Effect of Monetary Policy Instruments on Inflation in Nigeria

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Abstract

This study examined the effect of monetary policy instruments on inflation in Nigeria; the study used annual time series data covering the period of 1990 to 2022 and the study used time series data majorly sourced from CBN Statistical bulletin and National Bureau of Statistical; the study examined how monetary policy instruments influences inflation in Nigeria. Also, the study used data analysis comprising of both descriptive and analytic tool. The Auto-Regressive Distributed Lag (ARDL) model was adopted for the study, and it was discovered that money supply, monetary policy rate, and cash reserve ratio are the major instruments that influence inflation, while liquidity ratio had a positive relationship with inflation but statistically insignificant. The study therefore recommended that; the government through CBN should resort to cashless economy in order to reduce the circulation of money in the country.

Keywords: Inflation, Monetary policy, Money supply and Auto-Regressive Distributed Lag

JEL Classification: E31, E52, E51, C52

1.0 Introduction

Monetary policy serves as a pivotal tool wielded by central banks to navigate the complex terrain of economic stability, with the overarching goal of achieving price stability, sustainable growth, and employment. In Nigeria, where economic dynamics are influenced by a myriad of internal and external factors, the efficacy of monetary policy instruments in curbing inflation holds profound significance. It is worthy of note that Inflation is characterized by a persistent rise in the general price level of goods and services; it remains a formidable challenge for Nigeria's economic landscape. The nation has witnessed fluctuations in inflation rates over the years, driven by factors ranging from fiscal imbalances and exchange rate volatilities to supply-side constraints and global economic shocks. Against this backdrop, the CBN assumes a pivotal role in formulating and executing

monetary policies tailored to mitigate inflationary pressures and steer the economy toward sustainable growth trajectories (Ebipre and Amaegberi, 2020).

Okwori (2021) noted that Central to the arsenal of monetary policy tools at the disposal of the CBN are a diverse array of instruments wielded with precision to influence the money supply, interest rates, and overall economic activity. These instruments include the manipulation of benchmark interest rates, open market operations, reserve requirements for commercial banks, exchange rate policies, and targeted intervention programs. Each instrument serves as a lever through which the CBN can modulate the flow of money within the economy, thereby influencing aggregate demand, credit creation, and ultimately, the trajectory of inflation. One possible reason for this is that as the general price level rises, the value of money declines, resulting in a decrease in purchasing power per unit of currency. Nigeria, as a country, is currently experiencing an inflationary trend, and numerous factors have been identified as its causes. Some of these factors include excessive reliance on imported goods, inadequate production of capital goods, increased demand, rising production costs, and structural issues within the economy.

Importantly, the macroeconomic performance in the United States has witnessed a significant improvement since the early 1980s. Notably, the 1980s and 1990s marked two of the lengthiest periods of economic expansion in U.S. history, accompanied by relatively mild contractions in 1990–1991 and 2001 due to the efficacy of their monetary policy. This commendable achievement can largely be attributed to the gradual and implicit adoption of inflation-targeting policy procedures by the Federal Reserve Bank of the United States over the past two decades. Also, various countries prioritize inflation control as a primary objective of their monetary policy, they employ inflation targeting as a means to guide and shape the overall framework of their monetary policy. For instance, Australia targeted an inflation rate of 2-3% in 1993, Canada aimed for 1-3% in 1991, Finland targeted

approximately 2% in 1993, Israel set a target range of 8-11% in 1991, and the United Kingdom targeted 1-4% until October 1997, when it lowered the target to 2.5% or less thereafter. However, Nigeria has experienced persistently high inflation rates in the double digits over the past decade, which is a cause for concern. As of 2022, Nigeria's inflation rate has risen to 21.34% (World Development Indicators, 2020).

Between 2015 and 2022, the cost of services and the cost of living in Nigeria have remained high compared to the late 1980s and early 1990s. Furthermore, the inflation rate has exhibited fluctuations over time, and as of 2022, it has surged to 21.34% while the exchange rate of the Nigerian Naira to the U.S. dollar stood at ₦423.9 (NBS, 2022). Undeniably, the inflation rate has reached an unsustainable level. Goodhart and Vinals (2018) assert that for an economy to benefit and thrive, the inflation rate should ideally range between 2.0% and 3.0%. The Central Bank of Nigeria has implemented various measures in an endeavor to meet expectations and address the inflationary trend in the country. These measures include the deregulation of the financial system in 1986, the introduction of the monetary policy rate (MPR) in 2006, the shift from monetary targeting to inflation targeting in 2007, the revision of liquidity and cash reserve ratios by the CBN to combat inflation, and numerous other reforms. However, despite these concerted efforts, the inflation rate in Nigeria remains unfavorable.

Also, the Monetary Policy Committee (MPC) has made effort of reviewing the interest rate from 12% to 14% and to 18.75% in order to reduce the inflationary rate but only a dismal success has been recorded so far. Also, the federal government made effort of encouraging patronage of domestic product as well as restriction of importation of goods that can be produced locally just to ensure inflationary rate stability and such effort is yet to be achieved. Similarly, all the efforts made by the

federal government to control inflationary rate, the prices of goods and services are still at a very high rate compared to late 1970s and early 1980s when the cost of living was low, the prices of goods and services where relatively cheaper. For instance, the price of 50KG rice was sold for ₦8.50 but recently the same 50KG of rice is now sold between ₦75,000-₦85,000 (National Bureau of Statistics, 2022).

Moreover, the Monetary Policy Committee (MPC) has undertaken the task of reassessing the interest rate, elevating it from 12%, 14%, and 18.75% with the intention of mitigating the inflationary rate. However, this endeavor has only yielded meager success thus far. Additionally, the federal government has made concerted efforts to promote the consumption of domestic goods and restrict the importation of goods that can be locally produced, all in the pursuit of stabilizing the inflationary rate. Unfortunately, these efforts have not yet been accomplished. Similarly, despite the various endeavors made by the federal government to regulate the inflationary rate, the prices of goods and services remain exorbitantly high in comparison to the late 1970s and early 1980s (CBN, 2022). The prevailing consensus on this matter is that monetary policy is highly likely to exert influence on inflation. Consequently, the study is an attempt to examine the effect of monetary policy instruments on inflation in Nigeria; The rest of the study is subdivided into 2-Review of related literature, 3-Methodology, Results and discussion of findings, as well as 4- Conclusion and Recommendations.

2.0 LITERATURE REVIEW

The interdependence of monetary policy and inflation in Nigeria has been the focal point of numerous investigations conducted within the nation. Akinbode, Olabisi, Adekunle, and Jimoh (2021) scrutinized the correlation between monetary policies and inflation in Nigeria from the years 1986 to 2020. The study employed a co-integration and Multi-Variate Vector Error Correction Model approach in order to examine both the long-term and short-term relationship or nexus among

monetary policy, exchange rate, and inflation rate. Based on this approach, the paper ascertained the existence of at least one co-integrating vector among variables and the vector error correction estimate demonstrated that there is a one-way causation from the interest rate to the inflation rate. The theoretical transmission nexus deduced from the VECM estimate furthermore disclosed that a modification in monetary policy stance is the cause, and not otherwise. Based on these findings, this study proposes suitable control and management of both the interest rate and inflation rate.

Similarly, Okwori (2021) conducted a study on monetary policy instrument and inflation in Nigeria spanning 1990 to 2020 using the Auto Regressive Distributed Lag model. The results showed that money supply and interest rate had a positive influence on inflation, while exchange rate and open market operation had a negative relationship with inflation over the period of study. The study revealed that exchange rate volatility negatively influences inflationary rate in Nigeria. The study stressed that exchange rate negatively affect the inflationary rate of Nigeria due to over dependent on imported goods and the country's inability to produce commodities needed for her consumption. The study suggested that domestic production should be promoted while importation should be discouraged, the study added that government should discourage too much circulation of money and resort to cashless economy.

Mishkin (2021) conducted a study on the effectiveness of monetary policy approaches in managing inflation across various developed nations both pre and post the 2007-2019 financial crisis. The research outlined nine key principles that shaped the strategies of most central banks concerning monetary policy and inflation before the crisis. Additionally, it outlined five key takeaways from the crisis regarding monetary policy approaches and highlighted the importance of closely linking monetary policy with financial stability policy. Ahsan (2020) explored the factors influencing food

prices in Pakistan in 2019, examining both supply and demand dynamics affecting these prices. By analyzing data from 1970 to 2018 using an autoregressive distributed lag model, they found that the primary determinant of food costs in the short and long term is the money supply. Furthermore, the study revealed that subsidies, although initially having a minimal impact, could eventually contribute to lowering food prices. In the absence of imports, the local market experiences pressure from surging global food prices, resulting in an increase in domestic food prices. However, the potential for imported inflation exists if food crops are purchased at higher prices from overseas.

Ebipre and Amaegberi (2020), in their research, investigated the impact of monetary policy, money supply, and inflation in Nigeria. They utilized the time series econometric technique (Error Correction Model) to capture the convergence of the factors determining inflation in order to achieve long-run equilibrium. Yearly data from 1990 to 2019 was utilized, and it was discovered that expected inflation, measured by the lagged term of inflation, and money supply significantly determine inflation. On the other hand, trade openness, which captures the tendencies of imported inflation, income level, exchange rate, and interest rate were found to be insignificant, with all exhibiting signs that conform with a-priori in the short run. Likewise, in the long run, none of the variables were found to be significant.

Bhatt and Kishor (2015) carried out a research study that investigated the effects of monetary policy and inflation in Nigeria between 1980 and 2017. The study utilized the rational expectation framework and time series analysis to analyze the data. The results showed that the use of monetary policy to impact the government fiscal deficit's financing, by determining the inflation tax rate, influenced both inflation and the real exchange rate, leading to volatility in these rates. Furthermore,

the study revealed that inflation not only affected its own rate's volatility but also influenced the exchange rate.

Gbadebo and Mohammed (2015) conducted a study to assess the effectiveness of monetary policy in controlling inflation and food prices in Nigeria. The research employed co-integration analysis and error correction model on time series data collected from 1980 to 2013. The findings indicated that interest rate, exchange rate, money supply, and oil price were the primary drivers of inflation in Nigeria. Moreover, the study demonstrated that money supply had a significant positive effect on inflation in both the short and long term. Consequently, the study concluded that monetary impulses were the cause of inflation in Nigeria.

Kumo (2015) investigated the influence of inflation and monetary policy on economic growth in South Africa. The research utilized the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model to analyze annualized quarterly consumer price data from 1960 to 2013. The study identified three different monetary policy regimes and found that inflation volatility had a statistically significant adverse impact on economic growth between 1960 and 1998. However, during the period from 1999 to 2013, inflation volatility did not affect economic growth. The study concluded that South Africa achieved low and stable inflation rates, conducive to economic growth, by implementing an inflation-targeting monetary policy regime.

METHODOLOGY

Types and Sources of Data

This paper used secondary data sourced from CBN to carry out its analysis. Secondary data was obtained for the variables; inflationary rate, money supply, monetary policy rate, liquidity ratio and cash reserve ratio spanning 1990 to 2022.

Model Specification

Thus; the functional form of the model was presented in Equation I as;

$$INFLR = f(MPR, M2, LR, CRR) \quad (1)$$

This study is anchored on the quantity theory of money, which was formulated by Fisher (1911), is a theory that, in its simplest form, asserts that any alterations in the amount of money supply will result in a corresponding change in the overall price level or inflation rate. Consequently, the theory posits that inflation will be directly proportional to the quantity of money in circulation. The function is stated thus;

$$MV=PY \quad (2)$$

Where M = money supply, V = velocity of money in circulation, Y = real national output, and P = aggregate price level. From the equation above, it can derive another equation as follows:

$$P=MV/Y \text{ or } V=PY/M \quad (3)$$

Sequel to the above, the equation has been substituted thus ;

The ARDL model was used to examine the effect of monetary policy instruments on inflation in Nigeria. The ARDL model based on the functional form presented above in equation 1 is represented as shown in equation 4

$$\Delta INFLR_t = \alpha_0 + \sum_{i=1}^{x} \gamma_i \Delta INFLR_{t-1} + \sum_{k=0}^{x} \delta_k \Delta MPR_{t-k} + \sum_{l=0}^{x} \omega_l \Delta M2_{t-l} + \sum_{m=0}^{x} \theta_m \Delta LR_{t-m} + \sum_{n=0}^{x} \vartheta_n \Delta CRR_{t-n} + \beta_1 INFLR_{t-1} + \beta_2 MPR_{t-1} + \beta_3 M2_{t-1} + \beta_4 LR_{t-1} + \beta_5 CRR_{t-1} + \mu_t \quad (4)$$

Where α_0 and μ_t are the autonomous component and white noise respectively. The expression with the signs of summation in the equation is error correction. The parameter coefficient denotes the short run effects while Beta (β) is the corresponding relationship in the long run. Inflation rate (INFR) being the dependent variable while monetary policy rate (MPR), Broad money supply (M2), Liquidity ratio (LR), and Cash reserve ratio (CRR) represents the independent variables.

Apriori Expectation; LR, MPR, CRR>0, M2, INF<0

Estimation Procedure

Test for Stationarity: The Augmented Dickey Fuller (ADF) stationarity test was carried out to checkmate the presence of non-stationarity in the data. It is stated as follows;

$$\Delta Y_t = \alpha Y_{t-1} + u_t \quad (5)$$

where, Y_t is a time series and u_t is a sequence of innovations.

The ARDL Co-integration Approach – The stationarity test was carried out first to find out whether variables are stationary at level of first difference or not. That is I (0) and I(1); thereafter the co-integration bound test was conducted to ascertain the existence of long run and short run relationship between the dependent and independent variables (Pesaran, Shin and Smith, 2001). The third step was to estimate the short-run dynamic coefficients. Finally, the stability of the model was carried out using the Cumulative sum of recursive residuals (CUSUM). The ARDL model is stated as thus;

$$Y_t = \alpha_0 + \phi_t Y_{t-1} + \beta_t X_{t-1} + \varepsilon_t \quad (6)$$

where, Y_{t-1} and X_{t-1} are variables, ε_t is the vector of the random error term.

Bound Test: the *F*-statistics test was conducted for the collective significance of the coefficient of the lagged variables, $H_0 : \phi_1 = \phi_2 = \phi_3 = \phi_4 = \phi_5 = 0$ against the alternative of $H_1 : \phi_1 \neq \phi_2 \neq \phi_3 \neq \phi_4 = \phi_5 \neq 0$. The calculated F-statistics is compared to the critical value. The null hypothesis is rejected if the calculated F-statistics exceeds the upper limit of critical value. The null hypothesis cannot be rejected if the F-statistic goes below the lower limit of critical value, implying that there is no long-run relationship between the variables; however, if the F-statistic falls between the upper and lower limit, the result is considered inconclusive.

Residual Diagnostic Tests

Ramsey RESET Test and Breusch-Godfrey serial correlation LM test was used to validate the ARDL model's results, and the cumulative sum of recursive residuals (CUSUM) tests were used to test for serial correlation and the ARDL model's stability respectively.

RESULTS AND DISCUSSION OF FINDINGS

This section presents the results of the study, ranging from descriptive statistics, ADF unit root test results, ARDL-Bounds cointegration test results, ARDL regression results (which consists of long-run regression results and short-run regression results), and Post diagnostic test results.

Table: 1
Descriptive Statistics

	INFLR	MPR	M2	LR	CRR
Mean	19.89393939	13.85676768	9148528.638	38.31262626	11.73181818
Median	13.8	14	4027901.7	33.1	9.7
Maximum	72.8	26	26799628.38	64.1	27.75
Minimum	5.4	6.13	68662.5	25	2.1
Std. Dev.	16.36445442	3.636709296	9559049.3	10.19824674	8.04902768
Skewness	1.80086399	0.723550639	0.556722834	0.878754413	0.766464034

Kurtosis	5.543738569	5.562265166	1.710694017	2.992245384	2.165875955
Jarque-Bera	26.73419423	11.90654422	3.990347862	4.247233932	4.187743154
Probability	1.57E-06	0.002597328	0.135989999	0.119598262	0.123209197
Sum	656.5	457.2733333	301901445.1	1264.316667	387.15
Sum Sq. Dev.	8569.451788	423.2209441	2.92401E+15	3328.135572	2073.179091
Observations	33	33	33	33	33

Source: ***Author's computation using E-views version 13***

Table 1 above shows the descriptive statistics result on the effect of monetary policy on inflation in Nigeria. The result revealed that inflationary rate in Nigeria has an average of 19.89% from 1990-2022. Other monetary policy instruments averaged 13.85% for monetary policy rate (MPR), 91% for broad money supply (M2), 38.31% for liquidity ratio (LR) and 11.73% for cash reserve ratio (CRR). This simply implies that inflationary rate in Nigeria over the years has been high and not beneficial for the economy since it is above one digit. The standard deviation which shows the nature of dispersal in the worth of the variables are all high implying that MPR, M2, LR, and CRR are effective monetary policy instruments used over the years to curb inflationary rate in Nigeria. The inflationary rate, monetary policy rate, money supply, liquidity ratio, and cash reserve ratio all have positive skewness which simply implies that they have a long right tale. Two variables (INFLR and MPR) kurtosis are above 3, while M2, LR, and CRR are below 3 implying that most of the variable's distribution are fat and would turn platykurtic. The jarque bera statistics means the series are not normally distributed with probability values greater than 0.05. Therefore, the result shows that only MPR is normally distributed since it fall within 0.05%.

Figure 1: Trend of MPR and INFLR

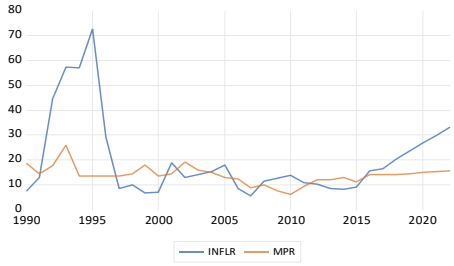
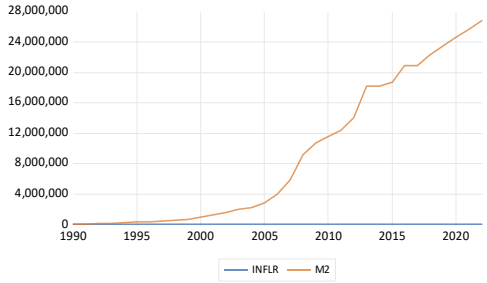


Figure 2: Trend of M2 and INFLR



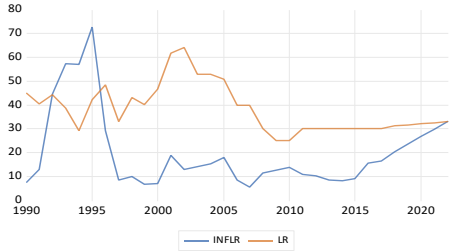


Figure 3: Trend of LR and INFLR

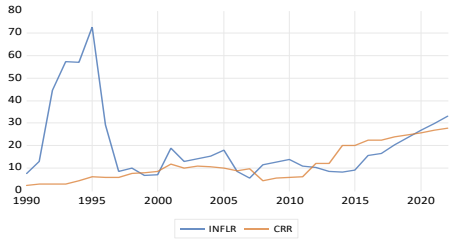


Figure 4: Trend of CRR and INFLR

The trend on figure 1 shows that monetary policy rate instrument was effective in 1996-2000, it further depicts that MPR was very weak 1990-1995. It shows clearly that the inflationary rate and MPR are interwoven which mean it could be used to curb inflation in the country. Figure 2 clearly depicts that money supply is the most effective variable used to curb inflation in the country. The trend revealed that in 1990-2000, the inflationary rate was minimal due to its ability to curb inflation. However, the trend further shows that a higher supply of money into the economy would lead to high inflationary rate. Similarly, figure 3 revealed that liquidity ratio was effective in tackling inflationary rate between 2000-2020 but had less effect on inflationary rate between 1990-1997; while figure 4 revealed that cash reserve ratio was effective in curbing inflationary rate as from 1998-2000, but became volatile from 2002 to 2022.

Unit Root Result

Table 2:

		ADF Test	
Variables	**Level**	**1st Difference**	**Remark**
INFLR	0.2619	0.0011***	1(1)
MPR	0.0328***	0.0000***	1(0)
M2	0.6413	0.0052***	1(1)
LR	0.4817	0.0002***	1(1)
CRR	0.3050	0.0297***	1(1)

Note: *** the hypotheses of a unit root is rejected at 1% significant level. H_1: individual unit root process

The Augmented Dickey Fuller (ADF) unit root test result presented above revealed that all the variables were stationary at first difference I(1) while only one variable (MPR) was stationary at level I(0). The result justify the usage of Auto regressive Distributed Lag (ARDL).

Table 3: ***ARDL Bound Test Result***

F-Bounds Test	**Null Hypothesis: No levels relationship**			
Test Statistic	**Value**	**Significance.**	**I (0)**	**I (1)**
F-statistic	23.063405	10%	2.525	3.560
		5%	3.058	4.280
		1%	4.280	5.840

Source: ***Author's computation using E-views version 13***

Table 3 above shows the ARDL bound test result, it reveals that there is existence of long-run relationship between the dependent and independent variables in the model. The F-statistics which is 23.06, is above the upper bound critical values I (1) at all the levels of significance, implying that there is a long-run relationship in the model. Therefore, a short run and long run test were conducted.

Table 4: ARDL Short-run Coefficient Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
INFLR(-1)	0.455631873	0.11065104	4.117736923	0.000646214
INFLR(-2)	-0.151462931	0.106490838	-1.422309503	0.172034759
MPR	1.081658375	0.338675555	3.193789335	0.005030697
MPR(-1)	0.78675998	0.399273849	1.97047711	0.064363302
MPR(-2)	3.366461271	0.339702095	9.91003976	1.03E-08
M2	7.19E-07	1.16E-06	0.6186258	0.543912845

M2(-1)	-2.49E-07	1.79E-06	-0.139059346	0.890947282
M2(-2)	2.79E-06	1.29E-06	2.16686374	0.043906839
LR	0.145275631	0.210119976	0.691393716	0.498139331
CRR	-1.929629973	0.700455912	-2.754820027	0.013037544
CRR(-1)	-2.031969809	0.601788436	-3.37655177	0.003361563
CRR(-2)	0.628640349	0.4469432	1.406532974	0.176596284
C	-49.75199791	12.05045493	-4.128640637	0.00063073
ECM(-1)	-1.386206	0.150252	-9.225857	0.0483

Source: ***Author's computation using E-views version 13***

The result on table 4 shows the short run of inflationary rate and monetary policy instruments. It revealed that inflationary rate has significant effect on itself at lag while it exhibits an insignificant effect at lag 2. Monetary policy rate has positive and significant effect on inflationary rate while at lag 1 and 2 it has insignificant effect on inflation. This simply implies that MPR is an effective instrument that is used to curb inflationary rate but as time progressed it became ineffective. This implies that continuous upward review of MPR renders the instrument ineffective as such, the review of MPR by CBN should not exceed 15% so that businesses and economic activities can thrive. This also implies that high MPR discourages borrowing which slows economic activities and businesses in the country. The result further revealed that money supply has not been effective in curtailing inflationary rate over the years, this is because it has an insignificant effect on inflation both at lag 1 and 2. This shows that over the years, circulation of money in the country is not the cause of inflation rather it is traceable to over dependence on imported goods and volatility of exchange rate as purported by Okwori (2021). Also, liquidity ratio was discovered to have an insignificant effect on inflationary rate while cash reserve ratio was discovered to have negative relationship with inflationary rate but statistically significant. This shows that the CBN need to review both LR and CRR upwardly to enable commercial banks lend money to small- and large-scale farmers, enterprises and corporate organizations. If the LR and CRR are reviewed upwardly, it will strengthen commercial banks in the country. The short run result revealed that monetary policy instruments influence

inflationary rate in Nigeria but recently, continuous upward review of MPR has render the instrument ineffective. The error correction model (ECM) is expected to meet three conditions, it must be negative, less than one and significant. Therefore based on the result in the table above, the ECM has a negative value of (-1.386206) and it has a probability value (P-value) of 0.0483 which is significant; this denotes that the speed of adjustment from disequilibrium in the preceding period to recent period is correctly signed and statistically significant (Narayan & Smyth 2005).

Table 5: ARDL Long-run Coefficient Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ*	-0.695831058	0.052328563	-13.29734694	2.77E-12
D(INFLR(-1))	0.151462931	0.068681847	2.205283318	0.037701498
D(MPR)	1.081658375	0.252047024	4.291494333	0.000272289
D(MPR(-1))	-3.366461271	0.289467494	-11.62984219	4.12E-11
D(M2)	7.19E-07	8.06E-07	0.891926304	0.381669159
D(M2(-1))	-2.79E-06	8.83E-07	-3.155360425	0.004425657
LR**	0.145276	0.21012	0.691394	0.498139
D(CRR)	-1.929629973	0.437615961	-4.409414063	0.00020291
D(CRR(-1))	-0.628640349	0.345529086	-1.819355803	0.08190037
C	-49.75199791	12.05045493	-4.128640637	0.00063073

Source: ***Author's computation using E-views version 13***

Table 5 shows the long run result of ARDL estimation. It shows that MPR has a positive and significant effect on INFLR. This could imply that the central bank of Nigeria through monetary policy committee can continue to use monetary policy rate to control inflationary rate in the country since it is an effective instrument. Considering the current cost of living in Nigeria, the CBN should review the monetary policy rate downwardly to encourage borrowing which would eventually stir economic activities in the country. Moreso, reducing the MPR to one digit or sightly above one digit will facilitate small and medium enterprises since the country is characterized by high level of unemployment, poverty and low standard of living. Money supply also has a positive and significant effect on inflationary rate at lag 1, though it was discovered that it is insignificant at level. This shows

that broad money supply is an effective instrument used to curtail inflationary rate in the economy. Similarly, it was discovered that liquidity ratio has a positive relationship with inflationary rate but insignificant. This implies that LR has not been effective instrument over the years in curtailing inflationary rate. The study further discovered that cash reserve ratio has a negative relationship with inflationary rate but statistically significant. This implies that CRR has influence on INFLR in Nigeria over the period of study. It is quite true that Nigeria's economy is bedeviled with the challenge of high inflation; according National Bureau of Statistic (2022) the inflationary rate in Nigeria rose to 21.34% while the exchange rate of dollar to naira remained at $1 to ₦423.9. this could be attributed to over dependence on imported goods as stressed by Okwori (2021). The result of the findings shows that MPR, M2 and CRR are effective instrument in curtailing inflationary rate over the years while LR has not been effective in curbing inflationary rate in the country. This implies that the inflationary rate in the country is not attributed to monetary policy instruments; rather this challenge can be attributed to the country's over reliant on foreign goods, her inability to produce capital goods and other commodities mostly consumed by her citizens. These findings is in consonance with the works of Okwori (2021); Ahsan, Iftikhar, and Kemal (2020).

Residual Diagnostic Test Results

For reliability of estimates, the study obtained series of residual and stability tests such as Breusch-Godfrey Serial Correlation LM Test and Jarque-Bera test. This is to ascertain the appropriateness and stability of the model as well as the robustness of the results. The decision rule not to reject the null hypothesis for any of these diagnostics tests is that the probability-value (p-value) of each has to be greater than 5 percent level of significance. Table 6 below presents the residual test results.

Table 6: Breusch-Godfrey Serial Correlation LM Test and Jarque-Bera Test

	Coefficients	**Probability**
Breusch-Godfrey Serial		

Correlation LM Test:	F Stat. 1.820685	0.1779
Jarque-Bera	0.726663	0.695356

Source: Author's Computation using EViews version 13

The test for linearity is meant to ascertain whether the model is linear or that it is correctly specified. As shown on Table 6, the outcome from the Breusch-Godfrey serial correlation LM test revealed that the null hypothesis cannot also be rejected. This is because the test shows that there is no serial correlation in the residuals; it shows that the specified lag are in order. The result revealed that the probability value of the test statistics (0.1779) is greater than 0.05 (i.e., 5% level of significance). The results indicate absence of serial correlation of second-degree problem in the estimated ARDL model. Finally, the Jarque-Bera statistic shows that the error term is normally distributed since the result revealed that the JB probability value of (0.695356) is greater than 0.05 percent level of significance.

Stability Test Result

For the stability test, the result of the CUSUM and the CUSUMSQ tests are presented on Figures 5 and 6. The plots of both tests statistic on Figures 5 and 6 were both within the 95% confidence interval indicating the model was stable.

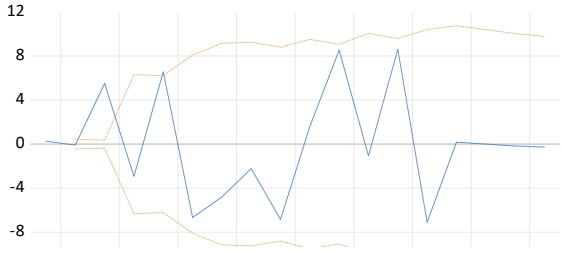


Figure 5: CUSUM Plot

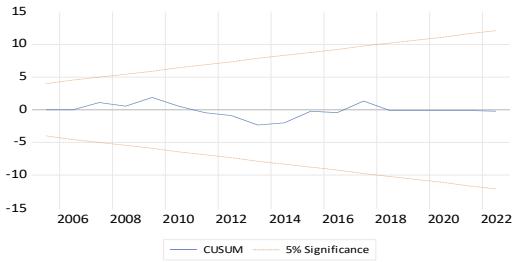


Figure 6: RECURSIVE Plot

Conclusion and Recommendations

This work examined the effect of monetary policy instruments on inflation in Nigeria; it further examined the casual relationship between monetary policy instruments and inflation based on the

time series data covering the period of 1990-2022. Augmented Dickey Fuller unit test was conducted to on all the variables and it was discovered that long run relationship exist between monetary policy instruments and inflation in Nigeria. Consequently, the study employed ARDL model to checkmate the short-run and long run effect of monetary policy instruments on inflation; it was discovered that monetary policy rate, broad money supply and cash reserve ratio are the major instruments used to curtail inflation while liquidity ratio tend to have less effect on the control of inflation in Nigeria. It was discovered empirically from the work of Okwori (2021) that money supply and interest rate are not the instruments that trigger inflation in the country rather it is traceable to the volatility of exchange rate; it stressed that over dependent on importation of goods and services negatively affects inflation. The study therefore recommended that;

- The CBN through the monetary policy committee should review the monetary policy rate downwardly to enhance economic activities considering.
- Government should resort to cashless economy to reduce the circulation of money in the economy. This will also help in curtailing crime rate in the country.
- The liquidity ratio and cash reserve ratio should be reviewed upwardly to enable commercial banks have adequate reserve requirements.

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