

## MONETARY POLICY REGIMES AND MACROECONOMIC PERFORMANCE IN NIGERIA

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### Abstract

*The study examines the effectiveness of monetary policy in influencing macroeconomic performance during the monetary targeting and inflation targeting regimes. Money supply and interest rate are the two policy instruments for the two regimes. The study employed autoregressive distributed lag to estimate variables such as gross domestic product, inflation, exchange rate, total government expenditure, public debt, oil price, per capita income, investment, and unemployment. The study uses annual secondary data that is sourced from the central bank of Nigeria statistical bulletin and world development indicator (online version) between 1986 and 2021. Results show that monetary policy is not effective in influencing macroeconomic performance during the monetary targeting regime as an increase in the stock of money is used for the importation of finished goods. However, monetary policy performs better under the inflation-targeting regime with an interest rate as the policy instrument. The study concludes that inflation targeting should be made explicit in the country and therefore, recommended that interest rate should be the nominal anchor in Nigeria.*

*Keywords: Output; ARDL, Monetary Policy; Inflation Targeting*

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### 1 Introduction

The main objective of every macroeconomic management is price stability. Others include improvement in the living standard, provision of employment opportunities, poverty reduction, maintenance of external payments equilibrium, sustainable growth, and economic development. The achievement of these objectives is shown in the

performance of macroeconomic indicators and how they affect the economy. Hence, macroeconomic performance can be defined as how well a country is doing in reaching key objectives of government policy. Although policymakers are charged with the responsibility of controlling the economy and influencing the performance of macroeconomic variables with the use of both fiscal policy and monetary policy,

however, studies have shown that monetary policy has attracted wider attention as regards its impact on the economy and its role in achieving the stabilization objective (Carvalho, 2009; Afonso and Sousa, 2012). Hence, monetary policy has been considered effective not only in stabilizing the economy but also in achieving other macroeconomic objectives.

Monetary policy can be defined to mean the effort of the monetary authority to determine the stock of money in circulation relative to economic activities (Nnanna, 2001). Alternatively, it is seen as an avenue for influencing the amount of money in circulation and other credit facilities to achieve price stability and increase the level of output (CBN, 2011). The Central Bank of Nigeria (CBN) understands the fact that appraising the existing policy framework is important in the pursuit of price stability as this will provide an avenue for responding to changes in the macroeconomic environment. Therefore, for monetary policy to be effective, the operating environment, institutional framework, and the policy instrument employed must be considered. (Nnanna, 2001).

Over the years, Nigeria has experienced changes in its monetary policies, bringing about the adoption of different monetary regimes in an attempt to achieve macroeconomic stability. Hence, monetary policy regimes can be referred to as the constraint or limit caused by the environment, institutions, and nature on the effectiveness of monetary policy in achieving the desired results (Michael and Anna, 1997). These regimes are operated with the use of a specific framework and they achieve their objectives by working through some channels. The common regimes include; exchange rate, monetary targeting, and inflation targeting regimes. The administration of different regimes of monetary policy is a critical aspect of economic management to ensure

macroeconomic stability. There have been incessant changes in the implementation of monetary policy frameworks in Nigeria after the adoption of the Structural Adjustment Programme (SAP). Since the introduction of SAP, price stability has been the focus of monetary authority. Several policy measures in Nigeria have been undertaken to ensure the achievement of macroeconomic objectives for appropriate monetary policy conduct. Monetary targeting was implemented with the use of money supply as a policy instrument. However, with the adoption of this policy measure, evidence still shows that macroeconomic indicators reveal a wide gap between the achieved and the desired results. These shreds of evidence include continuous rise in poverty, low standard of living, relatively high rate of unemployment, and reduction in the revenue generated from oil export from year to year.

The use of inflation targeting was adopted to maintain a low inflation rate within the target band of 8.5 per cent and the conduct of monetary policy using inflation targeting was implicit unlike in other countries where the operation was explicit (Apanisile and Ajilore, 2013). The success of this type of framework depends largely on the federal government which determines the achievement of the targeted inflation rate without making it explicit. Under an inflation targeting regime, the objective is to achieve a low level of inflation that is within the bound thereby stabilizing the macroeconomic environment for better performance. Achieving this objective has been a herculean task in Nigeria thereby making inflation targeting a necessary monetary policy framework in the country (Adegboye, 2005). In the implementation of this framework, the interest rate is the nominal anchor for achieving a low inflation rate objective. Whenever the

inflation rate is above the 8.5 per cent target, the nominal anchor is increased to bring the inflation rate within the bound.

de Mendonça and Nascimento (2020) argued that countries that operate inflation targeting with greater quest for development and that are less prone to political pressure in the absence of international financial crisis, perform better in achieving monetary policy efficiency and macroeconomic stability. In addition, Ezama (2009) indicated that the effectiveness of monetary policy results wholly from the commitment of the monetary authorities to effectively control the economy. Furthermore, Morander and Schmidt (2002) reveal that the effectiveness of interest rate as a nominal anchor depends on additional policy instruments such as exchange rate in a bit to achieve the objective of price stability and economic growth. Also, Mishkin (1998) explained that the effectiveness of a monetary policy regime depends on factors such as the history of the country and its quality of institution. Therefore, the effectiveness of monetary policy regimes in enhancing macroeconomic performance depends on several factors. Hence, it is important to consider how nominal anchors of the monetary policy regimes perform in achieving the desired results in Nigeria. To achieve this objective, the study focused on the monetary and inflation-targeting regimes where money supply and interest rates are used as policy instruments. The two regimes are chosen because they are the recent regimes employed in the implementation of monetary policy in the country.

Apart from this introduction, the study is further divided into four sections. Section two presents extant literature on the nexus between monetary policy regimes and macroeconomic performance. In section three, methods of estimation and sources of data are presented. Section four

presents the estimation of results and discussion of findings while section 5 concludes the study.

## 2 Literature Review

Most central banks conduct monetary policy within some sort of regime. These regimes create structures that serve as the basis for making policy decisions. The monetary policy structures, therefore, serve as avenues for disseminating policy decisions to the general public. The foundation of monetary policy theory dated back to the Classical Quantity Theory of Money (Gali, 2008). However, recent theories came to the fore in the 1930s starting with the Keynesian Liquidity Preference Theory, followed by the Monetarist Theory, and subsequently several other theories.

Empirically, studies have been conducted on the effect of monetary policy regimes on macroeconomic performance, yet there are still inconclusive arguments by different authors. This can be a result of different methodologies, time frames, variables, and countries used for the studies. In some countries, monetary targeting has been able to achieve its macroeconomic objectives while in others, a switch is made to inflation targeting with the expectation of better performance. This switch is made because of global changes in monetary management and economic operation in other to achieve their monetary objectives. Monetary and inflation targeting are two basic strategies that allow monetary policy to focus on domestic considerations (Mishkin, 2002). Studies by Bardo and Schwartz (1997), Mishkin (2001), Nnanna (2001), Robert and Roger (2011), Havi and Enu (2014) Aizenman & Hutchison (2010); Carare & Stone (2006); Edwards (2006); Josifidis, Allegret, and Pucar (2011); Lin and Ye (2009); Yamada (2013) Nkang; Olusegun and Odu (2018); Apanisile and

Ajilore (2013) among others support the fact that monetary policy measures carried out during a regime influence economic performance. However, studies by Mutuku and Koech (2014); Ball and Sheridan (2005); Goncalves and Salles (2008); Yifan Hu (2003) have confirmed that there is a limited effect of monetary policy measures on economic performance.

More specifically, Bardo and Schwartz (1997) carried out a historical review of monetary policy regimes and economic performance. The study surveyed the historical experience of both domestic and international aspects of monetary policy regimes in the United States. The empirical and theoretical findings in the literature propose that sustainable long-term growth is related to lower price levels. The study first surveyed the experience of four broad international monetary policy regimes: the classical gold standard, the gold standard, the post-Bretton Wood period, and the managed float period. The study then presented a detailed institutional arrangement and policy actions of Federal Reserves in the United States as an important example of a domestic policy regime. Evidence has shown that the efficacy of monetary policy leading to economic growth occurred after the post-war experience of global depression. Therefore, the lessons from this experience have enlightened monetary authorities to reemphasize low inflation as the main focus. Taylor (1999) investigated the determinants of changes in monetary policy regimes in the United States and examined the effects of monetary policy actions on the economy. The study discovered that the timing and political aspects of the economy are the major determinants of changes in policy regimes. In addition, previous monetary policy changes and past errors committed are important for the implementation of monetary policy due to

the evidential facts the information provides.

Rudebuschy and Svensson (2000) analyzed the performance of monetary and inflation-targeting frameworks in the USA. The study excluded the year 1990 due to the instability of money demand during the year. The exclusion resulted in an estimation of a well-behaved money demand function with less shock and controllable demand for money. Results showed that the monetary targeting regime is plagued with increasing inflation and output shock. Furthermore, it was confirmed that monetary targeting was inefficient in the US economy due to high inflation and output gap variability. Furthermore, the results of the analysis conducted on the effect of inflation targeting on macroeconomic indicators by Honda (2002) in New Zealand, Canada, and the UK, using unrestricted VAR and Chow tests, show that inflation targeting did not influence macroeconomic performance in the period under study. Also, the study of Bernanke and Mihov (1998) confirmed the presence of structural change using the Chow test and VAR model in determining the effect of inflation targeting on macroeconomic performance. However, a study of the effect of developing an inflation target on expected inflation conducted using eleven developed countries by Johnson (2002) revealed that post inflation target period is attributed to a large reduction in expected inflation. These results showed that adopting an inflation-targeting framework resulted in sustainable growth.

Mishkin (2001) examined the experience with different monetary policy regimes that are currently in use in several countries to explain how monetary policy is conducted in order to achieve the price stability goal and illustrated the advantages and disadvantages of the regimes. He said that though monetary targeting is not been

practised by most developed countries currently, it has been very successful in countries like Switzerland and especially Germany compared to countries like Canada, the United Kingdom, and the United States. The reason for the success is because of some particular features in those countries. The author also examined changes in monetary policy in the industrialized countries by evaluating and providing case studies of monetary and inflation targeting. He then concludes that the key to the success of inflation targeting is to ensure communication to the public and transparency that will promote accountability. Also, he mentioned that the central features of monetary regimes are the use of a nominal anchor in order to limit political pressures to pursue expansionary, time-inconsistent, monetary policies. He concluded that inflation targeting is likely to improve economic performance in countries where independent domestic monetary policy is operated than monetary targeting.

Amato and Gerlach (2002) studied the effect of inflation targeting in emerging economies. The study reached two conclusions; first, the introduction of an inflation-targeting framework significantly affects the workings of the economies of emerging countries. Second, the financial structure of the market economies favours the exchange rate framework over inflation targeting. This is because during the period of disinflation, the nominal anchor of inflation targeting works with the exchange rate and when conflict arises, a low inflation objective is announced as the primary objective of monetary policy. Yifan Hu (2003) examined factors determining the adoption of the inflation-targeting framework and the effects of inflation-targeting on output using 66 countries between 1980 and 2000. Findings revealed that factors such as economic conditions, structure and quality of institutions of the

countries determine the choice of inflation targeting. In addition, it was discovered that inflation targeting is important for inflation and output performance. The study concluded that a direct relationship exists between inflation and output variability and this contradicts the view of Taylor's Curve. Choi et al (2003) employed the Markov switching model in examining the macroeconomic effects of the inflation targeting framework in New Zealand between 1982 and 1996 using quarterly data and estimated an AR(2) model. The choice of AR (2) is informed by AIC and SIC criteria. The study confirmed the presence of structural break and that the date was at par with the period of policy change. The study concluded that the inflation targeting framework significantly reduced inflation in the country in the period under study.

Minella et al. (2003) have argued that inflation targeting in emerging market economies is a more challenging task than in developed economies. This is because the conduct of monetary policy has to build credibility and reduce inflation rate levels, and simultaneously deal with a greater vulnerability to shocks. In another point of view, several authors, including Calvo (2001) and Mishkin (2004) have pointed to the specific difficulties that emerging market economies may face in conducting inflation targeting. Firstly, credibility issues may weaken the approach of optimal macroeconomic policy in these countries and may reduce the effectiveness of monetary policy. Second, weak institutions may lead to currency substitution or fiscal dominance, thereby reducing the capacity of monetary authorities to target a particular inflation rate, and thirdly, large exchange rates and other external impulses affect the conduct of monetary policy.

Ball and Sheridan (2005) present an analysis of the impact of inflation targeting on the economic performance for twenty members of the Organization for Economic

Cooperation and Development (OECD). They have discovered that the analysis of inflation-targeting countries will lead to a conclusion that their economic performance has improved between the period before targeting and the targeting period as a result of stability in inflation and output growth. However, some countries that have not adopted inflation targeting also experienced improvements around the same time. This implies that better macroeconomic performance is attributed to something other than inflation targeting. Evidence from the several literatures reviewed in this study shows that there are still inconclusive opinions about the impact of inflation targeting on economic performance in industrialized countries. Hence, there is no final word on the remarkable advantage of inflation targeting in this context.

Owoye and Onafowora (2007) examined M2 money targeting, the stability of real M2 money demand, and the effects of deviations of actual real M2 growth rates from targets on real GDP growth and inflation rate in Nigeria since the introduction of the Structural Adjustment Program (SAP) in 1986. The study employed co-integration vector error correction methodology using quarterly data from 1986 to 2001. The empirical analysis showed that the CBN was not strongly committed to its annual M2 money growth targets, but more importantly, the deviations from M2 target growth rates impacted the real GDP growth rate and inflation rate adversely during the period.

Elbourne (2008) investigated the role of housing prices on transmission channels in the United Kingdom. The study estimated eight variables SVAR model and the result showed that housing prices do not play a significant role in the transmissions channel of monetary policy in England. The outcome of this result is that credit and wealth channels do not account for a significant change in output as a result of

monetary policy innovation in the UK. While in Japan, Morsink and Bayoumi (2001) found both monetary policy through bank lending plays a significant role in transmitting monetary impulses to economic activities.

Gonçalves and Salles (2008) have replicated Ball and Sheridan's (2005) analysis by using data from 36 developing economies that have implemented the inflation targeting framework. Their results suggest that the choice of the inflation targeting regime proved beneficial for emerging economies, greater fall in inflation experienced by emerging countries can, to some extent, be attributed to the regime itself and not only to mean reversion and finally, those countries that have adopted inflation targeting have achieved a greater reduction in growth than those going for alternative monetary policy strategy. Moreover, the opinion that inflation-targeting regimes hinder economic growth is not factually based on empirical evidence. In summary, the study proposed that the adoption of inflation targeting by emerging countries contributes to the attainment of better results in terms of macroeconomic performance.

Naraidoo and Guptab (2009) examined the monetary policy modelling in South Africa by using a simple empirical nonlinear framework between 1983 and 2007. The authors found out that modelling the inflation learning rule into its future policy plans gives a better understanding of the actions of the South Africa Reserve Bank (SARB). The results further revealed that the implementation of inflation-targeting monetary policy brought about drastic changes in the country's policy conduct and that the farther away the inflation rate is from its target, the more its response became unattainable. Furthermore, monetary policy conduct in the subsequent years after 2000 is asymmetric because of differences between

the target and actual rate recorded. And lastly, policymakers in the post-2000 were trying on keeping inflation slightly above the target band of 4.5 to 6.9 per cent rather than 3 to 6 per cent.

Kamal (2010) investigates the monetary policy performance in Brazil, Chile and South Africa under inflation targeting framework using the unrestricted Vector Auto-regression (VAR) and Structural Vector Auto-regression (SVAR) approaches depending on quarterly data between 1970 to 2007. The result indicates an improvement in main macroeconomic indicators after the adoption of inflation targeting compared to the pre-adoption period. The result shows a structural change in the three economies of interest due to the adoption of an inflation-targeting regime. This implies that the adoption of an inflation-targeting regime is appropriate towards achieving economic stability and strengthening the ability of those economies to overcome external shocks. However, those countries are still affected by exchange rate fluctuations. Therefore, further steps have to be taken in order to protect countries that are developing their foreign exchange markets and their international reserves.

Gerlach and Tillmann (2011) analyzed the effect of inflation targeting on inflation persistence in Asia Pacific. Quarterly data from 1985 to 2010 was used from the International Financial Statistics Database of IMF. The countries that were used for this study are Indonesia, Korea, the Philippines and Thailand. The study also showed estimates for China, Taiwan, Japan, Malaysia and Singapore that gear monetary policy conduct to ensuring price stability without relying on inflation targeting. The study explored the thriving rate of the strategy by examining the dominance of inflation in these countries, as measured by the sum of the coefficients in an autoregressive model for inflation, by using

a median unbiased estimator and bootstrapped confidence bands. The result showed that the implementation of the inflation targeting approach has reduced inflation drastically and that the rate of reduction is not the same among nations. It also noted that countries that do not adopt inflation targeting have no sign of a fall in inflation dominance. Therefore, the use of inflation dominance rather than inflation rate reveals the above-average performance of inflation targeting above other methods.

Amassoma, Nwosa and Olaiya (2011) examined the effect of monetary policy on macroeconomic variables in Nigeria between the periods 1986 to 2009. The study adopted a simplified Ordinary Least Squares technique and also conducted unit root and co-integration tests. The result shows that monetary policy has witnessed the implementation of various policy initiatives and has therefore experienced sustained improvement over the years. Hence, monetary policy had a significant effect on the economy in ensuring that there is maintenance of price instability. The study concluded that for monetary policy to achieve its other macroeconomic objective such as economic growth there is the need to reduce the excessive expenditure of the government and involve the use of fiscal authorities along with monetary policy measures.

Sandica (2012) conducted a study on Characterizing Monetary Regime Switches in Romania. In the study, the behaviour of Romanian's central bank in stating its monetary objectives was analyzed by using the Markov Switching approach. According to the current situation of the economy, the monetary interest rate, modelled as a Taylor rule approach, was adjusted to target some levels for inflation and output. The monetary authority from Romania adopted inflation targeting in 2005 and continued until the end of 2008. As a result of the output gap that occurred during

the period, it is clear that the national bank didn't target the policy function and inflation was the main issue. When the financial crisis came up and the recession was declared the possibility of being in the first regime suddenly increased. Therefore, the switch was not only a result of the inflation rate and output gap but also the exchange rate which the results showed that in both regimes the coefficient of the exchange rate is positive.

Samarina (2012) examined how reforms and characteristics of the financial system affect the likelihood of countries abandoning their strategy of monetary targeting. Apart from financial system features, this study included macroeconomic, fiscal, and institutional factors associated with countries' choices for monetary targeting. The author formulated five hypotheses for financial system characteristics and included six control variables that could be associated with countries' decisions to leave monetary targeting. A panel logit model was estimated on a sample of 35 monetary targeting countries over the period 1975 to 2009. The result showed that more developed countries with lower inflation and larger fiscal deficits are more likely to quit this monetary strategy. However, the financial determinants of abandoning monetary targeting differ between developed and developing countries. He said that when countries are going through financial evolution processes that include financial liberalization, deregulation and development. In these conditions, they will soon experience the increasing instability of money demand that may force them to reconsider their choice of monetary targeting. In conclusion, the findings of this paper are helpful for understanding which financial system characteristics and reforms can affect monetary policy conduct in developed and developing countries and

how these factors may lead to countries' decisions to exit monetary targeting.

Apanisile and Ajilore (2013) examined the Inflation Targeting Monetary Policy stance of Nigeria between 2000 and 2010. The study estimated a monetary reaction function for the Central Bank of Nigeria, using the Taylor policy rule, to underpin the inflation-targeting monetary policy framework in Nigeria. The Engle-Granger approach to co-integration was adopted for the analysis quarterly. The results showed that the adoption of an inflation-targeting framework was done in order to achieve price stability in an economy that is characterized by a continuous rise in inflation for a very long time. The study, therefore, concluded that Nigeria's monetary policy needs the support of fiscal policy for better performance so as to be able to achieve the desired objective of low inflation.

Bassey and Essien (2014) analyzed the basic issues in adopting inflation targeting as a monetary policy framework in Nigeria. Using the descriptive technique of analysis, results showed that as much as the economy tries to reduce the level of inflation, there is still a cost that is directed towards that action. The study, therefore, concluded that inflation targeting is not a cure and may not significantly reduce the real costs of disinflation in Nigeria in terms of a decline in output and an increase in unemployment. The study, therefore, recommended that the success of inflation targeting, if and when adopted, will depend on the availability of executive capacity, quality and timely data and independence of monetary authorities.

Riti and Kamah (2015) carried out a study on Inflation Targeting and Economic Growth in Nigeria. The study examines the success of sustainable growth through inflation targeting in Nigeria using the VAR model. Annual time series data were used

spanning the period of 1981 to 2010. The result shows that interest rate contributes significantly to reducing inflationary pressures in Nigeria which is a reflection of the import-dependent nature of the Nigerian economy. The study recommends that the objective of monetary policy should be made clear thereby improving planning in the private and public sectors. Also, the CBN should critically evaluate policy options before implementing them.

Umar and Dahalan (2017) examined whether the inflation targeting strategy has performed the role of nominal anchor in Ghana. The Generalized Method of Moments (GMM) estimator was used for the analysis. The result shows that before the adoption of the inflation-targeting strategy, the economy was poorly performed. The paper further uses the augmented monetary policy rule to identify the factors that determine the monetary policy instrument in the economy. The result confirms that the Ghanaian monetary economy practices a fully pledged inflation-targeting framework to serve as a nominal anchor immediately after its adoption for monetary policy conduct.

Nyumuah (2018) examined the channels of the monetary transmission mechanism in Ghana to determine their effectiveness from 1990 to 2015. The study used quarterly data by employing Granger causality tests; variance decomposition and impulse response analyses, the empirical findings reveal that the policy rate does not Granger cause any of the variables and none of the variables Granger causes it apart from bank credit to the private sector. The result shows that the money supply channel was discovered to be the strongest in the long run while the exchange rate channel seems the strongest in transmitting monetary impulses in the short run. The investigation covers 26 years and focused on four channels of monetary transmission which are, policy rate or interest rate, money supply, bank

credit to private sector, and exchange rate channels. The interest rate and the bank credit to private sector channels emerge as very weak channels of monetary transmission. The policy implication of this finding is that weak interest rates and bank credit to private sector transmission channels means inflation-targeting monetary policy will be ineffective in achieving macroeconomic stability.

Egea and Hierro (2019) analysed the effectiveness of monetary policy and its transmission channels before and after the 2007 economic crisis in the United States and Eurozone by making use of the VAR model. The authors found out that, in the United States, the monetary policy before and after the crisis has been effective, with emphasis on the risk channel. However, in the Eurozone, monetary policy was effective before the crisis by using the credit channel. But once the crisis started, unconventional monetary policy remained effective only at the beginning of the crisis but later on; the risk channel became the effective transmission mechanism. This study draws two important conclusions in the field of monetary policy: firstly, there is a need to adjust monetary measures during periods of economic depression as a result of loss in intensity of the transmission channels and the temporary reduction of their effectiveness; and secondly, if the aim to have an effective growth, the important measures must be permanent in the form of pure quantitative easing and not transitory in the form of loans to financial institutions. Nkang, Olusegun and Odu (2018) examined the effectiveness of monetary targeting in Nigeria. Co-integration and error correction modelling techniques were used with quarterly data spanning from the first quarter of 1985 till the second quarter of 2018. The empirical results showed that the choice of monetary targeting framework is not misplaced, given the stability of the real money demand function all through the

study period, except during the global financial crisis when monetary policy tools became less effective and were complemented with unconventional measures. The result showed that the Gross Domestic Product (GDP) growth was found to predict changes in monetary aggregates and vice versa. Further evidence suggested that significant deviation of monetary growth from set targets led to higher inflation and lower output growth. The study, therefore, emphasizes the need to implement relevant structural policies alongside the monetary policy efforts of the Bank. In addition, the Central Bank of Nigeria should ensure that monetary expansion beyond rule-prescribed targets is minimized.

Bashir and Sam-Siso (2020) investigated the nexus between monetary policy and macroeconomic performance in Nigeria between 1981 and 2018 using the unit root test with structural breaks and the ARDL technique. Results showed that in the short run, monetary policy stimulates macroeconomic performance by reducing inflation, unemployment rate and exchange rate through naira appreciation. However, the long-run results are mixed. While the money stock stimulates inflation and unemployment rate, it reduces gdp growth in Nigeria within the period under investigation. The study recommends that policies should be implemented to reduce pressure on inflation, exchange rate, and foreign reserves in the country.

Nwobia et. al (2020) investigated the effects of monetary policy on the selected macroeconomic variables in Nigeria between 1981 and 2019 using secondary data, the unit root test, the Johansen cointegration approach, Vector Autoregression, and the Ordinary Least Square approach. The results showed that monetary policy has a positive but statistically insignificant effect on output. However, it has a positive and significant

effect on the inflation rate within the period under investigation. The study recommended that the Central Bank's objective of price stability should be achieved through an inflation-targeting approach as this will assist in achieving inclusive growth that transmits to economic development.

Lawal et. al (2021) explored the effect of exchange rate regimes on macroeconomic variables in Nigeria between 1970 and 2020 using the ARDL technique. The study discovered that fixed and intermediate exchange rates have the capacity of reducing the inflation rate as against the floating exchange rate. In addition, the study did not find a significant relationship between exchange rate regimes and the level of output in Nigeria. more importantly, it was found that the trade balance performed better than other macroeconomic variables considered in the study during the periods of fixed and intermediate regimes in the country.

Adegboyoi et. al (2021) study the effect of government policy on economic growth in Nigeria with emphasis on the fiscal, monetary and trade policies. The study employs secondary data, spanning from 1985 to 2020 and analyzed the data using the ARDL estimation technique. The choice of ARDL is informed by the mixed results of the order of integration. Results showed that interest rate aids economic growth while the amount of money stock retards economic growth in the country within the period under investigation. The study recommends that interest rates should be the nominal anchor for monetary policy in the short-run in the country.

Ajayi and Seth (2023) investigated the effect of monetary policy regimes and price stability in the West African Zone. The study employed secondary data from 2001 to 2021 and panel autoregressive distributed lag to analyse the data. In addition, the study examines which of the policy instrument

(interest rate and money supply) should be the normal anchor in the West African Zone. The result showed that interest rate, as against money supply, is effective in stabilizing prices in the zone. The study recommended that monetary policy should be effective in curbing inflation persistence in the zone and stimulating output in the region.

Based on the review of the extant literature, it can be deduced that several studies have examined the effectiveness of monetary policy in influencing macroeconomic performance during different regimes. However, to the best of our knowledge, no known study has examined the comparative analysis of monetary policy regimes in stimulating macroeconomic performance in Nigeria. Therefore, this study compares the effectiveness of the two monetary policy regimes (monetary and inflation targeting) in spurring the macroeconomic performance in Nigeria between 1986 and 2021. The study used gross domestic product as the only macroeconomic variable.

### 3 Methodology

#### 3.1 Model Specification

The study is anchored on the classical quantity theory of money and Taylor's rule approach. These two frameworks intend to ensure price stability by reducing uncertainty and increasing the credibility of future actions of central banks by manipulating money supply or interest rates to manage the quantity of money in the economy. Based on the theoretical framework above, two empirical models are specified for the study. The first model is used to show the effect of monetary targeting on macroeconomic performance while the second model captures the effect of inflation targeting on macroeconomic performance.

#### Model 1

$$\ln GDP_t = \beta_0 + \beta_1 \ln MS_t + \beta_2 \ln PCI_t + \beta_3 \ln GFCF_t + \beta_4 \ln UEMP_t + \beta_5 \ln EXR_t + \beta_6 \ln TGE_t + \beta_7 \ln PBD_t + \beta_8 \ln OPR_t + u_t \quad (1)$$

#### Model 2

$$\ln INF_t = \beta_0 + \beta_1 \ln INT_t + \beta_2 \ln PCI_t + \beta_3 \ln GFCF_t + \beta_4 \ln UEMP_t + \beta_5 \ln EXR_t + \beta_6 \ln TGE_t + \beta_7 \ln PBD_t + \beta_8 \ln OPR_t + u_t \quad (2)$$

Where GDP = Gross Domestic Product, MS = Money Supply, INT = Interest Rate, INF = Inflation Rate, GFCF = Gross Fixed Capital Formation, UEMP = Unemployment Rate, EXR = Exchange Rate, TGE = Total Government Expenditure, PBD = Public Debt, OPR = Oil Price, PCI = Per Capita Income.

Equations (1) and (2) are estimated using Auto-Regressive Distributed Lag (ARDL), as developed by Pesaran et al (2001). The technique tests both the short-run and the long-run effects of monetary policy regimes investigated on the level of output between 1986 and 2021. This approach is suitable for the estimation of a model with the mixture of I(0) and I(1) variables. It is required that there must not be I(2) variable in the model and that the dependent variable must be I(1). In addition, the Bound test is performed to confirm the existence of long-run relationships among the variables.

The ARDL equation is expressed as:

$$\begin{aligned} \Delta GDP_t = & \beta_0 + \sum_{i=1}^{p_1} \gamma_i \Delta GDP_{t-i} + \sum_{i=0}^{q_1} \omega_i \Delta MS_{t-i} + \sum_{i=0}^{q_2} \delta_i \Delta GFCF_{t-i} + \sum_{i=0}^{q_3} \rho_i \Delta UEMP_{t-i} \\ & + \sum_{i=0}^{q_4} \theta_i \Delta EXR_{t-i} + \sum_{i=0}^{q_5} \sigma_i \Delta TGE_{t-i} + \sum_{i=0}^{q_6} \psi_i \Delta PBD_{t-i} + \sum_{i=0}^{q_7} \lambda_i \Delta OPR_{t-i} \\ & + \sum_{i=0}^{q_8} \theta_i \Delta PCI_{t-i} + \phi_0 GDP_{t-1} + \phi_1 MS_{t-1} + \phi_2 PCI_{t-1} + \phi_3 INV_{t-1} \\ & + \phi_4 UEMP_{t-1} + \phi_5 EXR_{t-1} + \phi_6 TGE_{t-1} + \phi_7 PBD_{t-1} + \phi_8 OPR_{t-1} \\ & + \varepsilon_t \end{aligned} \quad (3)$$

$$\begin{aligned}
 INF_t = & \beta_0 + \sum_{i=1}^{p_1} \gamma_i \Delta INF_{t-i} + \sum_{i=0}^{q_1} \omega_i \Delta INT_{t-i} + \sum_{i=0}^{q_3} \delta_i \Delta GFCF_{t-i} + \sum_{i=0}^{q_4} \rho_i \Delta UEMP_{t-i} \\
 & + \sum_{i=0}^{q_5} \theta_i \Delta EXR_{t-i} + \sum_{i=0}^{q_6} \sigma_i \Delta TGE_{t-i} + \sum_{i=0}^{q_7} \psi_i \Delta PBD_{t-i} + \sum_{i=0}^{q_8} \lambda_i \Delta OPR_{t-i} \\
 & + \sum_{i=0}^{q_9} \vartheta_i \Delta PCI_{t-i} + \varphi_0 INF_{t-1} + \varphi_1 INT_{t-1} + \varphi_2 INV_{t-1} + \varphi_4 UEMP_{t-1} \\
 & + \varphi_5 EXR_{t-1} + \varphi_6 TGE_{t-1} + \varphi_7 PBD_{t-1} + \varphi_8 OPR_{t-1} + \varphi_9 PCI_{t-1} \\
 & + \varepsilon_t
 \end{aligned} \tag{4}$$

If there is evidence of long-run relationship among the variables, the following long-run models are estimated:

$$\ln GDP_t = \varphi_0 \ln GDP_{t-1} + \varphi_1 \ln MS_{t-1} + \varphi_2 PCI_{t-1} + \varphi_3 GFCF_{t-1} + \varphi_4 UEMP_{t-1} + \varphi_5 EXR_{t-1} + \varphi_6 TGE_{t-1} + \varphi_7 PBD_{t-1} + \varphi_8 OPR_{t-1} + \varepsilon_t \tag{5}$$

$$\ln INF_t = \varphi_0 \ln INF_{t-1} + \varphi_1 \ln INT_{t-1} + \varphi_2 PCI_{t-1} + \varphi_3 GFCF_{t-1} + \varphi_4 UEMP_{t-1} + \varphi_5 EXR_{t-1} + \varphi_6 TGE_{t-1} + \varphi_7 PBD_{t-1} + \varphi_8 OPR_{t-1} + \varepsilon_t \tag{6}$$

The ARDL specification of the short-run dynamics can be derived by constructing an error correction model of the form:

$$\begin{aligned}
 \Delta \ln GDP_t = & \beta_0 + \sum_{i=1}^{p_1} \gamma_i \Delta GDP_{t-i} + \sum_{i=0}^{q_1} \omega_i \Delta MS_{t-i} + \sum_{i=0}^{q_3} \delta_i \Delta GFCF_{t-i} + \sum_{i=0}^{q_4} \rho_i \Delta UEMP_{t-i} + \\
 & \sum_{i=0}^{q_5} \theta_i \Delta EXR_{t-i} + \sum_{i=0}^{q_6} \sigma_i \Delta TGE_{t-i} + \sum_{i=0}^{q_7} \psi_i \Delta PBD_{t-i} + \sum_{i=0}^{q_8} \lambda_i \Delta OPR_{t-i} + \\
 & \sum_{i=0}^{q_9} \vartheta_i \Delta PCI_{t-i} + \vartheta ECM_{t-1} + \mu_t
 \end{aligned} \tag{7}$$

$$\begin{aligned}
 \Delta \ln INF_t = & \beta_0 + \sum_{i=1}^{p_1} \gamma_i \Delta INF_{t-i} + \sum_{i=0}^{q_1} \omega_i \Delta INT_{t-i} + \sum_{i=0}^{q_3} \delta_i \Delta GFCF_{t-i} + \sum_{i=0}^{q_4} \rho_i \Delta UEMP_{t-i} \\
 & + \sum_{i=0}^{q_5} \theta_i \Delta EXR_{t-i} + \sum_{i=0}^{q_6} \sigma_i \Delta TGE_{t-i} + \sum_{i=0}^{q_7} \psi_i \Delta PBD_{t-i} + \sum_{i=0}^{q_8} \lambda_i \Delta OPR_{t-i} \\
 & + \sum_{i=0}^{q_9} \vartheta_i \Delta PCI_{t-i} + \vartheta ECM_{t-1} + \mu_t
 \end{aligned} \tag{8}$$

Where  $ECM_t$  is the Error-correcting term and it is defined thus:

$$\begin{aligned}
 ECM_t = & \Delta GDP_t - \beta_0 + \sum_{i=0}^{q_3} \delta_i \Delta GFCF_{t-i} + \sum_{i=0}^{q_4} \rho_i \Delta UEMP_{t-1} + \sum_{i=0}^{q_5} \theta_i \Delta EXR_{t-1} \\
 & + \sum_{i=0}^{q_6} \sigma_i \Delta TGE_{t-1} + \sum_{i=0}^{q_7} \psi_i \Delta PBD_{t-1} + \sum_{i=0}^{q_8} \lambda_i \Delta OPR_{t-1} \\
 & + \sum_{i=0}^{q_9} \vartheta_i \Delta PCI_{t-1}
 \end{aligned} \tag{9}$$

$$\begin{aligned}
 ECM_t = & \Delta INF_t - \beta_0 + \sum_{i=0}^{q_3} \delta_i \Delta GFCF_{t-i} + \sum_{i=0}^{q_4} \rho_i \Delta UEMP_{t-1} + \sum_{i=0}^{q_5} \theta_i \Delta EXR_{t-1} \\
 & + \sum_{i=0}^{q_6} \sigma_i \Delta TGE_{t-1} + \sum_{i=0}^{q_7} \psi_i \Delta PBD_{t-1} + \sum_{i=0}^{q_8} \lambda_i \Delta OPR_{t-1} \\
 & + \sum_{i=0}^{q_9} \vartheta_i \Delta PCI_{t-1}
 \end{aligned} \tag{10}$$

### 3.2 Data Sources and Measurement of Variables.

The study employs annual secondary data, spanning from 1986 to 2021 to achieve the stated objective. Data on variables such as GDP, inflation, money supply, investment, government expenditure, exchange rate, public debt, and oil price are sourced from the Central Bank of Nigeria statistical bulletin (2022). Other variables such as interest rate, employment rate, and per capita income are sourced from World Development Indicator (online version). The level of investment is proxy by gross fixed capital formation and per capita income is income per head. While GDP measures the level of output in the country, money supply and interest rate are the nominal anchors for each of the monetary policy regimes under investigation. All variables are in logarithm form.

### 4 Estimation of Results and Discussion of Findings

We begin our analysis by examining the characteristics of the data set using descriptive statistics. It consists of the measure of central tendency which describes the location of each of the data sets and the measure of variability which describes the distribution of the data. The information provided about the series of data helps to explain the normality of the data set. The result of the descriptive analysis is presented in Table 1. From Table 1, the mean and median values of all the

variables show a high level of consistency as they fall within the minimum and maximum range. This is further buttressed by the nearness of mean and median values of each series because the closer the mean and median of the series, the greater the probability that such series will be normally distributed. Moreover, the series has a relatively low standard deviation which indicates that the variables are relatively stable within the study period. However, GDP, GFCF, and PCI are unstable as their standard deviations are relatively high (9.05, 28.50 and 11.12) compared to other variables.

Furthermore, skewness and kurtosis statistics provide information on the symmetry of probability distributions and how the distributions differ from the normal distribution in terms of their weakness. Results in Table 1 show that GDP, inflation, gross fixed capital formation, total government expenditure, public debt, oil price, and per capita income have kurtosis values that are lower than 3. This signifies a normal distribution. Other variables such as MS, INT, UEMP, EXG and CRE have higher kurtosis values and they are leptokurtic. This implies these distributions are not normal; rather, they are peaked

distributions with more samples above the sample mean. It could also be deduced that inflation, unemployment, and exchange rate are positively skewed while other variables are negatively skewed. A positively skewed distribution implies that the mean and median are greater than the mode and vice versa.

Furthermore, the Jarque-Bera statistic is a goodness-of-fit test that measures the difference between the skewness and kurtosis of the variables with those of the normal distribution. It is usually referred to as the test of normality. At a five per cent level of significance, the Jarque-Bera statistics of each variable accept the null hypothesis of normality. The Table shows that the Jarque-Bera statistic and their respective probabilities show that only MS, INT, UEMP, and EXR are normally distributed variables because their respective probabilities are lower than the critical 5% level of significance. Other variables have a highly statistically significant probability level. Therefore, the null hypothesis of a normal distribution is rejected at a 5% significance level. This rejection of the normality hypothesis is expected of the series in less developed and developing countries where Nigeria belongs.

**Table 1: Descriptive Analysis**

	<b>GDP</b>	<b>MS</b>	<b>INT</b>	<b>INF</b>	<b>GFCF</b>	<b>NUEMP</b>	<b>EXR</b>	<b>TGE</b>	<b>PBD</b>	<b>OPR</b>	<b>PCI</b>
<b>Mean</b>	9.055	2.864	3.409	2.693	28.496	1.437	4.609	6.593	6.866	6.765	11.118
<b>Median</b>	9.335	3.071	3.629	2.503	28.756	1.379	4.529	6.927	7.061	7.443	11.401
<b>Maximum</b>	11.758	4.057	3.916	4.288	30.459	1.946	5.618	8.964	9.455	9.091	13.399
<b>Minimum</b>	5.310	0.281	-0.603	1.683	25.413	1.231	3.915	2.787	3.348	2.093	7.745
<b>Std. Dev.</b>	2.047	0.932	0.769	0.728	1.587	0.188	0.416	1.877	1.806	2.041	1.809
<b>Skewness</b>	-0.365	-1.042	-4.486	0.869	-0.588	1.287	0.982	-0.575	-0.368	-0.729	-0.439
<b>Kurtosis</b>	1.846	3.554	23.911	2.688	2.057	3.575	3.634	2.089	2.170	2.334	1.892
<b>Jarque-Bera</b>	2.565	6.395	711.891	4.285	3.125	9.569	5.855	2.964	1.692	3.531	2.749
<b>Probability</b>	0.27	0.04	0.00	0.11	0.20	0.01	0.05	0.22	0.42	0.17	0.25
<b>Sum</b>	298.798	94.513	112.526	88.862	940.355	47.409	152.095	217.554	226.577	223.244	366.882
<b>Sum Sq. Dev.</b>	134.089	27.782	18.934	16.960	80.57	1.134	5.537	112.676	104.347	133.236	104.813
<b>Observations</b>	36	36	36	36	36	36	36	36	36	36	36

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The next step is to measure the degree of association among the variables in the model. This is required to circumvent the collinearity problem which gives spurious results in a time series regression. To test for correlation, we employed the product moment correlation technique and our result is presented in Table 2. It can be deduced from the result in Table 2 that a strong association exists between GFCF and variables such as TGE, PBD, and PCI. Others include TGE and variables such as PBD, OPR, and PCI. Lastly, there is

evidence of a strong association between PCI and two other variables: PBD and OPR. This implies that all these independent variables must not be included in a single model to avoid spurious results. Another approach to resolve this problem is by using a dynamic model. By dynamic model, we mean that the lagged value of the dependent variable must be included as one of the independent variables. The study used the second approach to resolve the strong association noticed among the independent variables.

**Table 2: Correlation Table**

	MS	INT	INF	GFCF	UEMP	EXG	TGE	PBD	OPR	PCI
MS	1									
INT	-0.193	1								
INF	0.171	-0.784	1							
GFCF	-0.425	0.425	-0.416	1						
UEMP	-0.405	0.022	-0.046	0.257	1					
EXG	-0.387	0.104	-0.123	-0.067	0.106	1				
TGE	-0.437	0.413	-0.389	0.945	0.308	-0.073	1			
PBD	-0.488	0.354	-0.306	0.917	0.467	-0.035	0.961	1		
OPR	-0.231	0.338	-0.438	0.788	-0.121	-0.134	0.794	0.639	1	
PCI	-0.452	0.404	-0.384	0.967	0.323	-0.056	0.991	0.969	0.788	1

**Source: Authors' Computation (2021)**

Another preliminary test that must be carried out is the unit root test. This is because non-stationarity is one of the properties of time series data. The non-stationarity implies that the mean and the variance of each variable are not constant over the years. Failure to test and correct for this property will affect the choice of the estimation technique to use and also affect the outcome of the analysis. To test for the existence of non-stationarity properties of

the variables used, we employ Augmented Dickey-Fuller (ADF) and Phillip-Perron test (PP) with the trend and intercept to identify the nature of stationarity. Table 3 presents the test results at both levels and the first difference. The results showed that the variables are the combination of levels and the first difference. Variables such as interest rate, investment, exchange rate, total government expenditure, and oil price are stationary at levels while other variables

are stationary at first difference. Therefore, the choice of estimation technique should consider this result. Based on this result, we employ autoregressive distributed lag (ARDL) that can estimate models with variables of different orders of integration.

The last preliminary test is to examine the existence of long-run relationships among the variables given that the variables are of different orders of integration. The focus here is to be able to establish the nature of the relationship between monetary policy regimes considered in this study and macroeconomic performance. The long-run

relationship is tested for the models representing the two regimes. We employ a bound testing approach that is associated with ARDL. The long-run relationship is said to exist among variables if they are cointegrated. This is obtained when F-statistic is greater than the upper bound value of the critical value at various levels of significance (Pesaran et al., 2001). If otherwise, the test is inconclusive or has no long-run relationship. The bound testing results in Tables 4 and 5 show that the F-statistics of model 1 and model 2 respectively are above the upper critical bound at a 5% level of significance. Hence it is concluded that the variables are cointegrated.

**Table 3: Unit Root Test Result**

Variables	Augmented Dickey-Fuller			Phillip-Perron		
	Levels	1st Diff	Remark	Levels	1st Diff	Remark
<b>GDP</b>	-3.720	-2.995**	I(1)	-3.306	-2.967**	I(1)
<b>MS</b>	-4.289	-9.369*	I(1)	-4.393	-13.871*	I(1)
<b>INT</b>	-4.969*		I(0)	-4.771		I(0)
<b>INF</b>	-4.358	-8.1681*	I(1)	-4.353	-10.687*	I(1)
<b>GFCF</b>	-3.208**		I(0)	-3.309**		I(0)
<b>UEMP</b>	-3.075	-5.389758*	I(1)	-1.514	-5.434631*	I(1)
<b>EXR</b>	-3.307**		I(0)	-3.639**		I(0)
<b>TGE</b>	-3.064**		I(0)	-4.289*		I(0)
<b>PBD</b>	-2.405	-3.463***	I(1)	-2.204	-4.078026*	I(1)
<b>OPR</b>	-2.855***		I(0)	-5.508*		I(0)
<b>PCI</b>	2.633	-3.912**	I(1)	4.902	-4.158**	I(1)

Notes: \*, \*\*, \*\*\* indicate levels of significance at 1%, 5% and 10% respectively. Unit root was conducted with intercept and no trend.

**Source: Authors' Computation, 2021.**

**Table 4: Bounds Test Results**

<b>Model 1</b>		
<b>Bound Test Result</b>		
F (NGDP, MS, INF, GFCF, UEMP, EXG, TGE, PBD, OPR, PCI)		
K= 9; n=32		F-statistics 3.707
<b>Pesaran et al. Critical Value Bounds</b>		
Significance	I(0)	I(1)
10%	1.88	2.99
5%	2.14	3.30
1%	2.65	2.97

**Table 5: Bounds Test Results**

<b>Model 2</b>		
<b>Bound Test Result</b>		
F (NGDP, INT, INF, GFCF, UEMP, EXG, TGE, PBD, OPR, PCI)		
K= 9; n=32		F-statistics 3.626
<b>Pesaran et al. Critical Value Bounds</b>		
Significance	I(0)	I(1)
10%	1.88	2.99
5%	2.14	3.3
1%	2.65	3.97

Based on the existence of a long-run relationship among the variables and the mixture of an order of integration, the Autoregressive Distributed Lag (ARDL) estimation technique was used to determine the long-run and short-run effects of monetary policy instruments used in each regime on macroeconomic performance in Nigeria. Table 6 shows the estimated ARDL

models of macroeconomic performance and the various explanatory variables. Model 1 represents monetary targeting regime where money stock is the policy instrument. Model 2 represents an inflation-targeting regime where the interest rate is the policy instrument. Macroeconomic performance is proxied by GDP and is the dependent variable for the two models.

In Table 6, model 1 results show that there is no significant relationship between money supply and output level in Nigeria both in the short run and long run. It also shows that money supply has a negative effect on output. This implies that a 1% increase in money supply will reduce the level of output by 0.008% in the long run and 0.006% in the short run. The result confirms the fact that the Nigerian economy is import dependent. An increase in the stock of money does not influence the level of output as such an increase does not facilitate economic activities; rather, it is used for the importation of finished products. Therefore, during the regime, monetary policy is not effective in achieving the desired result of economic growth. This result supports the arguments by Mutuku and Koech (2014), Ball and Sheridan (2005), Goncalves and Salles (2008), and Yifan Hu (2003) that monetary policy under monetary targeting regime has a limited effect on economic performance. However, it must be noted that the result is not statistically significant at a 5% level of significance.

Other variables in model 1 such as investment, exchange rate, and total government expenditure have negative and statistically significant effects on output both in the short run and long run periods. However, public debt and per capita income have positive and statistically significant effects on output both in the short run and long run periods. The error correction term is negative and statistically significant as expected. The coefficient of error term (-0.6), which measures the speed of adjustment, shows that it will take 6 years for the deviation from the long run to be corrected.

Model 2 in Table 6 shows the result of the effectiveness of monetary policy in influencing macroeconomic performance under the inflation targeting regime. In this

regime, the interest rate is the policy instrument. Theoretically, an inverse relationship is expected between interest rate and the level of output. Results from Table 6 shows that interest rate has a negative effect on GDP during the inflation targeting regime both in the long run and short run. A decrease in interest rate will increase GDP by 0.01% in the long run and 0.007% in the short run respectively. This result is supported by Manu and Sulaiman (2018), Fasanya et al (2013), and Oluckuku and Okene (2010). In view of this, monetary policy is effective under the inflation-targeting regime as reflected in this finding. Ufoeze et al (2018) also led credence to this finding by concluding that whenever the money demand function is unstable in the economy, the interest rate is generally a preferred target. However, it is worthy of note that interest rate is not statistically significant as its probability value is above 5%. This confirms the submission of Morander and Schmidt (2002) and Mishkin (1998). Morander and Schmidt (2002) reveal that the effectiveness of inflation targeting depends on the adoption of supportive monetary policy instruments such as floating exchange rates that will lend credibility to the target instrument to achieve price stability. Also, Mishkin (1998) explained that whether a monetary policy regime will work best in a country depends on its political, cultural and economic institutions and also its past history. Therefore, the effectiveness of monetary policy regimes in enhancing macroeconomic performance depends on several factors. Similarly, investment, exchange rate, and total government expenditure have negative and significant effects on output, both in the long run and short run periods. However, public debt and per capita income have positive and significant effects on output both in the short run and long run periods respectively.

**Table 6: Estimated ARDL Models**

Variables	Model 1 Coefficient	Model 2 Coefficient
<b>C</b>	-0.813 (0.318)	-0.837(0.349)
<b>MS</b>	-0.008(0.211)	
<b>INF</b>		-0.01(0.349)
<b>INT</b>	0.017(0.189)	0.021(0.131)
<b>GFCF</b>	-0.123*** (0.005)	-0.122** (0.011)
<b>UEMP</b>	-0.008(0.849)	-0.011(0.814)
<b>EXR</b>	-0.116*(0.000)	-0.125*(0.000)
<b>TGE</b>	-0.084** (0.028)	-0.091** (0.027)
<b>PBD</b>	0.074*** (0.004)	0.069** (0.013)
<b>OPR</b>	-0.034(0.138)	-0.035(0.157)
<b>PCI</b>	1.284*(0.000)	1.296*(0.000)
<b>D(MS)</b>	-0.006(0.221)	
<b>D(INF)</b>		-0.007(0.343)
<b>D(INT)</b>	0.012(0.161)	0.013(0.104)
<b>D(GFCF)</b>	-0.085*** (0.008)	-0.0778** (0.017)
<b>D(UEMP)</b>	-0.006(0.849)	-0.0071(0.813)
<b>D(EXR)</b>	-0.080*(0.000)	-0.079*(0.000)
<b>D(TGE)</b>	-0.058** (0.022)	-0.058** (0.023)
<b>D(PBD)</b>	0.051*** (0.004)	0.045** (0.017)
<b>D(OPR)</b>	-0.023(0.156)	-0.0223(0.178)
<b>D(PCI)</b>	0.886*(0.000)	0.828*(0.000)
<b>CointEq(-1)</b>	-0.695*(0.000)	-0.638*(0.000)
DW-Statistics	2.135	2.083
Adjusted R-Squared	0.99	0.99
F-Statistics F(6,33 )	36106.10(0.00)	35061.55(0.00)

Notes \*, \*\* and \*\*\* indicate levels of significance at 1%, 5%, and 10% respectively.

To confirm the robustness check of the ARDL model, a series of diagnostic tests are conducted. Results are presented in Table 7. The diagnostic test outcomes indicate that the model meets all the appropriate requirements of a regression model. This shows that there is no serial correlation in the residuals of the ECM estimated. Also, the test of Heteroskedasticity, with the null hypothesis of homoscedasticity of the residuals, shows that the residuals are homoscedastic in their behaviours as reflected in the corresponding p-value of F-statistic. The stability test is presented in Figures 1 and 2 respectively. It reveals the steadiness of the long-run coefficient in conjunction with the short-run dynamics of the empirical model. This is assessed by CUSUM and CUSUM square tests. The result suggests that the parameters generated for both models in relation to macroeconomic performance are stable as cumulative residual falls inside the critical bounds of a 5% significant level.

## 5 Conclusion

The study investigates the performance of monetary policy under different regimes on selected economic variables in Nigeria. The study considers two regimes: monetary targeting and inflation targeting. The two regimes use money supply and interest rate as policy instruments respectively. Two different models are employed to represent each of the regimes considered in the study. In addition, gross domestic product is used to represent macroeconomic performance. The explanatory variables include total government expenditure, oil price, inflation, exchange rate, per capita income, investment, public debt and unemployment rate. Annual secondary data is employed and data between 1986 and 2021 are sourced from the CBN statistical bulletin and WDI (online source). Autoregressive

Distributed Lag is employed to analyse the data. Results showed that monetary policy is not effective in influencing the level of output during the monetary targeting regime, both in the short run and long run periods. This is because an increase in the stock of money is not used to facilitate production activities rather; it is used for the importation of goods. This, therefore, makes the economy to be import dependent. However, results show that monetary policy during inflation targeting is effective in influencing the level of output. The study concludes that interest rate is a better instrument of monetary policy in achieving the desired objectives. Therefore, inflation targeting should be made explicit in the country. The study recommended that interest rates should be the nominal anchor in Nigeria.

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