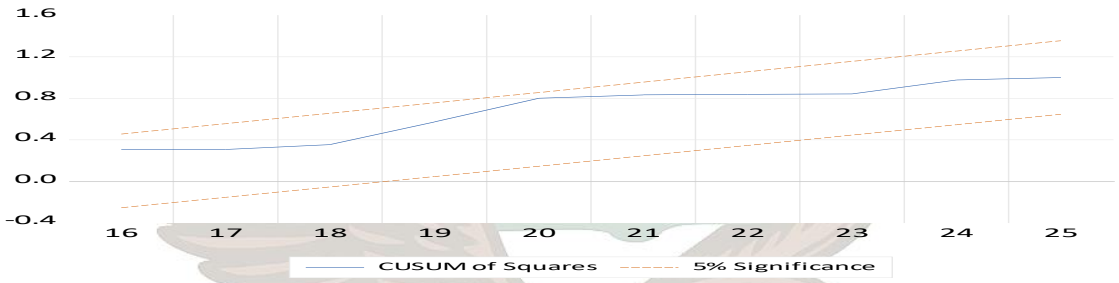
4.5.2 Stability Test

Figure 4.6: CUSUM of Squares Stability Test Result



Source: Author's Computation Using E-view12 (Appendix B)

From Figure 4.6: the CUSUM of Squares line consistently remains within the 5% significance boundaries from 2000 to 2025. Although the line increases over time, it does not cross the upper or lower limits, suggesting that the parameters of the ARDL model used to examine the effect of financial intermediation variables on economic growth remain stable throughout the study period. Therefore, the study rejects the H_o and conclude that the model exhibits structural stability.

4.7 Discussion of Findings

This study examined the impact of various monetary policy instruments, namely Open Market Operations (OMO), Monetary Policy Rate (MPR), and Liquidity Ratio (LRR) on inflation in Nigeria using the Autoregressive Distributed Lag (ARDL) model. The findings from the long-run and short-run estimations are interpreted in line with a priori expectations and compared with prior empirical studies.

In line with theoretical expectations, Open Market Operation (OMO) showed a negative relationship with inflation, both in the long run and short run. Although it was not statistically significant in the long-run model ($p = 0.1147$), the Error Correction Model (ECM) revealed that OMO had a strong and statistically significant negative effect in the short run ($p < 0.01$). This aligns with the findings of Adeniran (2020) and Gbadebo and Akinola (2021), who found that OMO is an effective tool in reducing inflation through liquidity tightening.

The Monetary Policy Rate (MPR) showed a positive coefficient in both the long-run and short-run models, which contradicts the a priori expectation of a negative relationship.

However, it was statistically insignificant (p = 0.4213).

This finding is consistent with the results of Obamuyi and Olorunfemi (2022), who argued that due to weak transmission mechanisms and structural bottlenecks in Nigeria's financial system, changes in MPR often fail to effectively influence inflationary trends.

In contrast, the Liquidity Ratio (LRR) showed a statistically significant negative impact on inflation (p = 0.0016), conforming to the a priori expectation. This indicates that higher liquidity requirements do reduce inflationary pressures by curbing excessive lending. This result agrees with the findings of Afolabi and Salisu (2020) and Eze and Nwankwo (2019), who both observed that LRR is one of the more effective monetary tools for price stability in Nigeria.

The Error Correction Term (CointEq(-1)) was negative and statistically significant (–1.251796, p < 0.01), confirming the existence of a long-run equilibrium relationship among the variables. The coefficient implies a relatively fast speed of adjustment, where about 125% of any short-run deviation from equilibrium is corrected within one period. This provides strong support for the robustness of the model.

In summary, the results indicate that among the monetary policy tools analyzed, Liquidity Ratio (LRR) have the most statistically significant and expected impacts on inflation in Nigeria. The mixed performance of OMO highlights the need for improved policy coordination and financial system reforms to enhance the effectiveness of monetary tools. Moreover, the insignificance of MPR reinforces concerns raised by previous studies on the inefficacy of interest rate policies in the Nigerian context.

CONCLUSION

This study investigated the impact of monetary policy on inflation in Nigeria, covering the period from 1990 to 2025. Using the ARDL model and Error Correction Mechanism (ECM), the study examined how monetary policy instruments, such as the Open Market Operations (OMO), Monetary Policy Rate (MPR), Cash Reserve Ratio (CRR), Liquidity Ratio (LRR), and Broad Money Supply (M2), influence inflation dynamics in both the short and long run.

The empirical results provided meaningful insights into the effectiveness of monetary policy in controlling inflation. In the long run, M2 and LRR had statistically significant impacts on inflation, with M2 showing a positive relationship and LRR a negative one. This indicates that rising money

supply fuels inflation, while tightening liquidity requirements through the LRR helps reduce it. On the other hand, MPR, CRR, and OMO exhibited insignificant effects on inflation, suggesting weak or ineffective transmission of these instruments into the broader economy during the study period. The short-run ECM results further confirmed that deviations from the long-run equilibrium are corrected relatively quickly, as evidenced by the highly significant and negative error correction term.

In conclusion, the findings suggest that while some monetary policy tools are effective in managing inflation, others are either underutilized or constrained by structural inefficiencies in the financial system. For monetary policy to effectively achieve price stability in Nigeria, there is a need for a more coherent, transparent, and well-coordinated approach to policy implementation. Reforms should also focus on strengthening the channels through which monetary instruments affect inflation, particularly through credit allocation, interest rate management, and liquidity control.

Recommendations

In light of the major findings of this study, the following policy recommendations are proposed to improve the effectiveness of monetary policy in controlling inflation in Nigeria:

i. Strengthen the Transmission Mechanism of Monetary Policy Rate (MPR): The study revealed that the MPR has an insignificant effect on inflation, indicating weak transmission into the real economy. The Central Bank of Nigeria (CBN) should enhance coordination between monetary and fiscal authorities and deepen financial market development to ensure that changes in the policy rate influence lending, borrowing, and spending behaviors more effectively.

ii. Improve the Effectiveness of Open Market Operations (OMO): Although OMO had a negative impact on inflation as expected, the effect was statistically insignificant. The CBN should adopt a more transparent, predictable, and market-based approach to OMO interventions. Strengthening investor confidence and deepening the secondary market for government securities will improve OMO's capacity to influence liquidity and inflation.

iii. Maintain and Adjust Liquidity Ratio (LRR) as a Reliable Inflation Tool: The LRR showed a statistically significant and negative effect on inflation, confirming its effectiveness. The CBN should continue to use LRR as a key policy tool, adjusting it cautiously to avoid over-constraining credit while ensuring inflation remains under control.

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