E-ISSN : 2549-3280 P-ISSN : 2549-5933
INTEGRATED JOURNAL OF BUSINESS AND ECONOMICS
Email: ijbe.feubb@gmail.com
http://ojs.ijbe-research.com/index.php/IJBE/index

Empirical Analysis of Monetary Policy and Economic Growth in Nigeria (1990-2022)

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Abstract

This study examines the effects of monetary policy on economic growth in Nigeria throughout 1990-2022. The Autoregressive Distributed Lag (ARDL) bound cointegration is employed to analyse both the short-term and long-term dynamics. The research incorporates various monetary policy instruments as variables, namely Broad Money Supply (MS), Interest Rate (INTR), Inflation Rate (INFR), and Exchange Rate (EXR). Additionally, Economic Growth is measured by the Real Gross Domestic Product Growth Rate (RGDP). It utilises published data from the Central Bank of Nigeria (CBN). Results indicate the long-term statistical significance of the money supply (MS), inflation rate (INF), and exchange rate concerning their impact on the Growth Rate of RGDP. In the short run, it was seen that the MS exhibited statistical significance and exerted a positive influence on RGDP. Conversely, both INTR and EXR were statistically significant and were associated with a negative and significant association with RGDP. Consequently, the study suggests implementing monetary policy to cultivate a conducive investment climate. This may be achieved by promoting market-driven interest and currency rates, stimulating domestic investment, and enticing foreign direct investment.

Article Info

- ***Received*** *: 24th November, 2023*
- ***Revised*** *: 2nd February, 2024*
- ***Published*** *: 15th February, 2024*
- ***Pages*** *: 680-697*
- ***DOI*** *: 10.33019/ijbe.v8i1.826*
- ***JEL*** *: E51, E40, F31,*
- ***Keywords*** *: Money Supply, Interest Rate, Exchange Rate*

1. Introduction

Various nations have endeavoured to effectively administer their economies by implementing monetary policies to foster sustained economic growth and development. The correlation between money and economic aggregates was initially articulated by Adams Smith and subsequently endorsed by monetary economists. Due to elucidating the mechanisms via which monetary policy influences macroeconomic objectives such as economic development, price stability, the equilibrium of the balance of payments, and various purposes, monetary authorities are currently responsible for employing monetary policy to stimulate their economies.

Monetary policy has historically been utilised as a crucial instrument in attaining macroeconomic stability, a prerequisite for fostering enduring economic growth and development (Chinedu et al., 2021). According to Magaji, Michael, and Anthony (2018), monetary authorities should establish goals for intermediate variables such as short-term interest rates, the money MS, and the EXR to achieve macroeconomic stability. One intermediate variable under consideration is the exchange rate, which is hypothesised to exert a more substantial impact on the economy owing to its influence on the valuation of the domestic currency, the foreign sector, domestic INFR, macroeconomic credibility, capital flow, and financial stability. Policymakers must thoroughly understand monetary policy's transmission mechanism and its many channels' relative significance in influencing the different sectors of the economy. This comprehension is crucial for guiding monetary policy in the correct direction and with the necessary level of efficacy.

The monetary authorities employ various methods to achieve stability and foster sustained growth in Nigeria (Michael, 2012). The primary goals of macroeconomic policies encompass maintaining a low inflation rate and fostering a sustained high output growth rate. Furthermore, an essential factor in assessing the pace of economic expansion is the maintenance of price stability. Monetary policy has existed in Nigeria since the Central Bank (CBN) Act of 1958 entrusted the responsibility of formulating and implementing monetary policy to the CBN. According to CBN (2006), the responsibility of implementing this policy aligned with the macroeconomic policy objectives of the Nigerian government, which has been entrusted to CBN throughout the entire history of Nigeria. The objectives, as delineated in the various CBN Acts, are commonly described as maintaining both internal and external equilibrium. Over time, monetary policy has been formulated to maintain stability in prices, interest rates, and exchange rates, uphold a favourable position in the balance of payments and foster accelerated RGDP (Nnanna, 2001). The policy framework of Nigeria has undergone modifications over time to adapt to different political systems and global standards.

The economic growth of Nigeria has exhibited a predominantly fluctuating and moderate pattern throughout the years. In 2021, Nigeria's gross domestic product (GDP) per capita stood at a level that represented around 19% of the global average. This figure was derived from the World Bank's data, which reported Nigeria's per capita GDP as USD 2,360 for the same year. In 2021, the Nigerian economy saw modest growth, evidenced by an annual nominal growth rate of 13.92%. Oil and non-oil sectors were the two classifications of the Nigerian economy. Following the reevaluation of its Gross Domestic Product (GDP) by the National Bureau of Statistics in April 2021, an endeavour aimed at

enhancing the precision of economic size and composition representation, Nigeria has emerged as the foremost economy in Africa, surpassing South Africa. The revised GDP estimates indicate that Nigeria's rebased GDP stood at about $448.12 billion in 2019 and $400 billion in 2020. Based on nominal GDP rankings, the economy in question holds the 27th position globally.

Regarding purchasing power parity rankings, it is ranked the 24th largest economy. However, the per capita GDP for the same year amounted to only USD 2,097.7, a figure influenced by the substantial population size. According to the World Development Indicators, Nigeria has the most substantial economy on the African continent (World Bank, 2021). The Nigerian economy experienced significant challenges in 2015 due to external factors, most notably a global decrease in oil prices. The growth rate experienced a significant decline from 6.2% in 2014 to an anticipated 3.0% in 2015. According to the African Economic Outlook (2016), there was a significant increase in inflation from 7.8% to an expected 9%.

The study subject of interest pertains to the influence of a monetary shock on the RGDP of emerging economies such as Nigeria. ARDL modelling techniques examined monetary policy's influence on RGDP in Nigeria. Hence, this study aims to evaluate the effects of monetary policy in Nigeria, focusing on its role in fostering economic growth.

2. Literature Review

Monetary policy refers to the deliberate and systematic measures implemented by the relevant governing body inside a country, as CBN (2006) stated. Monetary policy aims to achieve a favourable interest rate or inflation rate, stabilising prices and adjusting the quantity of money in circulation (Temitope & Magaji, 2023). Chugunov, Pasichnyi, Koroviy, Kaneva, and Nikitishin (2021) assert that policies are commonly employed to influence economic activities. The primary objective was to attain the requisite macroeconomic stability by manipulating key factors such as the money supply, credit flow, credit cost, and availability. To align with the level of productivity, monetary policy seeks to regulate the quantity and purchasing power of money within an economy (Yekeen & Magaji, 2016). Attainment of price stability and prosperity within an economy can be conceptualised as the deliberate management and guidance of monetary policy and credit provisions (Magaji et al., 2015).

Extensive scholarly research has been dedicated to elucidating the methods by which economic development might be attained, as it has been widely acknowledged as a crucial aim of economic policy (Fadare, 2010). Economic growth manifests a nation's capacity to increase its potential GDP or output. The study by Musa, Magaji, Salisu, and Peter (2022) establishes a positive correlation between financial inclusion, monetary policy, and RGDP. Therefore, the economic expansion prospect necessitates the implementation of sound monetary policy complemented by other supportive measures. In addition, economic growth has brought attention to the factors contributing to the disparities in growth rates among states over time. These disparities, in turn, have implications for the government's monetary policy and the levels of taxation and expenditure that ultimately shape growth rates (Adams et al., 2016). According to the African Economic Outlook (2016), economic growth refers to the increased market value of commodities of a country during a specific period. The customary representation is the utilisation of the percentage

measure denoting the expansion rate in real gross domestic product, commonly called real GDP (Magaji & Musa, 2023). Nevertheless, GDP per capita growth rate, commonly called per capita income, holds greater importance.

To provide a theoretical foundation for this study, the Classical Monetary Theory has been selected. Economists who espoused similar concepts as Jean-Baptiste Say, Adam Smith, David Ricardo, Pigou, and other notable figures contributed enormously to advancing the Classical School of Economics—the conventional paradigm endeavours to elucidate the process of financial decision-making and the concepts of saving and investing. The axiom "supply creates its demand" is a fundamental component of the conventional Say's law of markets. Classical economists emphasise the price level and advocate for the most effective strategies to address inflation, asserting that the economy inherently gravitates towards a state of full employment. Classical economists (quantity theory) claim that the price level within an economy is ascertained based on the volume of money in circulation. The theory elucidates the influence of monetary factors on the economy. The analysis could be conducted within the framework of the exchange equation. The equation MV=PY denotes the association among money supply (M), velocity (V), level of price (P) and transactions formulation (Y), often known as the Cambridge Equation, and another formulation based on the Quantity Theory of Money, are two very equivalent approaches utilised to elucidate the determinants of price levels.

In the transactional framework proposed by Fisher and Newcomb, the determination of the monetary value (M) is independent of other factors. Speed at which circulation (V) and quantity of transactions (T) remain unchanged. Hence, the exchange equation can be expressed as MV = PT, thereby facilitating the illustration that the price level is contingent upon the quantity of money in circulation. This analysis is predicated upon variable price (p) and the underlying assumption of complete utilisation of labour resources within the economy. The equation p=F(m) essentially signifies that money supply alterations occur concurrently with price fluctuations. The Cambridge School, in its cash balances version, modified the emphasis of the quantity theory of money. This version is associated with influential economists like Walras, Marshall, Wicksell, and Pigou. Notably, the Cambridge School departed from the basic presuppositions of the Neo-classical school when developing its modified approach. The primary focus of this version is on the proportion of revenue (K) allocated towards maintaining cash holdings.

***The Cambridge version*:**

$M_d = {}_K PY$ 2.1

Where
M_d = Demand for money
Y= Real National Income
P= Aggregate Price level
PY = Nominal Income
k= Proportion of nominal income that people want to hold as cash balances
Demand for money in this theory is a linear function of nominal income. The slope of the function is equal to k, ($k=M_d/PY$).

The value of K in the Cambridge equation can be understood as the reciprocal of the income velocity of money balances denoted as V as formulated initially in the quantity

theory. The approach's primary emphasis is on the determinants that impact the demand for money instead of the consequences resulting from alterations in the money supply (Anyanwu, 1993).

In their study, Chinedu, Magaji, and Musa (2021) employ the ARDL Bound Testing Approach to analyse the influence of money market instruments on Nigeria's economic growth from 1994-2018. The outcomes disclosed the presence of long-term association among different money market instruments. Furthermore, this analysis illustrates that money market variables significantly negatively influence short- and long-term economic growth. Commercial bank papers' influence on economic growth is relatively positive. This paper posits that the Central Bank should prioritise Treasury Certificates due to their significant impact on economic growth. Nevertheless, this analysis concludes in 2018 and does not encompass the subsequent timeframe leading up to 2022.

In their study, Mehar (2022) examines the influence of monetary policy on economic development and growth. It centres explicitly on the effects of private-sector loans on trade and company activities. The study employs panel least square methods to analyse data from 186 nations spanning 18 years. The findings indicate a favourable association among foreign debt, credit to the private sector, infrastructure investment, and their impact on economic growth and development. Consequently, this paper proposes augmenting the allocation of credit extended to the private sector. This study focuses on providing credit to the private sector, explicitly examining 18 years.

Takon and Ita (2020) investigate the influence of monetary policy on price stability in Nigeria. One of the objectives was to analyse the influence of MS, INTR, and EXR on price stability. The study employed a design that facilitated exploratory research. The secondary statistics of the CBN Bulletin were sourced and employed. The study employed multiple regression statistical methods to establish an association among variables, utilising ordinary least squares. The study encompasses the period from 2007 to 2016. The findings indicate an insignificant correlation between interest rates and inflation. However, a strong and meaningful association between money supply and inflation was seen. The currency rate significantly impacted inflation. It focuses exclusively on the influence of monetary policy and price stability in Nigeria without considering the effects on economic growth.

The effects of monetary policy on different economic sectors exhibit variation. In the study conducted by Haug (2021), an analysis is undertaken to investigate the characteristics and implications of both tight and flexible monetary policy regimes. The selection of either type is contingent upon the necessity to uphold the equilibrium of the balance of payments and attain price stability. The monetary policy goal extends beyond promoting the productive sector of an economy and facilitating sustainable economic expansion. It also encompasses the attainment of equilibrium in both the external and internal valuation of currency (Ozuzu & Isukul, 2021).

Victor, Chinyelu, Chibueze, Chukwubuzo, and Adewale (2021) analyse the adjustment of money market and retail interest rates in Nigeria, specifically in reaction to alterations made to the discount corridor of the country's monetary policy. Monthly data from June 2007 to December 2019 were utilised with a vector error correction model to conduct this analysis. To enhance dependability on policy, consideration is also given to the structural

deficiencies in the data collection. Despite the modest movement of the alteration parameters, they were considered significant. The present study demonstrates that the discount corridor employed in transmitting Nigeria's monetary policy needs to be revised.

Furthermore, the results suggest that retail prices did not exhibit asymmetric adjustments towards long-term equilibrium. Ultimately, the study revealed that alterations in the standing lending facility exhibit a contrasting impact on deposit rates. The findings indicate that various writers have employed diverse methodologies to examine monetary policy. However, including empirical evidence derived from structural vector autoregressive (SVAR) modelling is necessary. Moreover, the results suggest that raising the standing borrowing capacity cannot enhance bank deposit rates.

The study by Musa, Magaji, and Salisu (2022) examines the influence of monetary policy shocks on the RGDP of Nigeria. The study employs SVAR modelling to analyse quarterly time series data from 1986Q1 to 2017Q4. The findings indicate that monetary policy positively influences RGDP. The monetary policy rate, commonly referred to as MPR, exerts a positive influence on economic growth. Nevertheless, its influence was minimal, making a mere 3% contribution. Furthermore, a positive shock was observed in the broad measure of money supply, M2, but its contribution to the overall total was limited to a maximum of 7%. The study's findings suggest that the inflation targeting (IT) framework is valuable for implementing monetary policy, although it is deemed inadequate in isolation. There exists a necessity for additional auxiliary instruments.

This study has utilised the structural Vector Autoregressive (SVAR) model and concludes its analysis at the end of the fourth quarter of 2017 without extending its coverage to 2022. Hence, it is imperative to conduct a comprehensive investigation employing the autoregressive distributed lag methodology, including extensive timeframes and current data, to explore the influence of monetary policy on RGDP in Nigeria. Accomplishing the following objective is the aim of this study:

3. Research Methods

The study utilised econometric techniques to investigate the impact of monetary policy on the economic growth of Nigeria. The selected independent variables for this study encompass the broad money supply, exchange rate, inflation rate, and interest rate. The chosen dependent variable is real gross domestic product (GDP), a proxy for quantifying economic growth.

This investigation employs a secondary source of time series data from 1990 to 2022. The relevant data about the broad money supply (M2), interest rate (INTR), inflation rate (INF), and exchange rate (EXR) were obtained from volume 9 of the Statistical Bulletin issued by the Central Bank of Nigeria. The primary aim of this study is to evaluate the correlation between Nigeria's monetary policy and the rate of economic growth over 32 years, namely from 1990 to 2022. Thus, the current study integrates the research completed by Musa, Magaji, and Salisu (2022).

$RGDP = (MPR,, M2)$ ……..…3.1

$LRGDP = \alpha 0 + \alpha 1 LMPR + \alpha 2\ LINF + \alpha 3\ LM2 + \varepsilon$ …….....3.2

The error term, represented as ε, is hypothesised to conform to a white-noise process with a mean of zero and a consistent variance of δ^2. In the provided context, the coefficient α signifies the estimated variables that are associated with it. The acronym LRGDP is used to signify the natural logarithm of real GDP. Similarly, LMPR represents the natural logarithm of the monetary policy rate. INF is an abbreviation for the inflation rate approximated by the consumer price index. Lastly, LM2 refers to the natural logarithm of the broad money supply. The model of this study is constructed by reorganising its structure in the following manner:

$$RGDP = \beta_0 + \beta_1 MS + \beta_4 INTR + \beta_3 INF + \beta_2 EXR + Ut \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.3$$

Where:
RGDP= Real Gross Domestic Product Growth Rate
MS=Broad Money Supply
INTR = Interests rate
INF =Inflation Rate
EXR = Exchange rate
β_0, β_1, β_2, β_3, β_4 = Parameters
U_t = Error term

The research utilised the unit root test and autoregressive distributed lag (ARDL) model to analyse the impact of monetary policy on economic growth in Nigeria from 1990 to 2022. The present study utilises a research methodology encompassing autoregressive distributed lag regression analysis, stability testing, and Granger causality testing.

4. Results

Investigating the descriptive properties of the variables utilised in this study is vital. Table 4.1 displays the descriptive statistics for the variables.

Table 4.1 Descriptive Statistics

	RGDP	MS	INTR	INF	EXR
Mean	4.891797	10708.61	31.16909	18.0861	136.6058
Maximum	17.5	50580.55	448.89	72.836	472.25
Minimum	-2.035	68.66	7.28	5.388	-14.66
Std. Dev.	4.420105	12901.14	75.0903	16.14999	110.8017
Skewness	0.846841	1.350862	5.456381	2.17999	1.012931
Kurtosis	4.05007	4.394711	30.86341	6.756449	3.986049
Sum	161.4293	353384.1	1028.58	596.8413	4507.99
Observations	33	33	33	33	33

Source computed by the researcher using E-views version 10 (2023)

The descriptive statistics of the variables are presented in Table 4.1. The dataset comprises 33 observations, encompassing five distinct time series variables: RGDPt, MSt, INTR, INFt, and EXRt.

Monetary aggregate, namely MSt, exhibits an average value of 10708.61, the highest of the observed values. Additionally, it is accompanied by a standard deviation of 12901.14. The subsequent variable, EXRt, exhibits an average value of 136.6 and a standard

deviation 110.8. The average values for INTR and INFt are 31.17 and 18.08, respectively. The corresponding standard deviations for these variables are 75.0 and 16.1. RGDPt is a dependent variable, showing an average value of 4.9% and a standard deviation of 4.4%, as observed. All the variables exhibited a positive skewness. The examination of the variables' kurtosis indicated a favourable skewness. This indicates that the variables exhibited a leptokurtic distribution, characterised by a flatter left tail compared to the normal distribution, resulting in a shorter tail or a distribution with less extreme values.

The unit root test was used to assess the stationary characteristics of the series and establish the level of integration. The ADF unit root test was utilised to determine the exact degree of integration and the stationary characteristics of the variables. The findings of these examinations are displayed in Table 4.2.

Table 4.2 Unit Root Tests

LEVEL					
Test/Variables	**$RGDP_t$**	**MS_t**	**EXR_t**	**INF_t**	**$INTR_t$**
ADF	-3.042307	3.777297	0.041438	-2.154161	2.956017
	(0.0416)	(1.0000)	(0.9555)	(0.2261)	(1.0000)
FIRST DIFFERENCE					
Test/Variables	**$D(LOGMS)_t$**	**$D(EXR)_t$**	**$D(INF)_t$**	**$D(INTR)_t$**	
ADF	-3.361275	-8.116857	-4.571329	-2.455312	
	(0.0205)	(0.0000)	(0.0010)	(0.0160)	

Source: computed by the author using E-views. Version 10 (2023)

The unit root test results, as shown in Table 4.2, suggest that, except for RGDP, all the variables were determined to be non-stationary at a level indicated by higher probability values and ADF statistics. According to the data shown in Table 4.2, it was considered necessary to evaluate the stationarity of variables by taking their first difference, as they were found to be non-stationary at their original levels.

After differencing on the series, the results indicate that the null hypothesis of non-rationality in each series may be rejected at a significance level of 5%. As a result, the series has been integrated into various orders, namely I(1) and I(0). The results of this study offer empirical evidence in favour of applying the ARDL bound test and cointegration test. The application of the autoregressive distributed lag (ARDL) model is suitable in cases when the variables demonstrate a combination of integrated order one (I(1)) and stationary (I(0)) characteristics or when all variables are stationary, as long as none of the variables exhibit integrated of order two (I(2)) qualities.

The selection of an optimal latency for calculating the F-statistics is of utmost importance when utilising the ARDL limits testing approach. The performance of the autoregressive distributed lag (ARDL) model is contingent upon the selection of an appropriate lag order. Lütkepohl (2006) asserts that the Akaike information criterion (AIC) performs better than alternative lag length criteria.

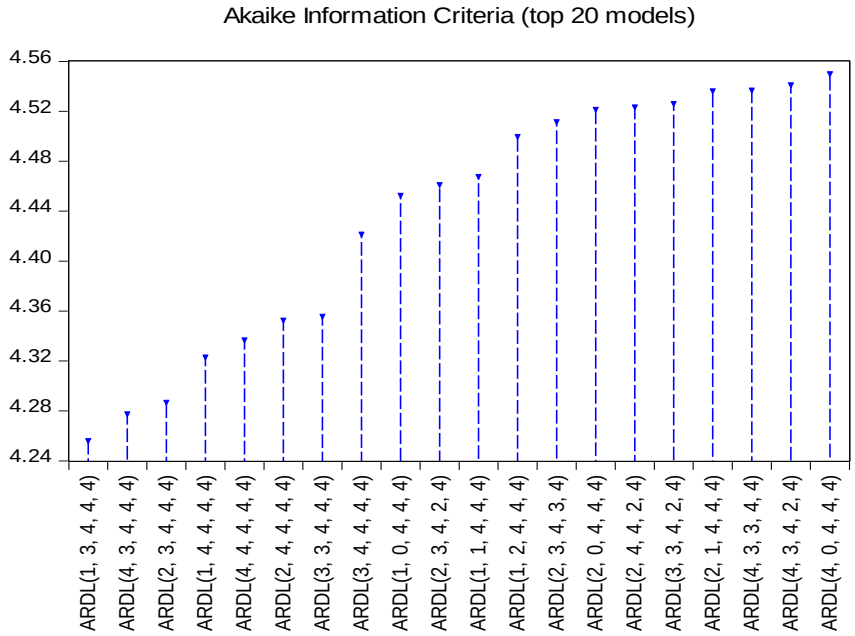

Figure 1 Akaike information criterion

Source: Generated by the author using E-views version 10 (2023)

The technique outlined in this study has identified and ranked the top twenty (20) models, as presented in Figure 1 above. The ARDL (1, 3, 4, 4, 4) model has been picked as the most optimal choice due to the absence of readily approximable alternatives among the models under consideration. To investigate the enduring correlation among the RGDPt, MSt, INTR, INFt, and EXRt, the ARDL (1, 3, 4, 4, 4) model is utilised.

The following table, Table 4.3, displays the results obtained from utilising the ARDL limits testing approach to analyse the influence of pension funds contribution on the economic growth of Nigeria.

Table 4.3 ARDL BOUNDS TEST Results, Null Hypothesis: No Relationship

Test Statistic	Value	K
F-statistic	6.679943	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.2	3.09
5%	2.56	3.49
1%	3.29	4.37
N=33		

Source: computed by the author using E-views. Version 10 (2023)

Based on the results obtained from the ARDL bounds testing approach to cointegration, it is observed that the F-statistic, with a value of 6.679943, exceeds the upper critical bounds for significance levels of 1%, 5% and 10% when the predicted variable is RGDP.

The results of this research offer empirical support for the presence of cointegration among the variables for the entire timeframe from 1990 to 2022. However, because of the restricted size of our sample, we utilise the pivotal values suggested by Narayan (2005). Based on the data shown in Narayan's table, it can be observed that the critical value for the upper bound is 4.088, whilst the critical value for the lower bound is 2.947. The bound test demonstrates an f-statistic of 6.679943, which exceeds the critical values of 4.088 and 2.947. Thus, even when considering a significance threshold of 5%, the null hypothesis, which suggests the lack of a long-term connection, is unequivocally rejected. Therefore, the finding implies a consistent relationship between the rate of increase of RGDPt, MSt, INTR, INFt, and EXRt from 1990 to 2022.

The subsequent procedure entails the estimation of regression coefficients for both the long-run and short-run while considering error correction variables. This estimation is undertaken to ascertain the rate at which the cointegrating variables adapt to their equilibrium relationship. Before making this estimation, it is essential to determine the existence of a long-term relationship between the variables by employing the ARDL bounds testing approach for cointegration. The variable estimates derived from the autoregressive distributed lag (ARDL) regression are displayed in Table 4.4.

Table 4.4 ARDL Estimates

Dependent Variable: RGDP				
ARDL Long-Run Estimates				
Variables	**Coefficient**	**SE**	**t-values**	**P-Value**
LOGMS	-10.68183	5.688933	-1.877651	0.0973
INF	-0.430712	0.134211	-3.209225	0.0124
EXR	0.050794	0.025969	1.955893	0.0862
INTR	-1.325064	1.322752	-1.001748	0.3458
C	68.14443	43.93435	1.551051	0.1595
ARDL Short-Run Estimates				
Variables	**Coefficient**	**SE**	**t-values**	**P-Value**
Δ(LOGMS)	-4.637765	7.001002	-0.662443	0.5263
Δ(LOGMS(-1))	0.203737	8.000112	0.025467	0.9803
Δ(LOGMS(-2))	22.97115	7.805904	2.942792	0.0186
Δ(INF)	-0.371846	0.051754	-7.184899	0.0001
Δ(EXR)	-0.013296	0.012015	-1.106631	0.3006
Δ(EXR(-1))	-0.076944	0.020335	-3.783820	0.0054
Δ(INTR)	0.014430	0.019235	0.750190	0.4746
Δ(INTR(-1))	0.883345	0.195900	4.509160	0.0020
ECT_{t-1}	-0.866789	0.107405	-8.070282	0.0000
Diagnostic Tests	**Statistic**	**P-Values**		
R-squared	0.935950			
Adjusted R-squared	0.862045			
F-statistic	6.826081			
Prob(F-statistic)	0.004480			
***J-B*-Normal**	0.395163	0.820713		
***F*-Serial**	0.581037	0.5879		
***F*-B-P-G**	2.270478	0.1175		
***F*- RESET**	0.010677	0.9206		

Source: computed by the author using E-views. Version 10 (2023)

The F-value is employed to evaluate the null hypothesis that the coefficients of all actual slopes are equivalent to zero. The obtained probability value is 0.010677, and the F-statistics produce a value of 6.826081. The findings of this study indicate a statistically

significant level of 5%. This observation suggests that the model has a robust fit and demonstrates statistical significance, establishing a substantive association between the dependent and independent variables. The R-squared value for the ARDL regression model is 0.935950. This implies that the model effectively explains around 93% of the overall variation in RGDP that can be ascribed to the independent variables.

Based on the statistical analysis results, the null hypothesis of normality is accepted at a significance level of 5%. This result is substantiated by the statistical evidence that the probability value of 0.820713 is above the predetermined threshold of 0.05, suggesting a greater probability that the error terms conform to a normal distribution. Furthermore, the JB-statistic (X2) of 0.395163 is determined to lack statistical significance at the 5% level, providing additional support for accepting the null hypothesis.

The results of the Breusch-Godfrey (BG) general autocorrelation test support the null hypothesis that there is no serial correlation. The F-statistic, which has a value of 0.581037 and a corresponding probability value of 0.5879, does not exhibit statistical significance at the 5% level. Therefore, it may be deduced that the model does not indicate serial correlation.

Furthermore, the Breusch-Pagan-Godfrey (B-P-G) test, utilised to assess the presence of homoskedasticity in the error terms, yielded an F-statistic of 2.270478. However, this result is deemed statistically unimportant at the 5% significance level due to the probability value of 0.1175; it exceeded the threshold of 0.05. Consequently, it can be inferred that heteroskedasticity was not detected in the model, thereby not posing a threat to H_0 of constant variance of the error term.

Ramsey RESET tests were employed to assess the correctness of model specification and misspecification tests. Based on the findings, it can be inferred that the probability value of 0.010677 is above the significance level of 0.05, indicating that the observed results were not statistically significant. Similarly, the F-statistics of 0.9206 were determined to be statistically unimportant at a 5% significance level. Consequently, it was deduced that there was no evidence of a specification error. This observation indicates that the model has a clear and precise definition.

Beginning with examining long-term effects, it was seen that the variable representing LMS exhibited statistical significance at a confidence level of 5%. In the interim, INF and EXR exhibited a notable significance level of 5%. The findings suggest a negative association between the logarithm of LMS and LRGDPt). Specifically, a 1% rise in LMS is associated with a 10% fall in LRGDPt while controlling for other variables. This suggests that the current rise in MS harms RGDP in Nigeria.

Furthermore, the regression analysis reveals that the coefficient estimate for INFt is -0.430712. It signifies that a 1% rise in INFt will cause a reduction of around 0.43% in the growth rate of LRGDPt if all other variables remain the same. In the given context, it is seen that the coefficient of EXR is 0.050794. This signifies that a 1% appreciation in EXRt will cause a 5.1% rise in the growth rate of LRGDPt if all other variables remain the same.

The short-run findings revealed that the first two lags of LMS were found to be statistically insignificant. However, when reaching the third lag, the coefficient of LOGMS is determined to be 22.97115. This coefficient exhibits a positive relationship and is deemed statistically significant at a 5% significance level. It indicates that a 1% rise in LMS will cause a 22% increase in the growth rate of LRGDPt after a two-period delay if all other variables remain the same.

At a significance level of 5%, the coefficient of inflation demonstrated a statistically significant negative connection. This value -0.371846 signifies that a 1% increase in INFt leads to a decrease of 0.37% in the growth rate of RGDPt if all other variables remain constant. Similarly, the coefficient -0.076944 indicates that EXRt demonstrated statistical significance with a two-period delay. This implies that, over a short period, a 1% rise in EXR will lead to a 0.07% decrease in the growth rate of RGDPt, holding all other variables constant. The results of the analysis suggest that there is a statistically significant association between INTRt and their lagged values. Specifically, the coefficient for the first lagged value is positive and equal to 0.883345. This finding indicates that a marginal rise of 1% in INTRt is associated with a corresponding increase of 0.88% in the rate of growth of RGDPt.

The statistical analysis reveals that the ECT-1 term exhibits a significant and negative association at a 1% significance level. This finding provides empirical support for the presence of a long-term association between RGDPt, MSt, INTRt, INFt, and EXRt in Nigeria over the period spanning from 1990-2022. The computed value for the ECTt-1 variable is -0.866789, suggesting that the correction of deviations from short-term to long-term equilibrium occurs at an annual rate of 86.7%. This finding implies that, according to empirical evidence, the system will automatically reestablish a condition of equilibrium after one year and two months after any state of disequilibrium.

The stability test is a crucial assessment conducted to evaluate the projected stability of the ARDL model. Two statistical tests, namely the cumulative sum of recursive residuals test and the cumulative sum of squares test, were employed to evaluate the stability of the coefficient. The present study aimed to examine the robustness of ARDL bounds testing estimates by applying the cumulative sum (CUSUM) and cumulative sum of squares (CUSUM sq) tests. The findings of these experiments are depicted in Figures 2 and 3. The CUSUM statistics plots successfully met the predetermined threshold of 5%. The CUSUM of squares statistical plots exhibited a slight deviation of 5% beyond the specified limit. The results of this study suggest that the estimates derived using the ARDL approach exhibited a notable degree of accuracy and dependability. The stability of the coefficients is demonstrated by the observation that the cumulative sum, depicted by the blue lines, remains within the confines of the two critical boundaries, represented by the red and blue lines.

Granger C

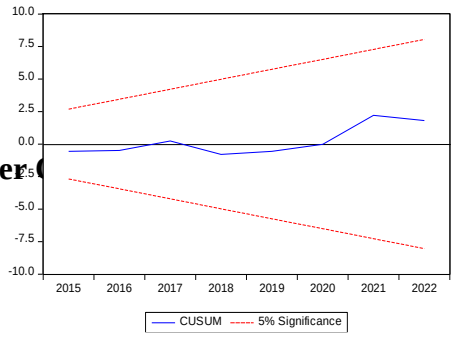

Figure2; CUSUM

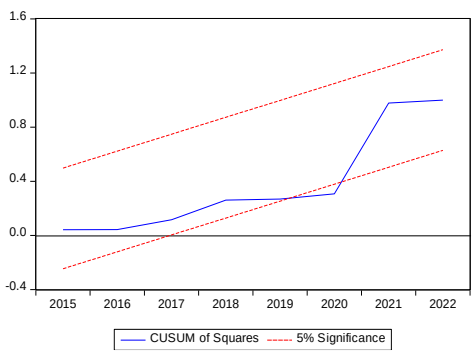

Figure3; CUSUM sq

The study in Nigeria involved using the Granger causality test to examine the presence of causation between various economic variables, including RGDPt, MSt, INTRt, INFt, and EXRt. The findings of the Granger causality test are presented in Table 3.

Table 3: Granger Causality/Block Exogeneity Wald Test
Source: Computed by the researcher using E-views 10 (2023)

Dependent variable: RGDP			
Excluded	**Chi-sq**	Df.	Prob.
LOGMS	4.732342	2	0.0938
INF	0.682980	2	0.7107
EXR	2.692102	2	0.2603
INTR	4.666157	2	0.0970
All	18.50049	8	0.0178
Dependent variable: LOGMS			
Excluded	**Chi-sq**	Df.	Prob.
RGDP	0.933773	2	0.6270
INF	0.645821	2	0.7240
EXR	3.609596	2	0.1645
INTR	1.967451	2	0.3739
All	8.035132	8	0.4300
Dependent variable: INF			
Excluded	**Chi-sq**	Df.	Prob.
RGDP	2.034708	2	0.3616
LOGMS	2.819975	2	0.2441
EXR	1.045394	2	0.5929
INTR	0.790419	2	0.6735
All	8.120875	8	0.4218
Dependent variable: EXR			
Excluded	**Chi-sq**	Df.	Prob.
RGDP	5.551668	2	0.0623
LOGMS	8.708034	2	0.0129
INF	3.772677	2	0.1516
INTR	20.47099	8	0.0087
All	20.47099	8	0.0087
Dependent variable: INTR			
Excluded	**Chi-sq**	Df.	Prob.
RGDP	10.18777	2	0.0061
LOGMS	15.71543	2	0.0004
INF	5.780922	2	0.0556
EXR	52.54843	2	0.0000
All	99.78933	8	0.0000

Table 3 presents the results of the Granger Causality Test, which was conducted to determine the causal relationship between the variables under investigation in this study. The results of the Granger Causality test indicate that when RGDP is treated as the dependent variable, none of the variables exhibit a statistically significant Granger causality relationship with RGDP. However, upon careful examination of the combined effects of the independent variables, it becomes apparent that they indeed impact the Real Gross Domestic Product (RGDP). This is supported by the joint probability value of

0.0178, below the significance level of 0.05, indicating statistical significance at a 5% confidence level.

Moreover, when considering LOGMS as the dependent variable, the analysis reveals that none exhibit Granger causality with LOGMS. However, when considering all the independent factors collectively, it can be observed that none of the variables significantly influenced the logarithm of MS (LOGMS), as demonstrated by their joint probability value of 0.4300. This value exceeds the threshold of 0.05, which is commonly used as the significance level at the 5% level.

Furthermore, when employing INF as the dependent variable, the analysis reveals that none of the variables exhibit Granger causality concerning INF. Nevertheless, upon considering all the independent variables collectively, it is evident that none of them exhibit a significant influence on the INF. This is supported by the joint probability value of 0.4300, which exceeds the 5% significance level.

Similarly, when using EXR as the dependent variable, it can be observed that RGDP and LOGMS have a Granger-causal relationship with EXR. Nevertheless, upon considering the collective impact of the independent variables, it becomes evident that they exert influence on the EXR, as evidenced by their joint probability value of 0.0087, which falls below the 5% significance level.

Furthermore, when considering INTR as the dependent variable, the analysis indicates that RGDP, LOGMS, and EXR have a significant Granger causality relationship with INTR. Nevertheless, upon careful examination of the combined effects of the independent variables, it becomes apparent that they exert a substantial influence on the dependent variable, as indicated by their joint probability value of 0.0000, which falls below the 5% threshold of statistical significance.

5. Conclusion and Suggestion

The study's outcomes suggest that monetary policy elements and tools significantly impact Nigeria's economic growth. The study reveals a noteworthy inverse association between MSt, INFRt, INTRt, and RGDPt, functioning as a near-term predictor for long-term economic growth. The study's findings lead to the conclusion that, except for INTRt, all monetary variables or instruments exert a statistically significant beneficial impact on Nigeria's long-term economic growth.

Consequently, the study suggests that monetary authorities emphasise employing a quality-based nominal anchor, primarily through the direct manipulation of interest rates and the promotion of exports, to bolster the value of the home currency.

The present study investigates the impact of monetary policy on economic growth in Nigeria using the ARDL model as the selected methodology. In contrast to previous research efforts, this study provides a more contemporary viewpoint. It investigates the notable monetary policy instruments, including the INFRt, EXRt, MSt, and INTRt, and their observable impacts on the economic growth of Nigeria.

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