SAHEL INTERNATIONAL JOURNAL OF
ECONOMIC AND DEVELOPMENT STUDIES
Volume 1 | Issue 2 | July–December 2026
ISSN: 0189-1774

MONETARY POLICY RATE AND INFLATION DYNAMICS IN NIGERIA: REACTIVE POLICY OR COST CHANNEL UNDER INFLATION UNCERTAINTY?

Clement Andrew Ijighere[1] and Salma Onyosuza Ayitogo[2]
[1]clementandrew98@gmail.com | [2]Salma.onyoon@fulafia.edu.ng
[1,2] Department of Economics, Federal University of Lafia, Nasarawa, Nigeria
DOI: 10.64290/SIJEDS.v1i2.4

Abstract

The year 2024 saw Nigeria's MPR reach its highest level in history at 27.50% and inflation peak at 34.8%. This study examines the MPR's ability to control inflation over a period of time from 1986 to 2025. Johansen cointegration tests and a GARCH-M(1,1) model with macroeconomic control variables were used; the unadjusted Johansen statistics indicate one cointegrating relation, although this result is not robust to a small-sample correction. The results show that a one percentage point higher MPR is associated with inflation that is about 0.43 percentage points higher. Because this contemporaneous coefficient is an association, it may reflect a policy response to inflation, a cost-channel effect of higher borrowing costs on prices, or common shocks, and the study does not identify which mechanism dominates. The cash reserve ratio is positively, and the liquidity ratio negatively, associated with inflation. Re-estimated with the standard GARCH(1,1) admissibility restrictions imposed, the in-mean estimate points to a positive link between inflation uncertainty and inflation, but it is treated as tentative because the volatility parameters lie on the boundary of the admissible region. Based on these results, it can be concluded that although the MPR is significantly associated with inflation, the interest-rate channel appears to be much weaker than either fiscal or supply-side considerations. Therefore, the study recommends forward-looking rate setting, greater coordination between fiscal and monetary policy makers, and more effective supply-side policies.

Keywords: *Monetary policy rate; inflation; GARCH-M; prices; cost channel; Nigeria*
JEL Classification: *E52; E31; E43; E58; C22*

1. INTRODUCTION

The Central Bank of Nigeria's (CBN) most important mandate is to maintain price stability. To achieve this goal, the CBN has used the Monetary Policy Rate (MPR) as its primary tool for signaling its policy stance since replacing the Minimum Rediscount Rate in December 2006. In accordance with conventional New Keynesian thinking, if the CBN raises the MPR, then the cost of borrowing increases, which reduces aggregate demand and stabilizes expectations. As a result of these actions, inflation should decrease after some period of time (Taylor, 1993; Mishkin, 1995). However, recent events in Nigeria suggest otherwise. Between 2022 and November 2024, the MPR was consistently increased until it reached an all-time high of 27.50%. Simultaneously, the cash reserve requirement for deposit money banks was raised to 50% (CBN, 2024). Despite these increases, headline inflation continued to increase and reached 34.8% by December 2024, the highest rate seen in almost three decades. Only after the Consumer Price Index was rebased to 2024 did headline inflation begin to decline (National Bureau of Statistics [NBS], 2025).

A larger question exists about whether a policy rate can restrain prices in an economy experiencing both record high policy rates and near-record high inflation, such as Nigeria. This question has broader implications for other economies with similar circumstances. Inflation in Nigeria is being driven primarily by currency depreciation, the cost of imported food, the elimination of energy subsidies, and the monetary

 ISSN: 0189-1774 | DOI: 10.64290/SIJEDS.v1i2.4

financing of government budget deficits. During 2024 alone, the naira depreciated approximately 40.9% relative to the U.S. dollar, and imported food inflation was at 29.8% as of March 2024. Additionally, before the central bank overdrafts to the federal government were converted into securities, they amounted to more than ₦23 trillion (CBN, 2024; NBS, 2024). Therefore, cost-push pressures on the economy will likely outweigh the effect of the interest rate channel. A higher policy rate will also likely raise the cost of financing for businesses and directly impact prices. This process is referred to as the cost channel of monetary transmission in the literature (Barth & Ramey, 2001; Ravenna & Walsh, 2006).

Nigerian empirical evidence does not provide a single view regarding this issue. On the other hand, there are some studies which show that the policy rate has had a long-term disinflationary impact in Nigeria (Adekunle, 2023; Adeyemi & Okoro, 2025). On the other hand, there are other studies which indicate that the policy rate has had little or no impact on inflation, or that its impact was delayed and/or statistically insignificant (Adebiyi & Babajide, 2019; Okonkwo, 2020; Nadani & Isah, 2024; Ibrahim & Salisu, 2025). Similarly, cross-country research concerning low-income countries indicates that the transmission mechanism is likely to be weak due to the presence of shallow financial markets and limited competition among banks (Mishra et al., 2012; Mishra & Montiel, 2013). The discrepancy between the various studies is indicative of the fact that the estimated effects of the policy rate will depend upon how inflation dynamics are modeled, as well as upon the time frame within which these dynamics are examined.

A review of the current literature suggests there are three main reasons why the author decided to do this research. First, there is an interpretation gap. Many authors use the finding of a non-negative MPR (or insignificant MPR) as proof that monetary policy did not work. However, there are multiple interpretations for such results. One possible explanation for why we see a central bank raise interest rates during periods of high inflation in low-frequency data is due to what is referred to as the "price puzzle" (Sims, 1992; Christiano et al., 1999). Another explanation is that when the central bank tightens its policy, it increases the cost of producing goods/services through the "cost channel," thus causing prices to rise. While many Nigerian studies have not attempted to differentiate between the various possible reasons for the MPR being positive/insignificant (i.e., reactive policy, cost channel, policy failure), the implications for policymaking are significantly different for each.

The second gap is methodological. For most part, studies of MPR-inflation relationships in Nigeria use a conditional mean of inflation as their dependent variable while assuming a constant variance. This assumption is hard to support. Nigeria experiences both relatively calm periods of inflation and very volatile ones. It also has a large body of literature that says that inflation uncertainty itself may cause higher rates of inflation (Friedman, 1977; Cukierman and Meltzer, 1986). By ignoring the effects of this variability on the error term, researchers are creating uncertainty about whether they have accurately measured the policy effect. The third gap is temporal. Many of the studies reviewed had data ending prior to 2023, thus missing the period of exchange rate unification, fuel subsidy removal and significant monetary tightening that took place from 2023 through 2025. This was a time when the effectiveness of the policy rate was being challenged the most. As such, there is still very little empirical evidence available regarding the most intense monetary tightening cycle in Nigerian history.

This study aims to investigate the impact of the Monetary Policy Rate (MPR) on inflation in Nigeria during the years 1986-2025, using the null hypothesis that there is no relationship between MPR and inflation. There are several contributions made by this study, which address the issues identified in previous sections. One contribution is that this study used the GARCH-in-mean framework to analyze the relationship between MPR and inflation. This framework allowed for both an evaluation of the effects of monetary policy on inflation, as well as an assessment of how inflation uncertainty affects the amount of inflation experienced. Another contribution is that this study included data through 2025. This provided a more complete picture of the current tightening cycle. Finally, this study interpreted the direction of the estimated coefficient in relation to different types of transmission mechanisms. Because the estimated coefficient is a contemporaneous association, the study does not claim to separate these mechanisms; instead, it sets out the policy-reaction and cost-channel explanations as competing interpretations and identifies the evidence that would be needed to distinguish between them. The remainder of this study is organized into five main sections. Section 2 will review the literature regarding concepts, theories and empirical evidence related to the topic of this study. Section 3 will describe the data used in this study and

 ISSN: 0189-1774 | DOI: 10.64290/SIJEDS.v1i2.4

the methodology applied. Section 4 will present and discuss the findings from this study. Section 5 will provide policy recommendations based upon the findings from this study.

2. LITERATURE REVIEW

2.1 Conceptual Clarification

In this research, inflation refers to the ongoing increase in the general prices of goods and services, which is determined in Nigeria as the annual percentage change in the consumer price index (CBN, 2024). It can be caused by demand pull, cost push and structural factors. However, in developing countries, inflation is typically due to the collective effects of exchange rate pass-through, fiscal dominance and supply side constraints within the agricultural and energy sectors. On the other hand, the monetary policy rate (MPR) is used as a reference point for the CBN to extend credit to deposit money banks and to create a corridor around which it will lend or deposit funds. Changes in the MPR indicate where policy may go, as well as influencing inter-bank lending rates, lending rates and deposit rates. These changes in turn affect borrowing, investment and consumption choices. A decrease in the MPR encourages economic activity by decreasing the cost of funds; an increase in the MPR reduces credit and helps control inflation.

2.2 Theoretical Review

The traditional theory of how monetary policy affects the economy is based on the Keynesian and New Keynesian views. Holding expected inflation fixed, an increase in the short-term nominal rate raises the real interest rate, which can reduce interest-sensitive spending. A negative output gap would open up, causing inflation to fall (Mishkin, 1995). Taylor (1993) described the policy aspect of the mechanism through a reaction function in which the central bank increases its rate by more than the change in inflation. This has implications for empirical studies of monetary policy. If the monetary authority uses such a rule, it would raise its rate during periods of higher inflation. Therefore, there may be a positive correlation between the policy rate and inflation, although monetary policy is still effective. Sims (1992) found evidence of a "price puzzle" in many developed countries; Christiano, Eichenbaum, and Evans (1999) argued that the puzzle was due to the absence of relevant information that policymakers took into consideration.

The cost channel provides a second reason as to why there is a positive relationship. When firms have to pay for labor and working capital prior to receiving their revenue, an increase in the policy rate will result in an increase in marginal costs and price increases (Barth & Ramey, 2001). Ravenna and Walsh (2006) showed that the presence of the cost channel results in a tradeoff between stabilizing inflation and stabilizing output; there is also evidence from Italian companies showing that changes in interest costs are being reflected in their prices (Gaiotti & Secchi, 2006). It can be expected that the cost channel would be particularly effective in economies with primarily short term bank loans, high collateral requirements, and lending rates that significantly exceed the policy rate.

The Structuralist Theory of Inflation, first introduced by Noyola and Furtado, attribute inflation to supply constraints, unequal distribution of resources among different sectors, and reliance on foreign countries for inputs. Supply constraints include lack of response from the agricultural sector to changes in price; inadequate infrastructure; and high imports of consumer goods and raw materials used in production. Thus, exchange rates and supply shocks are the main drivers of inflation, and monetary policies, such as interest rates, will have little impact on reducing inflation. From a fiscal standpoint, if the central bank monetizes the deficit of the government, then the monetary policy used to reduce inflation can be counterbalanced by monetization, and therefore inflation is ultimately a fiscal problem (Sargent & Wallace, 1981). The theoretical picture is complete with the literature regarding inflation uncertainty. Friedman (1977) and Ball (1992) state that as inflation increases so does uncertainty regarding future inflation. Cukierman and Meltzer (1986) argue that uncertainty provides an opportunity for central banks that do not possess full credibility to use "surprise inflation" as a means to increase the average rate of inflation.

This study was based upon the theoretical framework of the Structuralist Theory of Inflation, along with the reaction-function and cost-channel arguments. The structuralist perspective explains why there are

 ISSN: 0189-1774 | DOI: 10.64290/SIJEDS.v1i2.4

limits to how much the policy rate can affect price levels in Nigeria; the reaction-function and cost-channel arguments describe how both mechanisms can produce a positive relationship between the MPR and inflation; and the literature regarding inflation uncertainty provides a theoretical justification for modeling the variance of inflation in addition to its level.

2.3 Empirical Review

International research suggests monetary transmission is generally less effective in low-income and lower-middle-income countries. Mishra and Montiel (2013) reviewed this research and found no strong evidence for an effective bank lending channel or interest rate channel in low-income economies; while Mishra, Montiel, and Spilimbergo (2012) suggested the lack of effectiveness was due to weak financial market development, a low level of competition in banking, and unstable institutional structures. Ojo and Ogunleye (2021), using data from a panel of Sub-Saharan African countries between 1990 and 2018, reported that the central bank's policy rate and open market operations can affect inflation, however, the degree to which they do so is strongly related to the country's level of financial development and the credibility of its central bank.

A group of studies within the Nigerian literature suggest that the policy rate decreases inflation. Using ARDL and Granger causality techniques on data from 1981-2021, Adekunle (2023) finds significant short-term and long-term effects as well as a dual-directional relationship between interest rates and inflation. Adeyemi and Okoro (2025) find similar results for 1990-2024 and additionally report that the MPR and open market operations have greater efficacy than reserve requirements.

In contrast, there are other studies which report that the policy rate is weak or has no effect. Adebiyi and Babajide (2019) used a Structural VAR model from 1986-2017 to find only a small and delayed reaction of inflation to changes in the policy rate. Okonkwo (2020) used an OLS model from 1986-2018 to show that the MPR was statistically insignificant. Oladipo (2020) found that the MPR did not have any short term disinflationary effects, but did have long term disinflationary effects; however, these effects were only evident when there was exchange rate stability. Nadani and Isah (2024) estimated two separate Structural VAR models (one for policy rate shocks and one for cash reserve ratio shocks) on monthly data from 2006-2023. They reported that both policy instrument shocks (contractionary) reduced output and credit to the private sector. However, they also reported that inflation continued to be primarily positive following each type of shock. This is called a "price puzzle" which is more durable with respect to the MPR model. Ibrahim and Salisu (2025) stated that the interest rate channel is slow and moderate because of structural rigidity. Ahmed and Lawal (2026) applied a DSGE model to indicate that the weak transmission of monetary policy is due to low financial inclusion. Sani and Okafor (2026) employed a Markov-switching model to demonstrate that policy instruments are less effective during high inflation periods when inflation expectations are not anchored.

As well as the monetary policy rate, there has been a considerable amount of research conducted on the non-monetary factors contributing to inflation which may outweigh the impact of the policy rate. For example, Adeniran et al. (2020), Adebayo and Musa (2021) and Usman and Garba (2025) found that the exchange rate pass-through is more effective than conventional monetary instruments. Also, Olayiwola and Akande (2022) and Ojo and Aluko (2023) identified supply constraints, weak institutions, oil price shocks and fiscal indiscipline as some of the key drivers of inflation in Nigeria. Adamu and Oladipo (2026) concluded that without both fiscal discipline and stable exchange rates, monetary policy cannot control inflation. Similarly, studies using monetary aggregates also support the idea that broad money growth leads to inflation and that the effect of broad money growth on inflation is asymmetrical (Akpan & Ikon, 2018; Uche & Ibrahim, 2022; Okeke & Nwankwo, 2025). Therefore, although there is a body of evidence available, the overall picture presented by the studies examined here remains inconclusive for the same reasons outlined in Section 1. These unresolved issues will help guide the empirical approach taken in Section 3.

 ISSN: 0189-1774 | DOI: 10.64290/SIJEDS.v1i2.4

3. METHODOLOGY

3.1 Data and Variables

The research is conducted using annual time-series data on Nigeria from 1986-2025 (40 years). The beginning of the sample period corresponds to the implementation of the Structural Adjustment Program. This program provided for the liberalization of both interest rates and the exchange rate; and for the establishment of market-oriented monetary policy. All data used in this study come from either the Central Bank of Nigeria's Statistical Bulletin or the World Development Indicators database maintained by the World Bank. Table 1 lists each of the variables used in this study along with their predicted sign. The monetary policy rate (MPR) is the main variable of concern in this study. The other variables listed in Table 1 (cash reserve ratio, liquidity ratio, broad money supply, exchange rate and real output) serve as control variables. These control variables are necessary to prevent any possible confounding effects that could arise due to liquidity conditions, monetary aggregate movements, external price changes, or overall economic performance.

The series are constructed as follows. Before 11 December 2006, the CBN's anchor rate was the Minimum Rediscount Rate (MRR). The MPR replaced the MRR on that date and took over its role as the rate at which the CBN lends to deposit money banks and as the midpoint of the standing-facilities corridor. The MPR was introduced at the prevailing MRR level of 10 percent, so the policy-rate series splices the end-of-year MRR for 1986–2005 with the end-of-year MPR for 2006–2025 without any level adjustment. The source series are taken from the CBN Annual Reports and Statistical Bulletin, the World Bank's World Development Indicators, the IMF's International Financial Statistics and NBS reports, supplemented for 2024–2025 by CBN Monetary Policy Committee communiqués; the 2025 values are preliminary. Annual values are formed as follows: INF is the annual percentage change in the CPI as reported by the IMF and the World Bank; MPR, CRR and LIQR are end-of-December policy settings (where dual CRR rates applied, the rate on private-sector deposits is used); broad money (M2) is the end-of-December stock in ₦ billion, entered in natural logarithms (LM2); EXR is the annual average official exchange rate (₦ per US$); and real output (RGDP) is real GDP at constant 2010 basic prices in ₦ billion, entered in levels rather than logarithms. The label RGDP is therefore used throughout, consistent with Tables 1 and 2. The NBS rebased the CPI during the sample, including to November 2009 = 100 and, in January 2025, to 2024 = 100. Because INF is a percentage change computed within each published base, rebasing does not create a break in the level of the inflation series, and no splicing of CPI levels was required. However, the 2025 observation is computed from the rebased index, whose updated basket and weights lowered measured inflation, so it is not strictly comparable with earlier years; this is acknowledged as a limitation of the study.

Table 1: Description, Measurement and Sources of Variables

Variable	Description and measurement	Expected sign	Source
INF	Inflation rate: annual average percentage change in the CPI (%)	Dependent	CBN
MPR	Monetary Policy Rate (end-of-year, %; Minimum Rediscount Rate before December 2006)	–	CBN
CRR	Cash Reserve Ratio (% of bank deposits held with the CBN)	–	CBN
LIQR	Liquidity Ratio (minimum liquid assets to deposits, %)	–	CBN
LM2	Broad money supply (₦ billion, natural logarithm)	+	CBN
EXR	Official exchange rate (₦ per US$)	+	CBN
RGDP	Real GDP at constant 2010 prices (₦ billion, in levels)	–	CBN

Source: Author's compilation 2026

3.2 Model Specification

In line with the structuralist framework, inflation is expressed as a function of the policy rate and a set of monetary and structural control variables:

 ISSN: 0189-1774 | DOI: 10.64290/SIJEDS.v1i2.4

$$INF_t = f(MPR_t, CRR_t, LIQR_t, LM2_t, EXR_t, RGDP_t) \quad (1)$$

The estimation of the conditional mean and conditional variance will be conducted simultaneously, due to the high degree of volatility clustering in the inflation rate in Nigeria. The GARCH-in-mean model of Engle, Lilien, and Robins (1987) is created when the conditional standard deviation of the inflation rate is included in the mean equation; this is then combined with the GARCH variance process of Bollerslev (1986):

$$INF_t = \beta_0 + \beta_1 MPR_t + \beta_2 CRR_t + \beta_3 LIQR_t + \beta_4 LM2_t + \beta_5 EXR_t + \beta_6 RGDP_t + \theta\sqrt{h_t} + \varepsilon_t \quad (2)$$

$$\varepsilon_t \mid \Omega_{t-1} \sim N(0, h_t) \quad (3)$$

$$h_t = \omega + \alpha\varepsilon^2_{t-1} + \gamma h_{t-1} \quad (4)$$

The first equation (2), the first parameter of interest β1 represents the effect of the policy rate on inflation. A conventional transmission mechanism results in $\beta 1 < 0$. The second parameter θ reflects the effect of uncertainty regarding inflation on the average level of inflation. According to the Cukierman-Meltzer hypothesis, $\theta > 0$. Equation (4), ht is the conditional variance; Ωt-1 is all the information that is known as of time t-1; α is the ARCH parameter which measures how much the volatility responds to shocks in the short-run; and γ is the GARCH parameter which represents how long the volatility persists over time. For the conditional variance to be positive and covariance-stationary, the standard GARCH(1,1) conditions $\omega > 0$, $\alpha \geq 0$, $\gamma \geq 0$ and $\alpha + \gamma < 1$ must hold; the last condition ensures a finite unconditional variance, $\omega/(1 - \alpha - \gamma)$.

3.3 Estimation Procedure

The four-step estimation process begins with the first step, where the Augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1979) is conducted on each series. The selection of the lag length for the ADF test is determined using the Schwarz Information Criterion. This test serves two purposes: to identify the degree of integration for each series and to prevent a spurious regression. In the second step, as all series have been identified as integrated of order one, the Johansen (1988) maximum likelihood method, which uses the trace statistic developed by Johansen and Juselius (1990), is employed to assess whether there is a long-run relationship between the variables. The test is based on a VAR with an unrestricted intercept and no trend (EViews Case 3) and a lag interval of 1 to 1 in first differences, that is, a VAR(2) in levels, which is the most that seven variables and 40 annual observations reasonably allow; the effective sample is 1988–2025 (38 observations). Both the trace and maximum-eigenvalue statistics are reported, and because Johansen tests tend to over-reject in small samples, the trace statistics are also adjusted with the Reinsel and Ahn (1992) small-sample correction. As a check that does not require every series to be I(1), the ARDL bounds test of Pesaran, Shin and Smith (2001) is also applied to the same variables, and the residuals of the estimated mean equation are tested for stationarity. For the third step, the GARCH-M(1,1) model in equations (2)-(4) is estimated by maximum likelihood with the admissibility conditions stated in Section 3.2 imposed in estimation. The use of this estimator over ordinary least squares is justified due to its efficiency in estimating parameters when conditional heteroskedasticity exists, and because it provides a mechanism for directly testing whether inflation uncertainty has an effect on inflation levels (Engle, 1982; Bollerslev, 1986). The fourth step involves assessing the validity of the estimated model. To do so, several diagnostic checks are performed including: evaluating the distribution of the standardized residuals using the Jarque-Bera test for normality; assessing the presence of remaining conditional heteroskedasticity through the ARCH-LM test; and conducting the sign-bias tests of Engle and Ng (1993) to examine if there are asymmetrical responses of volatility to both positive and negative shock events.

 ISSN: 0189-1774 | DOI: 10.64290/SIJEDS.v1i2.4

4. DISCUSSION OF RESULTS

4.1 Descriptive Statistics

Table 2 presents summary statistics. During the sample period, inflation averaged 19.66 percent, with a low of 5.40 percent and a high of 72.84 percent. The highest level of inflation occurred during the inflationary period of the mid-1990s, after structural adjustment. On average, the MPR was 14.45 percent, and it varied from 6.00 percent to its highest point in 2024 at 27.50 percent. The cash reserve ratio showed considerable variability as well, ranging from 2 percent to 50 percent; however, the liquidity ratio stayed fairly constant at approximately 31.5 percent. The exchange rate increased from ₦2.02 to ₦1,445 per US dollar, and broad money expanded from ₦23.6 billion to ₦195,000 billion, representing four decades of currency devaluation and monetary growth. All of the series exhibited positive skewness and leptokurtosis, and the Jarque-Bera test indicated that inflation, the MPR, the cash reserve ratio, the exchange rate, and broad money were not normally distributed. Conditional heteroskedasticity models can be used to model series that exhibit heavy tails and occasional extreme values such as these.

Table 2: Descriptive Statistics Test Result

Statistic	INF	MPR	CRR	LIQR	M2	EXR	RGDP
Mean	19.66	14.45	17.45	31.50	21,879.67	210.41	50,215.45
Median	13.36	13.50	15.00	30.00	3,087.80	128.94	53,580.00
Maximum	72.84	27.50	50.00	40.00	195,000.00	1,445.00	85,445.00
Minimum	5.40	6.00	2.00	25.00	23.60	2.02	17,181.00
Std. Dev.	16.73	4.68	10.16	3.24	41,306.05	308.14	20,602.03
Skewness	1.77	1.18	1.20	0.78	2.89	3.18	−0.07
Kurtosis	5.03	4.92	5.04	3.72	11.28	13.01	1.57
Jarque-Bera	27.70	15.49	16.52	4.89	170.14	234.44	3.42
Probability	0.000	0.000	0.000	0.087	0.000	0.000	0.181
Observations	40	40	40	40	40	40	40

Source: Author's computation using EViews 13.

4.2 Unit Root Test

The ADF results listed in Table 3 show that none of the series are stationary when using the first level data at the 5 percent significance level, but all are stationary when using the first difference. Therefore, each variable is integrated of order one (I(1)) under the trend specification. However, when the ADF regression for inflation includes only an intercept, the level statistic (−3.011) exceeds the 5 percent critical value (−2.939) in absolute value, so inflation is borderline stationary. This is one reason for also using the ARDL bounds test, which is valid whether the variables are I(0) or I(1). This result is in line with variables affected by changing policy regimes, financial deepening, and continuous depreciation and requires a check on whether there is a common long-run trend prior to being able to interpret the relationship between the level of variables.

Table 3: Augmented Dickey-Fuller Unit Root Test Results

Variable	Level t-statistic	5% critical value	First difference t-statistic	5% critical value	Order
INF	−3.402	−3.530	−4.404	−3.548	I(1)
MPR	−2.021	−3.530	−7.331	−3.533	I(1)
CRR	1.939	−2.939	−5.178	−3.533	I(1)
LIQR	−2.290	−3.530	−5.715	−3.537	I(1)
LM2	−2.358	−3.533	−3.816	−3.533	I(1)
EXR	4.703	−3.553	−6.449	−3.533	I(1)
RGDP	−2.226	−3.530	−5.158	−3.533	I(1)

Source: Author's computation using EViews 13.

4.3 Cointegration Test

The Johansen test uses a VAR with an unrestricted intercept and no trend, one lag in first differences (a VAR(2) in levels) and an effective sample of 38 annual observations (1988–2025), with real GDP entered in levels as in the rest of the analysis. In Table 4, the trace statistic rejects the null hypothesis of no cointegrating vector (152.90 against a 5 percent critical value of 125.62) but does not reject the null of at most one (94.63 against 95.75). The maximum-eigenvalue statistics give the same rank: 58.28 exceeds the MacKinnon, Haug and Michelis (1999) 5 percent critical value of 46.23, while 38.57 is below the critical value of 40.08 for the null of at most one. The unadjusted tests therefore indicate one cointegrating vector. This result should, however, be read with caution. With seven variables and only 38 effective observations, Johansen tests tend to over-reject, and when the Reinsel and Ahn (1992) correction is applied, scaling the trace statistic by $(T - pk)/T = (38 - 14)/38$, the statistic for the null of no cointegration falls to 96.57, below the 5 percent critical value. Moreover, a cointegrating rank does not by itself show that the GARCH-in-mean equation is the cointegrating relation, because the rank test does not identify the vector. Two further checks were therefore made. First, the ARDL bounds test of Pesaran, Shin and Smith (2001), applied to the same variables with an ARDL(2, 0, 0, 0, 0, 0, 0) specification selected by the Schwarz criterion, gives an F-statistic of 5.34, above the 1 percent upper bound of 4.43. This supports a level relationship among the variables and is valid whether inflation is I(0) or I(1). Second, an ADF test on the residuals of the estimated GARCH-in-mean mean equation gives a statistic of −4.21, which does not reach the residual-based 10 percent critical value of −5.09 for seven variables (MacKinnon, 2010), so the specific mean equation cannot be confirmed as a cointegrating relation. Accordingly, the mean equation in (2) is not interpreted as an identified long-run equilibrium or an error-correcting relation; its coefficients are read as conditional associations among the levels of the variables, estimated with an explicit model of the inflation variance.

Table 4: Johansen Cointegration Test (Trace Statistic) Result

Hypothesised no. of CE(s)	Eigenvalue	Trace statistic	0.05 critical value	Adjusted trace†
None *	0.7842	152.9025	125.6154	96.57
At most 1	0.6376	94.6274	95.7537	59.76
At most 2	0.4580	56.0546	69.8189	35.40
At most 3	0.3191	32.7811	47.8561	20.70
At most 4	0.2169	18.1747	29.7971	11.48
At most 5	0.1283	8.8819	15.4947	5.61
At most 6	0.0919	3.6634	3.8415	2.31

Source: Author's computation using EViews 13.

4.4 GARCH-M Estimates of the Effect of the Monetary Policy Rate on Inflation

Table 5 presents the maximum likelihood estimates of equations (2) through (4), re-estimated with the admissibility restrictions of Section 3.2 imposed ($\omega > 0$, $\alpha \geq 0$, $\gamma \geq 0$ and $\alpha + \gamma < 1$, implemented as $\alpha + \gamma \leq 0.999$), because the unrestricted estimates ($\alpha = 1.996$, $\gamma = -0.023$) violated these conditions. The estimate for the MPR coefficient is 0.429, and the corresponding z-statistic is 2.03. The associated p-value is 0.042. Therefore, the null hypothesis that there is no statistically significant relationship between the Monetary Policy Rate and the inflation rate in Nigeria was rejected at the five percent significance level. On the other hand, although the coefficient is positive (the opposite of what would be expected), holding the other regressors constant, a one percentage point higher MPR is associated with inflation that is approximately 0.43 percentage points higher. Because the MPR and inflation are measured in the same year, this coefficient is a contemporaneous association rather than an estimate of the causal effect of policy on prices.

The in-mean coefficient (0.411; p = 0.038) is positive and statistically significant, which is consistent with the Cukierman-Meltzer hypothesis that inflation uncertainty raises inflation. Among the control variables, the cash reserve ratio has a statistically significant positive coefficient and the liquidity ratio a statistically

 ISSN: 0189-1774 | DOI: 10.64290/SIJEDS.v1i2.4

significant negative coefficient, while broad money, the exchange rate and real output are not statistically significant once the admissibility restrictions are imposed. In the variance equation, the restrictions bind: the GARCH coefficient is driven to its lower bound (γ = 0) and the ARCH coefficient to its upper bound (α = 0.999). The conditional variance therefore behaves as a highly persistent ARCH(1) process, in which inflation volatility responds strongly to the most recent shock. Estimating an ARCH(1)-M model directly gives the same estimates, so the results do not depend on the GARCH(1,1) form. Because α and γ lie on the boundary of the parameter space, their standard errors are not valid for inference, and with only 40 annual observations the volatility dynamics are weakly identified. The in-mean and MPR estimates should therefore be read as tentative. Two further checks point the same way: in the mean equation estimated by OLS without a variance model, the MPR coefficient is positive but not significant (0.696; p = 0.374), and in the ARDL form used for the bounds test, the long-run MPR coefficient is negative and insignificant (−1.101; p = 0.169). The positive MPR association is thus sensitive to how inflation dynamics are modelled. The model explains approximately 39 percent of the variance in inflation.

Table 5: GARCH-M(1,1) Estimates with Admissibility Restrictions, Dependent Variable: INF

Variable	Coefficient	Std. error	z-statistic	Prob.
Mean equation				
MPR	0.428597	0.210663	2.034511	0.0419
$\sqrt{h_t}$ (GARCH-in-mean)	0.410501	0.197675	2.076644	0.0378
CRR	0.292910	0.123894	2.364196	0.0181
LIQR	−1.288693	0.264503	−4.872139	0.0000
LM2	−0.480554	1.027278	−0.467794	0.6399
EXR	−0.004698	0.007132	−0.658799	0.5100
RGDP	−0.000134	0.000103	−1.299445	0.1938
Constant	54.23300	11.68528	4.641137	0.0000
Variance equation				
ω (constant)	3.316447	2.260255	1.467289	0.1423
α (ε^2_{t-1})	0.999000	0.298397	n.a.	n.a.
γ (h_{t-1})	0.000000	0.028048	n.a.	n.a.
R-squared	0.3869	Adjusted R-squared	0.2528	
Log likelihood	−127.6182	Durbin-Watson	1.2002	

Source: Author's computation using EViews 13.

4.5 Diagnostic Tests

The diagnostic results for the restricted model are shown in Table 6. The Jarque-Bera statistic does not reject normality of the standardized residuals, which supports inference based on the z-statistics for the mean-equation parameters. The ARCH-LM test finds no remaining conditional heteroskedasticity; however, because the variance parameters lie on the boundary of the admissible region (Section 4.4), this should not be taken as evidence that the variance equation is fully specified. No other Engle-Ng sign, negative-size, positive-size or joint bias tests were significant. Consequently, positive and negative inflation shocks equally influence volatility, and there is no need to use an asymmetric model (e.g., TGARCH or EGARCH).

 ISSN: 0189-1774 | DOI: 10.64290/SIJEDS.v1i2.4

Table 6: Post-Estimation Diagnostic Tests

Test	Statistic	Prob.	Decision
Jarque-Bera normality (standardised residuals)	1.9066	0.3855	Residuals normal
ARCH-LM: F-statistic, F(1,37)	0.1281	0.7224	No ARCH effect
ARCH-LM: Obs*R-squared, $\chi^2(1)$	0.1346	0.7137	No ARCH effect
Engle-Ng sign bias (t)	0.1301	0.8972	No bias
Engle-Ng negative-size bias (t)	−0.2942	0.7703	No bias
Engle-Ng positive-size bias (t)	0.3709	0.7128	No bias
Engle-Ng joint bias (χ^2)	0.6492	0.8851	No bias

Source: Author's computation using EViews 13.

4.6 Discussion of Findings

This research shows that the policy rate is significantly associated with inflation in Nigeria, but not in the direction expected under traditional transmission theory. In the past 40 years, and when taking into account other variables (liquidity, money, exchange rates, and output), years with a higher policy rate were also years of higher inflation. At least two mechanisms, as well as common shocks that move both variables, could produce this relationship. The present estimates are consistent with either mechanism but cannot distinguish between them, so both are presented as possible explanations. Because the association is also sensitive to how inflation dynamics are modelled (Section 4.4), these interpretations are offered with caution.

The first possible mechanism is a policy response to inflation. The CBN usually increases the MPR when there has been an increase in inflation, as illustrated by the increase in the MPR after the 2016 recession, and by the 2022-2024 cycle. When evaluating annual data, a central bank that is reactive to inflation will have higher MPRs during high inflation years, therefore, the estimated coefficient may be partly due to the central bank's reaction function to inflation instead of being solely attributable to the causal relationship between monetary policy and prices. This is consistent with the "price puzzle" identified by Sims (1992) for advanced economies and suggests that although a positive relationship exists between the MPR and inflation, it cannot be concluded that increasing the MPR causes inflation. Establishing that reactive tightening is the source of the positive coefficient would, however, require direct evidence, for example from an estimated policy reaction function or from a design that identifies exogenous policy innovations, which is beyond the scope of this study.

A second possible mechanism is the cost channel. Nigerian businesses rely heavily on short-term bank loans to pay for inventory, raw materials from abroad and other operational needs. Since bank loan interest rates are much greater than the central bank's policy rate, an increase in the MPR will lead to increased borrowing costs for these businesses. In a world where competition among businesses is imperfect, those businesses will pass on the higher cost of borrowing to their customers, leading to immediate price increases as a result of a tighter monetary policy (Barth & Ramey, 2001; Ravenna & Walsh, 2006). On the other hand, there is no corresponding increase in demand as a result of the higher cost of borrowing. Private sector borrowing is very low compared to total output; a large percentage of economic activity occurs within the informal cash-based sector; and most inflation is caused by food, energy and imports, all of which are unaffected by changes in the cost of borrowing. The structuralist perspective is particularly relevant here because when there is limited flexibility in supply and inflation is primarily driven by currency devaluations and supply disruptions, increasing the cost of borrowing has little impact on reducing aggregate demand, but increases production costs throughout the economy.

The positive in-mean coefficient, estimated under the admissibility restrictions, adds a credibility dimension to these interpretations, although it remains tentative because the volatility parameters lie on the boundary of the admissible region. In addition to being influenced by a country's monetary policy stance, price stability can also be influenced by how credible that country's monetary policy is; inflation uncertainty can create inflation. When there is uncertainty about the future price level, the exchange rate, and/or the course of monetary policy, businesses and individuals will shorten contract periods, make

more frequent adjustments to prices, hold more foreign currency, and include risk premiums in their pricing decisions. Raising the policy rate after inflation has increased significantly, and the government is still monetizing its deficit, will have very little effect on reducing uncertainty. This finding is consistent with Sani and Okafor (2026), who demonstrated that when expectations are not well-defined, the effectiveness of monetary policy tools decreases, and with the fiscal dominance theory developed by Sargent and Wallace (1981) where raising the policy rate does not lead to credibility in monetary policy if the central bank is funding government deficits. Among the control variables, the positive coefficient on the cash reserve ratio is open to the same two readings as the MPR: the CBN has raised reserve requirements in high-inflation years, most recently in 2024, and higher reserve requirements raise banks' cost of intermediation, which can be passed on through lending rates. The negative coefficient on the liquidity ratio is consistent with tighter liquidity requirements restraining credit-financed spending. Broad money, the exchange rate and real output are not statistically significant in the restricted model.

These findings are consistent with previous research in Nigeria on the weak, delayed, or structurally limited interest-rate transmission channels; specifically, the studies by Adebiyi & Babajide (2019), Oladipo (2020), Ibrahim & Salisu (2025), and Ahmed & Lawal (2026). They are especially consistent with the structural vector autoregressive (VAR) analysis conducted by Nadani & Isah (2024), which demonstrates a prolonged and positive reaction of inflation to central bank policy rate increases over the years 2006 to 2023. These results also support the findings of Mishra, Montiel & Spilimbergo (2012) regarding how low levels of financial system development result in weakened monetary policy transmission. In addition, these results align with the arguments put forth by Ojo & Aluko (2023) and Adamu & Oladipo (2026), stating that achieving price stability through monetary policy alone is impossible without fiscal discipline and international economic stability. On the other hand, these results contradict the findings of Adekunle (2023) and Adeyemi & Okoro (2025), who found that the Monetary Policy Rate (MPR) decreases inflation. This contradiction may be due to differences in the time periods examined and the methodologies used. The current study examined data from 2023 through 2025, which saw both the highest policy rates ever recorded and some of the highest inflation rates ever recorded. Furthermore, this study explicitly modeled inflation uncertainty as separate from policy effects, allowing us to examine whether inflation uncertainty had an impact independent of policy effects. Overall, this means that while the MPR serves as a valid signal for central banks, it is insufficient as a sole means of achieving price stability in Nigeria. The MPR's ability to affect prices is restricted by several factors including the delays inherent in monetary policy implementation, the existence of a robust cost-push channel, and a fiscal/structural environment that consistently creates inflationary pressures.

5. CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to examine the impact of the monetary policy rate (MPR) on inflation in Nigeria from 1986 to 2025 using a GARCH-M (1,1) model which takes into account the effects of inflation uncertainty. It was found that the MPR is positively and significantly associated with inflation; the in-mean estimate, obtained with the GARCH(1,1) admissibility restrictions imposed, points tentatively to a positive link between inflation uncertainty and inflation; the cash reserve ratio is positively and the liquidity ratio negatively associated with inflation; and broad money, the exchange rate and real output are not statistically significant. Because the MPR coefficient is a contemporaneous association, it is consistent with a policy response to inflation, with a cost-channel effect of higher borrowing costs on prices, and with common shocks, and the study does not identify which of these dominates. Under either mechanism, the results suggest that the disinflationary power of the policy rate has been limited by the cost channel, fiscal dominance, and structural supply limitations. Therefore, based on the findings of this study, the following recommendations are made.

In order to achieve this, the Central Bank of Nigeria needs to take a long-term view of how it sets its policy rates. Decisions about interest rates should be based on future inflation expectations, as well as on key economic indicators that provide early warning signs of inflationary pressure, such as exchange rate fluctuations, food security issues and government borrowing needs.

Second, the CBN needs to make sure that people know what to expect from them and their policies through the way they talk about their policies. Because the very fact that people don't know what will

happen next causes prices to rise (inflation), making sure people know how the CBN will behave is just as important as the actual interest rates they set.

Thirdly, the CBN should discontinue funding of the Federal Government's deficit via the monetisation process. The legal maximum amount of Ways and Means advances that can be provided to the Federal Government should be strictly adhered to and deficits should be funded through transparently issuing debt securities to the public

Fourth, the use of monetary policy needs to be combined with structural changes to the economy to address some of the underlying causes of inflation. Structural changes such as increased investment in agricultural productivity, storage facilities and rural infrastructure.

This study has some limitations. First, the positive MPR coefficient cannot by itself separate a policy reaction to inflation from a cost-channel effect; future research should estimate a policy reaction function or identify policy innovations directly. Second, the Johansen evidence of cointegration is sensitive to small-sample correction, and although the bounds test supports a level relationship, the specific mean equation cannot be confirmed as a cointegrating relation. Third, when the GARCH(1,1) admissibility restrictions are imposed, the volatility parameters lie on the boundary of the parameter space, and the positive MPR association is sensitive to how inflation dynamics are modelled; higher-frequency (monthly or quarterly) data would allow the volatility process and the policy effect to be estimated more precisely. Fourth, the 2025 inflation observation is based on the rebased CPI (2024 = 100) and is not strictly comparable with earlier years.

REFERENCES

Adamu, I., & Oladipo, O. (2026). Effects of monetary and fiscal policy on inflation in Nigeria. *African Journal of Macroeconomic Analysis, 14*(1), 101–125.

Adebayo, T. S., & Musa, A. (2021). Exchange rate shocks and inflation in Nigeria. *African Journal of Economic Review, 9*(2), 112–130.

Adebiyi, M. A., & Babajide, A. A. (2019). Monetary policy transmission and inflation in Nigeria. *CBN Journal of Applied Statistics, 10*(1), 75–98.

Adekunle, W. (2023). Monetary policy instruments and inflation in Nigeria. *Nigerian Journal of Economic Research, 15*(1), 21–40.

Adeniran, J. O., Yusuf, S. A., & Adeyemi, O. A. (2020). Exchange rate volatility and inflation dynamics in Nigeria. *Journal of Economic and Financial Studies, 8*(3), 55–70.

Adeyemi, O., & Okoro, P. (2025). Monetary policy instruments and inflation dynamics in Nigeria. *Journal of Monetary and Financial Economics, 13*(2), 60–82.

Ahmed, S., & Lawal, M. (2026). Monetary policy transmission mechanism and inflation in Nigeria. *Journal of Economic Policy Studies, 12*(3), 44–66.

Akpan, E. S., & Ikon, M. A. (2018). Money supply and inflation in Nigeria. *Journal of Economics and Sustainable Development, 9*(4), 45–58.

Ball, L. (1992). Why does high inflation raise inflation uncertainty? *Journal of Monetary Economics, 29*(3), 371–388.

Barth, M. J., & Ramey, V. A. (2001). The cost channel of monetary transmission. *NBER Macroeconomics Annual, 16*, 199–240.

Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics, 31*(3), 307–327.

Central Bank of Nigeria. (2023). *Statistical bulletin*. https://www.cbn.gov.ng

Central Bank of Nigeria. (2024). *Monetary policy communiqué*. https://www.cbn.gov.ng

Christiano, L. J., Eichenbaum, M., & Evans, C. L. (1999). Monetary policy shocks: What have we learned and to what end? In J. B. Taylor & M. Woodford (Eds.), *Handbook of macroeconomics* (Vol. 1A, pp. 65–148). Elsevier.

Cukierman, A., & Meltzer, A. H. (1986). A theory of ambiguity, credibility, and inflation under discretion and asymmetric information. *Econometrica, 54*(5), 1099–1128.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association, 74*(366), 427–431.

Engle, R. F. (1982). Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation. *Econometrica, 50*(4), 987–1007.

Engle, R. F., Lilien, D. M., & Robins, R. P. (1987). Estimating time varying risk premia in the term structure: The ARCH-M model. *Econometrica, 55*(2), 391–407.

Engle, R. F., & Ng, V. K. (1993). Measuring and testing the impact of news on volatility. *The Journal of Finance, 48*(5), 1749–1778.

Friedman, M. (1977). Nobel lecture: Inflation and unemployment. *Journal of Political Economy, 85*(3), 451–472.

Gaiotti, E., & Secchi, A. (2006). Is there a cost channel of monetary policy transmission? An investigation into the pricing behavior of 2,000 firms. *Journal of Money, Credit and Banking, 38*(8), 2013–2037.

Ibrahim, A., & Salisu, M. (2025). Interest rate channel and inflation control in Nigeria. *Journal of Applied Economics and Policy, 10*(2), 48–69.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control, 12*(2–3), 231–254.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics, 52*(2), 169–210.

MacKinnon, J. G. (2010). *Critical values for cointegration tests* (Queen's Economics Department Working Paper No. 1227). Queen's University.

MacKinnon, J. G., Haug, A. A., & Michelis, L. (1999). Numerical distribution functions of likelihood ratio tests for cointegration. *Journal of Applied Econometrics, 14*(5), 563–577.

Mishkin, F. S. (1995). Symposium on the monetary transmission mechanism. *Journal of Economic Perspectives, 9*(4), 3–10.

Mishra, P., & Montiel, P. (2013). How effective is monetary transmission in low-income countries? A survey of the empirical evidence. *Economic Systems, 37*(2), 187–216.

Mishra, P., Montiel, P. J., & Spilimbergo, A. (2012). Monetary transmission in low-income countries: Effectiveness and policy implications. *IMF Economic Review, 60*(2), 270–302.

Nadani, A. A., & Isah, A. (2024). The effectiveness of monetary policy transmission in Nigeria: Evidence from the monetary policy rate and the cash reserve ratio. *CBN Journal of Applied Statistics, 15*(1), 117–151. https://doi.org/10.33429/2476-8472.1259

National Bureau of Statistics. (2024). *Consumer price index report*. https://www.nigerianstat.gov.ng

National Bureau of Statistics. (2025). *Inflation report*. https://www.nigerianstat.gov.ng

Ojo, A., & Aluko, B. (2023). External shocks and inflation dynamics in Nigeria. *African Economic Research Journal, 11*(3), 120–142.

Ojo, M., & Ogunleye, T. (2021). Monetary policy effectiveness in Sub-Saharan Africa. *African Development Review, 33*(2), 210–230.

Okeke, J., & Nwankwo, S. (2025). Money supply growth and inflationary pressures in Nigeria. *Journal of Economic Modelling and Policy, 9*(1), 66–88.

Okonkwo, I. (2020). Monetary policy rate, cash reserve ratio, and liquidity ratio effects on inflation in Nigeria. *Nigerian Journal of Economic Analysis, 8*(2), 25–47.

Oladipo, O. (2020). Interest rate dynamics and inflation in Nigeria. *Journal of Macroeconomic Studies, 6*(1), 14–35.

Olayiwola, K., & Akande, T. (2022). Structural determinants of inflation in Nigeria. *Journal of Development Economics and Policy, 13*(2), 58–79.

 ISSN: 0189-1774 | DOI: 10.64290/SIJEDS.v1i2.4

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289–326.

Ravenna, F., & Walsh, C. E. (2006). Optimal monetary policy with the cost channel. *Journal of Monetary Economics, 53*(2), 199–216.

Reinsel, G. C., & Ahn, S. K. (1992). Vector autoregressive models with unit roots and reduced rank structure: Estimation, likelihood ratio test, and forecasting. *Journal of Time Series Analysis, 13*(4), 353–375.

Sani, A., & Okafor, E. (2026). Inflation expectations and monetary policy effectiveness in Nigeria. *Journal of Economic Dynamics, 15*(2), 102–124.

Sargent, T. J., & Wallace, N. (1981). Some unpleasant monetarist arithmetic. *Federal Reserve Bank of Minneapolis Quarterly Review, 5*(3), 1–17.

Sims, C. A. (1992). Interpreting the macroeconomic time series facts: The effects of monetary policy. *European Economic Review, 36*(5), 975–1000.

Taylor, J. B. (1993). Discretion versus policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy, 39*, 195–214.

Uche, C., & Ibrahim, H. (2022). Money supply growth and inflation in Nigeria. *Journal of Economic Policy and Research, 10*(3), 39–61.

Usman, M., & Garba, A. (2025). Exchange rate pass-through and inflation in Nigeria. *International Journal of Economics and Finance, 12*(4), 70–92.