International Journal of Economic, Finance and Business Statistics (IJEFBS)
Vol. 3, No. 4, 2025: 191-210

Monetary Policy and Economic Stability: An Assessment Review

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A R T I C L E I N F O

Keywords: Monetary Policy, Economic Stability, Assessment Review

Received: 20, June
Revised: 21, July
Accepted: 30, August

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A B S T R A C T

This study examined the effectiveness of monetary policy in achieving economic stabilization in Nigeria, focusing on the impact of specific monetary policy tools on inflation. The primary objective is to assess how the monetary Policy rate (MPR), Cash Reserve Requirements (CRR), and the Exchange rate (EXCH) influence the inflation rate (INFR) in Nigeria. Data for the study was collected from the Central Bank of Nigeria Statistical Bulletin, the World Bank, and the National Bureau of Statistics, spanning the period from 1986 to 2023. The inflation rate served as the dependent variable, while the MPR, CRR, and EXCH were used as independent variables. The study employed a time series research design, utilizing the Autoregressive Distributed Lag (ADRL) model to analyze the relationships between these variables. The analysis revealed that, contrary to expectations, the MPR has a positive and statistically significant impact on inflation in the long run. The CRR, however, has a negative and significant influence on inflation, while exchange rate depreciation is associated with increased inflation in both the long run and the short run. The study concludes that the effectiveness of monetary policy in Nigeria is complex and influenced by factors such as transmission mechanism weakness, structural rigidities, and exchange rate volatility. It recommends that the Central Bank of Nigeria focus on enhancing the efficiency of the monetary policy transmission mechanism to improve the effectiveness of its policy tools.

DOI: https://doi.org/10.59890/ijefbs.v3i4.126
ISSN-E: 3025-9959
https://dmimultitechpublisher.my.id/index.php/ijefbs

INTRODUCTION

Monetary Policy serves as a vital instrument in managing an economy's monetary and financial framework (Gali, 2015). Central banks, such as the Central Bank of Nigeria (CBN), are entrusted with the responsibility of formulating and executing monetary policy to influence economic conditions 9 June 2021). This encompasses actions that impact the money supply, interest rates, and the overall financial environment. Monetary policy, a vital instrument in economic stabilization, enables policymakers to guide an economy towards its desired equilibrium. It seeks to strike a delicate balance between various macroeconomic objectives, notably price stability and full employment. According to Appah & Tebepah (2023), price stability is defined as maintaining inflation within a predetermined range, ensuring that consumer prices do not spiral out of control. Full employment, on the other hand, aims to maximize employment opportunities and minimize unemployment, thereby promoting economic prosperity. While achieving the twin goals of price stability and full employment is essential for sustainable economic growth and financial well-being, central banks, entrusted with a dual mandate, acknowledge the delicate balance between controlling inflation and fostering job creation, thereby conferring on them the responsibility of managing monetary policy instruments. According to Jume (2021), by skillfully wielding these tools, central banks endeavor to maintain macroeconomic equilibrium, upholding the welfare of citizens.

The effectiveness of monetary policy is contingent upon efficient transmission mechanisms that effectively relay policy changes to the real sector. However, structural issues inherent in the Nigerian economy, such as limited financial inclusion and a larger informal sector, may hinder this transmission (CBN, 2023).

The CBN has made efforts to mitigate these issues by promoting mobile banking, expanding agent networks, and introducing initiatives to enhance credit information sharing (CBN, 2023). Nevertheless, these efforts have not completely addressed the challenges hindering the effectiveness of monetary policy in Nigeria. In light of these issues, this study aims to bridge the knowledge gap by evaluating the effectiveness of Key CBN monetary policy tools and their transmission mechanisms in achieving national economic stabilization goals.

LITERATURE REVIEW

Research Questions

From the stated objectives above, the following research questions were raised;

1. How does the Monetary policy rate affect the inflation rate in Nigeria?
2. What is the influence of cash reserve requirements on the inflation rate in Nigeria?
3. How does the Exchange rate impact the inflation rate in Nigeria?

Research Hypothesis

Following the research questions, the following hypotheses will be tested

- Hypothesis one:

Null Hypothesis (H0): There is no significant impact of the Monetary policy rate on the inflation rate in Nigeria

- Hypothesis two:

Null Hypothesis (H0): Cash reserve requirements do not significantly influence the inflation rate in Nigeria.

Alternative Hypothesis (HI): Cash reserve requirements significantly influence the inflation rate in Nigeria.

- Hypothesis three:

Null Hypothesis (H0): There is no significant impact of the Exchange rate on the inflation rate in Nigeria.

Alternative Hypothesis (HI): There is a significant impact of the Exchange rate on the inflation rate in Nigeria.

Monetary Policy

Monetary policy is a crucial economic instrument employed by a central bank to influence the supply of money and credit in an economy. It plays a pivotal role in achieving macroeconomic objectives, such as price stability, economic growth, and employment. Monetary policy actions involve adjusting the money supply and interest rates to influence consumption, investment, and overall economic activity in Nigeria. The Central Bank of Nigeria (CBN) assumes the pivotal role of formulating and executing policy. Acting as the lender of last resort, it exercises regulatory oversight over the banking system and supervises the nation's monetary and financial infrastructure. The trajectory of monetary policy in Nigeria demonstrates adaptability to dynamic economic circumstances, addressing evolving challenges and policy imperatives (Adegorila, 2018).

The operational framework of monetary policy in Nigeria encompasses a suite of instruments wielded by the CBN. These include the establishment of the economic policy rate (MPR), DETERMINATION OF CASH Reserve Requirements (CRR) for banks, execution of open market operations (OMO), and management of liquidity ratios. These tools wield influence over credit availability and its cost, thereby shaping interest rates, inflation dynamics, and ultimately, economic expansion 9 adeoye & Shobande, 2017).

The execution of monetary policy in Nigeria demands attention to prevailing economic indicators, market dynamics, and potential ramifications. The efficacy of monetary policy hinges upon its transmission mechanisms. Delineating the pathways through which policy intervention manifests in output levels, employment rates, and price indices. Despite concerted endeavours by the CBN, the realization of policy objectives encounters impediments in the form of structural constraints, fiscal policy alignment, and external perturbation, all of which can impede the seamless execution of monetary policy in Nigeria (Ajibola & Ferp, 2016).

Overview of the role of the Central Bank of Nigeria (CBN)

The Central Bank of Nigeria (CBN) plays a pivotal role in the country's economic and financial landscape. As the apex bank, the CBN is entrusted with the responsibility of formulating and implementing monetary policy, ensuring

price and financial system stability, and promoting sustainable economic growth. Established in 1958, the Central Bank of Nigeria (CBN) serves as a lender of last resort, providing liquidity support to banks and maintaining the integrity of the financial system, as noted by Osagioduwa, Solomon, and Familayo (2022). The CBN also oversees the banking industry, issuing licences, setting prudential guidelines, and enforcing regulations to safeguard the stability of the financial sector.

Evolution of Monetary Policy in Nigeria

Monetary policy in Nigeria has undergone a significant transformation over the years, adapting to the country's economic landscape and changing priorities. In the early post-independence era, Nigeria's monetary policy heavily relied on direct controls, overseen by the Central Bank of Nigeria (CBN), which directly influenced factors such as interest rates, credit allocation, and money supply through administrative measures (Ikechukwu, Itoro, & Christiana, 2016). However, this approach exhibited inherent limitations, including inefficiencies and a lack of adaptability to changing economic conditions. During the 1980s, Nigeria initiated a transition towards a more market–oriented monetary policy framework (Ajobola & Ferp, 2016). The CBN introduced indirect instruments, such as open market operations, discount rates, and reserve requirements, enabling the central bank to better manage liquidity and influence interest rates. Starting from the late 1990s, Nigeria intensified its efforts to reform its monetary policy framework, adopting various strategies, such as monetary targeting, interest rate targeting, and inflation targeting (Obadeyi, Okhiria, & Afolabi, 2016). These strategies aimed to stabilize prices, foster sustainable economic growth, and enhance financial stability within the Nigerian economy.

Implementation of Monetary Policy in Nigeria

The implementation of monetary policy in Nigeria is a complex process that involves the coordination of various tools and strategies by the Central Bank of Nigeria (CBN). The primary objective is to achieve price stability, promote economic growth, and maintain financial system stability. The CBN's monetary policy committee (MPC) plays a pivotal role in the implementation process. According to Adeoye et al (92017), the committee meets regularly to assess economic conditions, review key indicators, and make decisions regarding the appropriate course of action for monetary policy. As noted by Ajibola and Ferp (2016), the MPC evaluates factors such as inflation rates, economic growth projections, exchange rate movements, and global financial developments to determine the optimal stance of monetary policy. Based on the MPC's decisions, the CBN employs a range of instruments to influence the money supply, interest rates, and credit conditions in the economy.

Challenges and Constraints in Monetary Policy Implementation

Despite the Central Bank of Nigeria's (CBN) efforts to implement effective monetary policy, several challenges and constraints hinder its smooth execution. These obstacles can limit the desired impact of actions on the economy. One of the primary challenges is the limited transmission of monetary policy through the various channels, as noted by Obadeyi, Okhiriria, and Afolabi 92016). Factors such as underdeveloped financial markets,

structural rigidities, and inefficient credit allocation can weaken the transmission mechanisms, diminishing the impact of policy decisions on key economic variables like inflation, interest rates, and credit growth. External shocks, such as fluctuations in global commodity prices, capital flows, and exchange rate volatility, can also undermine the CBN's ability to achieve its policy objectives, as posited by Ikechukwu, Itoro, and Christiana (2016). Nigeria's reliance on oil exports and susceptibility to global economic cycles can create instability and complicate monetary policy implementation.

Inflation Rates

Inflation is a crucial economic indicator that measures the sustained increase in the general price level of goods and services within an economy over a specific period. The significance of maintaining low and stable inflation rates is a primary objective of monetary policy authorities. They argue that excessive or volatile inflation can lead to the erosion of purchasing power and the decline in the value of a currency, thereby posing detrimental effects on economic stability and growth.

Types and Measures of Inflation

Inflation can manifest in various forms, each with distinct characteristics and implications for the economy. Understanding the different types of inflation and their appropriate measures is crucial for policymakers and analysts to devise effective strategies for maintaining and controlling price increases. According to Salim (2019), inflation can be categorized into two main types based on its underlying causes: demand-pull inflation and cost–push inflation. Demand-pull inflation occurs when the aggregate demand for goods and services surpasses the available supply, resulting in upward pressure on prices. Conversely, cost-push inflation arises from increases in production costs, such as raw materials, labor, or energy, which are then passed on to consumers in the form of higher prices. In the study by Boug, Cappelen, and Sweasen (2017), inflation dynamics in a small open economy are examined. They categorize inflation into three types: consumer price inflation, producer price inflation, and asset price inflation. Consumer price inflation represents changes in the prices of goods and services consumed by households, typically tracked through the Consumer Price Index (CPI). Producer price inflation focuses on the prices set by domestic producers for their output, as measured by the Producer Price Index (PPI). Asset price inflation reflects fluctuation in the prices of financial assets, such as stocks, bonds, and real estate.

Causes of Inflation in Nigeria

Inflation in Nigeria is driven by a multitude of factors, both domestic and external, that have contributed to persistent price increases over the years. Understanding these underlying causes is crucial for policymakers to devise effective strategies to manage inflationary pressures.

In Nigeria is primarily driven by several factors as elucidated by Inim, Samuel, and Prince (2020). The heavy reliance on imported goods, especially consumer items and industrial inputs, is a significant contributor. Fluctuations in exchange rates and global commodity prices directly influence the cost of imported goods, thereby creating inflationary pressures known as cost–push

inflation. Moreover, deficiencies in infrastructure hinder domestic production, thereby exacerbating dependence on imports.

External factors, such as global economic conditions, oil price volatility, and capital flows, also significantly influence inflation dynamics in Nigeria, according to Adeleye et al (2019), Being a major oil exporter, Nigeria's foreign exchange earnings are directly impacted by fluctuations in oil prices, which in turn affect import costs and exchange rate stability.

Impacts of Inflation on the Economy

Inflation can have far-reaching consequences on various aspects of an economy, affecting individuals, businesses, and overall macroeconomic performance. When inflation rates are high and persistent, the repercussions can be detrimental to economic stability and growth. The profound impact of inflation emphasizes its primary consequences – the erosion of purchasing power. As prices escalate, the real incomes of consumers decline, resulting in a decrease in living standards and a reduced ability to afford essential commodities. This downward trend in purchasing power has a ripple effect, as households trim non-essential expenditures. This thereby dampens consumers' demand and negatively affects businesses.

Monetary Policy Rate (MPR)

The monetary policy rate (MPR) stands as a pivotal instrument utilized by the Central Bank of Nigeria (CBN) in executing monetary policy endeavours/ As the principal interest rate designated by the Central bank, the MPR acts as a benchmark for ganging the cost of borrowing and lending within the interbank market and the broader financial system (Adeoye & Shobande, 2017).

Role of MPR in Monetary Policy Transmission

The determination of interest rates, credit conditions, and subsequent economic activity and inflation in Nigeria is significantly influenced by the Monetary Policy Rate (MPR). Posited by Anacleto, Okeke, and Ubah (2023), the MPR serves as a crucial mechanism through which the Central Bank of Nigeria (CBN) influences interest rates across the financial system. This assertion aligns with the findings of Alpha and Telepath (2023), who demonstrate the direct impact of MPR adjustments on borrowing and lending costs in the interbank market, consequently affecting other interest rates affected by commercial banks.

However, the effectiveness of the MPR in transmitting monetary policy impulses depends on several factors, including the responsiveness of financial markets and the health of the banking sector (Bgadebo and Mohammed, 2015). A well-functioning financial system and efficient transmission mechanism are essential to the MPR to influence economic conditions and achieve desired policy objectives effectively.

Impact of MPR on Inflation in Nigeria

The Central Bank of Nigeria (CBN) significantly adjusts the monetary policy rate (MPR) to influence inflationary pressures within the Nigerian economy. As the key interest rate determines borrowing costs, changes to the MPR can directly I'm [pact aggregate demand and supply dynamics, affecting price levels. In the pursuit of its primary mandate of inflation control, the CBN

actively calibrates MPR setting in response to prevailing economic conditions, as highlighted by Okotori (2019). However, Okotori emphasizes that effective inflation control requires complementary demand–management fiscal policies and supply-side measures. The impact of MPR adjustments also hinges on the CBN's foresight in interpreting leading macroeconomic indicators and understanding the dynamics between growth and inflation.

Critiques and Limitations of MPR as a Policy Tool

While the monetary policy rate (MPR) is one of the major tools employed by the Central Bank of Nigeria (CBN) to achieve its macroeconomic objectives, there are several limitations and critiques regarding its efficacy as a policy instrument. One primary constraint identified in the empirical analysis conducted by Adegoriba (2018) pertains to the inefficiency of the monetary policy transmission mechanism, coupled with unresponsive loan and deposit rates to notification in the Monetary Policy Rate (MPR). Structured rigidities are observed to dampen the pass-through effect from adjustments in the policy rate to market interest rates, thereby limiting the Central Bank of Nigeria's (CBN) capacity to influence consumption and investment expenditure. This situation undermines the overall potency of the MPR in stabilizing the economy (Adegoriba, 2018).

Cash Reserve Requirements (CRR)

The Cash Reserve Requirement (CRR) refers to a monetary policy instrument used by the Central Bank of Nigeria (CBN) to regulate the liquidity positions of deposit money banks. It sets the minimum ratio of customer deposits that banks must hold in cash balances with the CBN. By modifying the Cash Reserve Ratio CRR), the Central Bank of Nigeria (CBN) possesses the capacity to adjust the overall liquidity within the banking system. The CRR functions as an administrative tool for the CBN, facilitating its ability to regulate money supply, manage liquidity in the banking system, and promote financial stability, in alignment with its monetary policy goals (Rapu et al, 2016). It operates in conjunction with other instruments, such as open market operations, to fine-tune overall liquidity conditions. While adjustments to the CRR are made periodically, its effectiveness hinges on the prevailing economic circumstances and the broader monetary policy framework (Rapu et al, 2016). The CBN considers factors such as economic conditions, inflation, and output growth projections, as well as assessments of financial stability, when determining the appropriate levels of the CRR that support its policy objectives.

METHODOLOGY

Model Specification

Following the model by Gbadebo and Mohammed (2015) with modification, the mathematical equation is expressed as follows:

INF = f (MPR, CRR, ERT)

The econometric model is represented as follows:

$INF = a + \beta 1MPR + \beta 2CRR + \beta 3ERT + E$

Where:

INF: Represents the inflation rate in Nigeria at the time

MPR: Denotes the Monetary Policy Rate
CRR: Signifies the Cash Reserve Requirement
ERT: Stands for the Exchange Rate
S is the intercept, capturing the baseline level of the inflation rate
β1, β2, and β3 are the coefficients to be estimated, representing the marginal impact of each respective variable on the inflation rate.

E is the error term, accounting for any unmeasured factors influencing the relationship between monetary policy variables and the inflation rate.

This model enables the analysis of how variations in the Monetary Policy Rate, Cash Reserve Requirement, and Exchange Rate contribute to changes in Nigeria's inflation rate. Estimating the coefficients provides insights into the relative importance of each variable, aiding in understanding their individual impacts on inflation. The error term accounts for any other factors that affect the relationship but are not explicitly included. By utilizing this econometric model, a comprehensive understanding of the dynamics between monetary policy variables and the inflation rate in Nigeria can be attained.

RESULT AND DISCUSSION

Economic a Priori Expectations

Considering the nature of monetary policy instruments and their intended effects on economic variables, the anticipated relationships between the variables of interest and the inflation rate (INF) are as follows:

Table 1. Economic a Priori Expectations

Variables	A priori Expectation
Monetary Policy Rate (MPR)	B1 <0: Positive effect (inverse relationship)
Cash Reserve Requirements 9CRR)	B2 <0: Negative effect (Inverse relationship
Exchange Rate (ERT)	B 0: Positive effect

1. Lower Monetary Policy Rate 9MPR) is expected to lead to lower inflation, as it reduces the cost of borrowing and encourages spending and investment.
2. Decreased cash Reserve Requirements 9CRR) may increase the money supply, potentially leading to higher inflation due to increased liquidity in the economy.
3. A depreciation of the Exchange Rate (ERT) could lead to higher import costs, potentially increasing inflationary pressures.

Diagnostic Tests

To ensure the model's robustness and validity, the following diagnostic tests were undertaken

Stationarity Test

Decision Rule: we reject the null hypothesis 9non-stationary) if the test statistic is less than the critical value at 55 significance level.

Coefficient of Multiple Determination (R1)

The statistic measures the proportion of variance in youth unemployment explained by the independent variables.

Decision Rule: A higher R2 (Closer to 1) indicates a better model fit. An R1above 0.7 is generally considered good in this context.

Test of Overall Significance (F. F-Statistic)

The F-statistic tests the model's overall significance by assessing if at least one coefficient is significantly different from zero

Decision rule: We reject the null hypothesis of no overall significance if the probability associated with the F- F-statistic is less than the 5% significance level.

Test for Normality

1. Test for Heteroscedasticity

This test assesses the presence of heteroscedasticity (unequal variance) in the residuals.

Decision rule:

We reject the null hypothesis of homoscedasticity if the probability associated with the test statistic is less than 5% significance level.

2. F – Bounds attest

The f- F-Bounds test is used to determine the existence of a long-term relationship among the variables in the ARDL model

Decision Rule: We reject the null hypothesis of no long-run relationship if the F-statistic exceeds the upper bound critical value at 55 significance level.

3. ARDL Long Run Test

The test examines the long-run coefficients in the ARDL model to determine the long-term effects of the independent variables of youth unemployment

Decision Rule: We consider a long-run relationship significant if the probability associated with the t- t-statistic for each coefficient is less than the 5% significance level.

4. Explanatory Power of the Model

Table 2 presents the R-squared and Adjusted R-squared values, which measure the goodness of fit of the econometric model.

Table 2. Explanatory Power of the Model

Test Type	Variables	Test Statistic
R-squared (R^2)	All	0.731821
Adjusted R-squared	All	0.615222

Source: 2024

The Adjusted R-squared value of 0.615222 indicates that approximately 61.52% of the variation in the inflation rate in Nigeria is explained by the independent variables included in the model (MPR, CRR, and EXCH). This suggests that the model has a moderately strong explanatory power, implying that these three monetary policy factors play a substantial role in determining the level of inflation in Nigeria. However, a significant portion of the variation in inflation remains unexplained, suggesting the influence of other factors not included in the model.

Overall Significance of the Regression

Table 3 presents the F-statistic and its associated p-value, which test the overall significance of the regression model.

Table 3. Overall Significance of the Regression

Test Type	Test Statistic	*p*
F-statistic	6.276376	0.000137

The F-statistic of 6.276376, with a p-value of less than .001, indicates that the overall regression model is statistically significant. This means that we can reject the null hypothesis, which states that all coefficients are simultaneously equal to zero. Therefore, we can conclude that MPR, CRR and EXCH, as a group, have a statistically significant impact on the inflation rate in Nigeria.

Test for Autocorrelation

This analysis examines autocorrelation in the inflation model using the Breusch-Godfrey Serial Correlation LM Test and the Durbin-Watson statistic. Decision Rules:

Breusch-Godfrey LM Test: Reject the null hypothesis (H_0) of no serial correlation if the p- p-value is less than 0.05 for both the F-statistic and R-squared. Durbin-Watson Test: Values around 2 generally indicate no autocorrelation. Values significantly below 2 suggest positive autocorrelation, while values significantly above 2 suggest negative autocorrelation.

Table 4. Breusch-Godfrey LM Test and Durbin-Watson Statistic

Test Type	Variables	Test Statistic	*p*	Obs*R-squared	Prob. Chi-Square
Breusch-Godfrey Serial Correlation LM Test	Residuals	*F* (2, 18) = 0.175759	0.8402	0.651261	0.7221
Autocorrelation Test (Durbin-Watson statistic)		1.814060			

Source: 2024

The Durbin-Watson statistic of 1.814060 is close to 2, suggesting no significant positive or negative autocorrelation in the residuals.

The Breusch-Godfrey LM test assesses whether residuals are correlated with their own lagged values. The null hypothesis is no serial correlation at up to 2 lags. With F (2, 18) = 0.175759 (p = .8402) and χ^2 (2) = 0.651261 (p = .7221), we fail to reject the null hypothesis. This indicates no significant serial correlation in the residuals, supporting the assumption of independent errors, which is important for unbiased and efficient coefficient estimates. The absence of autocorrelation suggests our model adequately captures the dynamic relationship between the chosen monetary policy variables and inflation in Nigeria.

Test for Heteroskedasticity

This test checks if the variance of the errors is constant across all levels of the independent variables in the inflation model. The presence or absence of

heteroskedasticity was determined using the Breusch-Pagan-Godfrey test. Decision Rule:
If p-value < significance level (e.g., 0.05): Reject the null hypothesis of homoscedasticity, indicating heteroscedasticity is present.
If p-value ≥ significance level: Fail to reject the null hypothesis, suggesting no evidence of heteroscedasticity.

Table 5. Heteroskedasticity Test: Breusch-Pagan-Godfrey

Test Type	Variables	Test Statistic	*p*	Obs*R-squared	Prob. Chi-Square
Heteroskedasticity Test: Breusch-Pagan-Godfrey	Residuals	*F* (13, 20) = 1.678257	0.1444	17.73880	0.1677

Source: 2024

The Breusch-Pagan-Godfrey test yielded an F-statistic of 1.678257 (p = .1444) and a Chi-square statistic of 17.73880 (p = 0.1677). Both p-values are greater than the conventional significance level of 0.05. Therefore, we fail to reject the null hypothesis of homoscedasticity. The results indicate no significant heteroskedasticity in the residuals of the model. This confirms that the variance of the errors is relatively constant across different levels of the independent variables. As a result, the standard errors and confidence intervals derived from the model are considered reliable.

Test for Normality

The normality of the residuals in the inflation model was assessed using the Jarque-Bera test. This examination is crucial because many statistical tests rely on the assumption of normally distributed residuals for valid inferences. Decision Rule:
If the p-value is less than the significance level (typically 0.05), we reject the null hypothesis of normality, indicating that the residuals are not normally distributed.
If the p-value is greater than or equal to the significance level, we fail to reject the null hypothesis, suggesting that the residuals are normally distributed.

Table 6. Normality Test (Jarque-Bera)

Test Type	Variables	Test Statistic	*p*
Normality Test (Jarque-Bera)	Residuals	JB = 1.934459	0.380135

Source: 2024

The Jarque-Bera test resulted in a test statistic of 1.934459 with an associated p-value of 0.380135. Since the p-value is greater than the significance level of 0.05, we fail to reject the null hypothesis of normality. This suggests that the residuals of the model are normally distributed. This finding supports the validity of the statistical inferences drawn from the model.

Test for Multicollinearity

Multicollinearity, the presence of high correlations among independent variables, was assessed using Variance Inflation Factors (VIFs). High

multicollinearity can make it difficult to isolate the individual effects of each independent variable on the inflation rate. Decision Rule:
VIF > 10: Indicates problematic multicollinearity.
VIF < 5: Suggests no serious multicollinearity.

Table 7. Multicollinearity Test (VIF)

Test Type	Variables	Centered VIF
Multicollinearity Test (VIF)	INF (-1)	2.306502
	MPR	2.122320
	MPR (-1)	2.229717
	MPR (-2)	2.369331
	MPR (-3)	3.973535
	CRR	1.526370
	CRR (-1)	1.918970
	CRR (-2)	2.592708
	CRR (-3)	2.903794
	CRR (-4)	1.767227
	ERT	1.315338
	ERT (-1)	4.852275
	ERT (-2)	4.356849

Source: 2024

Most variables exhibit VIF values below 5, indicating no serious multicollinearity concerns. However, ERT (-1) and ERT (-2) show slightly elevated VIFs, exceeding 5 but remaining below the problematic threshold of 10. While these lagged exchange rate variables show some degree of correlation, it doesn't reach a level that would significantly compromise the interpretation of individual coefficient estimates. The ARDL model structure, which inherently incorporates lagged variables, can contribute to some level of multicollinearity. Considering this, the observed VIF values are deemed acceptable, and the findings regarding the influence of the independent variables on the inflation rate remain robust.

Test for Stationarity

Before analysing the determinants of inflation, the stationarity of each time series variable (1986-2023) was assessed using the Augmented Dickey-Fuller (ADF) test. This examination is essential to prevent spurious regression results that can arise from non-stationary data.

Decision Rule for the ADF Test: If the absolute value of the ADF test statistic exceeds the critical value at the chosen significance level (e.g., 1%, 5%, 10%), and the p-value is less than the significance level, then the null hypothesis of a unit root is rejected, indicating the series is stationary.

Table 8. Unit Root Test Results

Variable	Null Hypothesis	Lag Length	ADF Test Statistic	*p*	Decision

D (CRR)	D (CRR) has a unit root	0	-6.271973	0.0000	Reject null, stationary at first difference
D (ERT)	D(ERT) has a unit root	1	-8.998983	0.0000	Reject null, stationary at first difference
INF	INF has a unit root	0	-3.209297	0.0274	Reject null, stationary at level
MPR	MPR has a unit root	0	-3.250917	0.0248	Reject null, stationary at level

Source: 2024

The ADF test revealed that the variables CRR and ERT were non-stationary at their levels. However, after first differencing, the ADF tests for D (CRR) (ADF = -6.272, $p < .001$) and D (ERT) (ADF = -8.999, $p < .001$) were statistically significant, indicating that these variables are integrated of order one, I (1). In contrast, both INF (ADF = -3.209, $p = .0274$) and MPR (ADF = -3.251, $p = .0248$) were stationary at their levels, I (0).

The presence of a mix of I (0) and I (1) variables suggests the suitability of using the Autoregressive Distributed Lag (ARDL) model. The ARDL approach accommodates variables with different integration orders, offering both short-run and long-run dynamic analyses. This allows for a comprehensive investigation of the relationships between the independent variables and the inflation rate in Nigeria.

F-Bounds Test for Cointegration

The presence of a long-run relationship among the variables in the inflation model was examined using the F-bounds test, a key component of the ARDL cointegration approach. This test is particularly robust when dealing with variables that have mixed orders of integration, as indicated by the previous ADF test results.

Null Hypothesis (H_0) of the F-bounds Test:

There is no long-run relationship (no cointegration) among the variables.

Decision Rule for the F-bounds Test at the 5% Significance Level:

If F-statistic < I (0) bound at 5%: Do not reject H_0, indicating no cointegration.

If I (0) bound at 5% < F-statistic < I (1) bound at 5%: The test is inconclusive.

If F-statistic > I (1) bound at 5%: Reject H_0, indicating the presence of cointegration.

Table 9. F-Bounds Test for Cointegration

Test Statistic	Value	5%	I(0) Bound	I(1) Bound
F-statistic	7.244637		3.23	4.35

Note. k = 3, representing the three independent variables in the model: MPR, CRR, and ERT. Source: 2024

The calculated F-statistic (7.244637) is compared to the critical values for the I (0) and I (1) bounds at the 5% significance level. As shown in Table 4.8, the F-statistic exceeds the I (1) bound (7.244637 > 4.35). Therefore, we reject the null hypothesis of no cointegration ($p < .05$). This indicates there is a long-run equilibrium relationship between the inflation rate (INF), monetary policy rate

(MPR), cash reserve requirement (CRR), and exchange rate (ERT) in Nigeria. This finding strongly supports the use of the ARDL model for further analysis of both the short-run and long-run dynamics between these variables.

Regression Results

1. ARDL Long-Run Form Estimates

The estimated long-run coefficients from the ARDL model, along with their associated standard errors, t-statistics, and p-values, are presented in Table 4.9. These coefficients represent the long-term equilibrium relationships between the independent variables and the inflation rate in Nigeria.

Table 10. ARDL Long-Run Form: Levels Equation

Variable	Coefficient	Standard Error	*t*-Statistic	*p*
MPR	6.449872	1.328036	4.856699	0.0001
CRR	-3.936233	1.109119	-3.548973	0.0020
ERT	0.208946	0.072639	2.876495	0.0093

Source: 2024

The long-run ARDL model estimates the following equation:

$$\mathbf{INF = \beta_0 + (6.4499)\ MPR + (-3.9362)\ CRR + (0.2089)\ ERT + \varepsilon}$$

Monetary Policy Rate (MPR): The coefficient of MPR is positive and statistically significant ($\beta = 6.4499$, $p < .001$), suggesting that a 1% increase in the monetary policy rate is associated with a 6.4499% increase in the inflation rate in the long run, holding other factors constant. This finding contrasts with the a priori expectation of a negative relationship.

Cash Reserve Requirement (CRR): The coefficient of CRR is negative and statistically significant ($\beta = -3.9362$, $p = .0020$). This suggests that a 1% increase in the cash reserve requirement is associated with a 3.9362% decrease in the inflation rate in the long run, consistent with the a priori expectation of a negative relationship.

Exchange Rate (ERT): The coefficient of ERT is positive and statistically significant ($\beta = 0.2089$, $p = .0093$), indicating that exchange rate depreciation is associated with increased inflation in Nigeria. A 1% depreciation of the exchange rate is linked to a 0.2089% increase in the inflation rate, aligning with the a priori expectation of a positive relationship.

ARDL Error Correction Regression (Short-Run Dynamics)

The short-run dynamics of the relationship between the inflation rate and the independent variables were examined using the error correction representation of the ARDL model. This analysis helps to understand how quickly the system adjusts to deviations from the long-run equilibrium. Table 4.10 presents the estimated coefficients, standard errors, t-statistics, and p-values for the short-run variables, along with key model statistics.

Table 11. ECM Regression for Short-Run Relationship

Variable	Coefficient	Standard Error	*t*-Statistic	*p*
C	-54.75296	9.159346	-5.977825	0.0000
D (MPR)	-0.109614	0.581295	-0.188568	0.8523
D (MPR (-1))	-4.989215	0.909705	-5.484432	0.0000

D (MPR (-2))	-1.673697	0.802881	-2.084615	0.0501
D(CRR)	0.572279	0.691191	0.827961	0.4175
D (CRR (-1))	3.312020	0.798388	4.148382	0.0005
D (CRR (-2))	1.338568	0.798899	1.675517	0.1094
D (CRR (-3))	0.970996	0.637136	1.524001	0.1432
D (ERT)	0.065616	0.022133	2.964687	0.0077
D (ERT (-1))	0.149974	0.073783	2.032646	0.0556
CointEq (-1) *	-0.796308	0.137941	-5.772809	0.0000

Table 12. Model Statistics

Statistic	Value
R-squared	0.731821
Adjusted R-squared	0.615222
F-statistic	6.276376
Prob(*F*-statistic)	0.000137

Note. CointEq(-1) represents the lagged error correction term. * p-value incompatible with t-Bounds distribution.

Source: Eviews Output, 2024

Error Correction Term (CointEq (-1)): The coefficient of the error correction term is negative and statistically significant ($\beta = -0.7963$, $p < .001$). This confirms the existence of a stable long-run relationship among the variables and suggests that approximately 79.63% of any short-term disequilibrium in the inflation model is corrected each year. This relatively fast adjustment speed indicates that shocks affecting the system have a short-lived impact on the inflation rate.

Short-Run Effects of Independent Variables

D (MPR): The current value of the change in the monetary policy rate (D (MPR)) does not have a statistically significant effect on inflation. However, lagged values, D (MPR (-1)) and D (MPR (-2)), have statistically significant negative coefficients, suggesting that increases in the MPR in previous periods can lead to a decrease in the inflation rate in the current period.

D (CRR): The current value of the change in the cash reserve requirement (D (CRR)) is not statistically significant. However, the lagged effect D (CRR (-1)) shows a statistically significant positive relationship with inflation.

D (ERT): Both the current and lagged values of changes in the exchange rate (D (ERT) and

D (ERT (-1)) shows statistically significant positive relationships with inflation in the short run. This suggests that exchange rate depreciation can lead to an immediate increase in the inflation rate.

The short-run dynamics highlight the complex and lagged adjustments that occur in response to monetary policy changes in Nigeria. The significant error correction term indicates a strong tendency for the system to return to

long-run equilibrium after short-term deviations. Answering the Research Question. Test of Hypotheses:

This section presents the results of the hypothesis tests related to the research questions. Each hypothesis was tested using the p-value approach at a significance level of $\alpha = .05$.

Hypothesis one ($H_0$1): There is no significant impact of the Monetary Policy Rate (MPR) on the inflation rate in Nigeria.

The long-run ARDL estimate for MPR (Table 4.9) shows a statistically significant positive coefficient ($\beta = 6.4499$, $p < .001$). Therefore, we reject $H_0$1. The results provide strong evidence to conclude that the MPR has a significant and positive impact on the inflation rate in Nigeria in the long run.

Hypothesis two ($H_0$2): Cash Reserve Requirements (CRR) do not significantly influence the inflation rate in Nigeria.

The long-run ARDL estimate for CRR (Table 4.9) exhibits a statistically significant negative coefficient ($\beta = -3.9362$, $p = .0020$). Consequently, we reject $H_0$2. The findings suggest that the CRR has a significant and negative influence on the inflation rate in the long run in Nigeria. Hypothesis three ($H_0$3): There is no significant impact of the Exchange Rate (EXCH) on the inflation rate in Nigeria. The long-run ARDL estimate for ERT (Table 4.9) demonstrates a statistically significant positive coefficient ($\beta = 0.2089$, $p = .0093$). Therefore, we reject $H_0$3. The findings provide strong evidence to conclude that the exchange rate has a significant and positive impact on the inflation rate in Nigeria in the long run. Specifically, exchange rate depreciation is associated with increased inflation.

CONCLUSIONS AND RECOMMENDATIONS

The findings of this study reveal the complex dynamics of monetary policy effectiveness in achieving economic stabilisation in Nigeria. The unexpected positive relationship between the MPR and inflation highlights potential weaknesses in the monetary policy transmission mechanism, structural rigidities in the economy, and the influence of fiscal dominance. The effectiveness of the CRR in controlling inflation supports the Quantity Theory of Money, emphasising the role of money supply management in achieving price stability. The significant impact of exchange rate depreciation on inflation underscores Nigeria's vulnerability to imported inflation due to its dependence on imports. The study's findings emphasise the need for a comprehensive and coordinated approach to economic stabilisation in Nigeria, considering the interplay of monetary, fiscal, and exchange rate policies.

1. The CBN should enhance the effectiveness of the monetary policy transmission mechanism by addressing structural bottlenecks in the financial sector. This includes promoting financial inclusion, strengthening financial institutions, and improving the efficiency of credit allocation mechanisms.
2. The CBN should carefully calibrate CRR adjustments, considering their potential impact on bank lending and economic growth. Gradual adjustments and clear communication with the banking sector can

mitigate the negative effects on credit availability while achieving the desired inflation-control objectives.

3. The Ministry of Finance should coordinate fiscal policies with monetary policies to avoid conflicting objectives. Reducing fiscal deficits and promoting fiscal discipline can complement the CBN's efforts to control inflation and enhance the effectiveness of monetary policy tools.
4. The government should pursue diversification of the economy to reduce reliance on imports, which would mitigate the inflationary impact of exchange rate depreciation. Promoting non-oil exports and developing domestic production capacity for essential goods can reduce the country's vulnerability to imported inflation.

FURTHER STUDY

This research still has limitations so further research on this topic is still needed.

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