

# Impact of monetary policy on economic growth in Nigeria (1990-2020)

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## ABSTRACT

Improving the rate of growth of real Gross Domestic Product (RGDP) has continued to be the most important policy of many countries, especially, the developing ones. Given the importance of ensuring economic growth in reducing poverty and ensuring improved welfare, it is imperative to identify its various determinants. Studies have identified the various determinants of economic growth, however, sustained economic growth continues to be a misery in Nigeria. This present study aims to determine the impact of monetary policy on economic growth in Nigeria. The study examined monetary policy on economic growth in Nigeria. In doing this, the study employed a time series data between the periods of 1990-2020. The methodology used involved examining the stationary nature of the data using Augmented Dickey-Fuller test and an ARDL bond test for examining the presence of long run relationship among the variables of the study. The short run regression conducted using ARDL regression method showed that monetary policy is an important determinant of economic growth in Nigeria. The two indicators of monetary policy used (Monetary Policy Rate, MPR and Money Growth Rate, M2) exert a significant impact on economic growth in Nigeria. Based on the findings, this study concludes that monetary policy significantly affects economic growth in Nigeria. It is recommended that policy makers in Nigeria should improve the monetary policy in such a way to increase the economic growth in Nigeria.

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## 1. Introduction

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Sustainable economic growth, one of the macroeconomic objectives of any country has been at the heart of monetary policy over the years. The Central Bank of Nigeria, CBN, considers the objectives and targets of monetary policy as the attainment of price stability and sustainable economic growth (CBN, 2017). More so, the successive government in Nigeria has embarked on policies aimed at fostering sustainable economic growth (Nwoko, Ihemeje, and Anumadu, 2016). Sustainable economic growth implies a rate of growth that can be upheld without creating other significant economic problems, especially for future generations. Accelerated growth in the current period can result in rapid resources depletion which can lead to environmental problems for future generations. and it has economic and social implications. This shows that there is a *trade-off* between rapid economic growth today, and growth in the future. Ideas and views about the economic growth process have been organized along three major theories among others: the neoclassical growth theory, the neo-Keynesian growth theory, and the endogenous theory of growth (Dornbusch, Fischer & Startz, 2011). These theories however differ in their explanations of the growth process. Similarly, studies in the empirical literature have considered different variables in the growth process, particularly, the role of monetary policy.

The Nigeria growth process has been characterized by periods of expansion and contraction. In the early period after independence, Nigeria's economy grew quite substantially (Ndubuisi, 2017), however, the sustainability of such growth remains a myth as the country was quickly bewildered by a period of shrinking growth. The economic recovery and growth plan of the 2017-2020 document highlighted that the general economic performance of the country is seriously undermined by deplorable infrastructure, corruption, insecurity, and poor governance (Ministry of Budget and National Planning, 2017). Nigeria, often referred to as the giant of Africa has, over the years, been battling with ensuring sustainable economic growth. Since 2011, Nigeria experienced steady growth averaged at 2.59 percent from 2011 until 2021 (World Bank, 2021), reaching an all-time high of 6.88 percent in the first quarter of 2011, however, in 2020 the Nigerian economy shrank by 1.8%, it was the deepest decline since 1983 but growth resumed in 2021 as pandemic restrictions were eased and oil prices recovered (World Bank, 2021). In response to the effect of the pandemic, the Central Bank of Nigeria cut the policy rate by 100 basis points to 11.5% to shore up a flagging economy. The fiscal deficit, financed mostly by domestic and foreign borrowing, widened to 5.2% in 2020 from 4.3% in 2019, reflecting pandemic-related spending pressures and revenue shortfalls (AfDB, 2021).

Monetary policy plays a stabilizing role in influencing economic growth through a number of channels. Monetary policy may influence a sustainable growth through the maintenance of price stability. Since sustained increase in price levels is regarded as a monetary phenomenon, monetary policy tools can be deployed to effectively check money supply with a view to maintaining price stability in the medium- and long-term basis. Theory and empirical evidence in the literature suggest that sustainable long-term growth is associated with lower price levels. A monetary policy action that cuts interest rate will lower the cost of borrowing, leading to higher investment activity and the purchase of consumer durables. The expectation that economic activity may also prompt banks to ease lending policy, which in turn enables business and households to boost spending. In a low interest-rate regime, stocks become more attractive to buy, raising households' financial assets. This may also contribute to higher consumer spending, making companies' investment projects more attractive. Low interest rates also tend to cause currency to depreciate because the demand for domestic goods rises when imported goods become more expensive. The combination of these factors raises output and employment as well as investment and consumer spending.

In Nigeria, monetary policy has been based on a medium-term perspective framework in recent times. The shift was to free monetary policy implementation from the problem of time inconsistency and minimize over-reaction due to temporary shocks. Policies ranging from targeting monetary aggregates to monitoring and manipulating policy rates steer the interbank rates and extend other market rates in a desired direction (Uchendu, 2009). The extent to which these strategies have helped to engender the growth of the Nigerian economy is of immense concern to policymakers and academics. There have been various regimes of monetary policy in Nigeria. Sometimes, monetary policy is tight and at other times is loose, mostly used to

stabilize prices. The economy has also witnessed times of expansion and contraction, but evidently, the reported growth has not been a sustainable one as there is evidence of growing poverty among the populace. The question is, could the period of growth be attributed to appropriate monetary policy? And could the periods of economic downturn be blamed on factors other than monetary policy ineffectiveness? These are the questions that remain unresolved in Nigeria, which this study would attempt to answer.

## 2. Literature Review

### 2.1 Conceptual review

Economists usually measure economic growth in terms of gross domestic product (GDP) or related indicators, such as gross national product (GNP) or gross national income (GNI) which are derived from the GDP calculation. GDP is calculated from a country's national accounts which report annual data on incomes, expenditure, and investment for each sector of the economy. Using these data, it is possible to estimate the total income earned in the country in any given year (GDP) or the total income earned by a country's citizens (GNP or GNI). Brundtland Report cited in (Malaska, Kaivo-Oja & Luukkanen, 1999) Sustainable Development (SD) is generally expressed as an ethos that "humanity has the ability to ensure that it meets the needs of the present without compromising the ability of the future generations to meet their own needs." Since 1970, argument on economic growth, as usual, remained both feasible and desirable. These arguments have been centred on whether a growing economy does not run out of natural resources nor cause too many environmental harms. Economic growth was considered not only to bring with it the overall improvement of life and more equal opportunity for people, but was also regarded as necessary to finance improvements to the deteriorated environment (Malaska, Kaivo-Oja & Luukkanen, 1999) The malthusian position that the environmental protection policy and the promotion of economic growth objectives were incompatible (i.e. that no long-run - more than 100 years - growth objectives, as usual, were feasible). This line of thinking led to calls for a steady state (zero growth) economy. The zero-growth argument was buttressed by socio-economic analyses, which sought to highlight the social and environmental costs of living in a 'growth society' (Malaska, Kaivo-Oja and Luukkanen, 1999).

Monetary policy based on the monetary theory that change in money supply, is the main driver of changes in economic activities. It is based on the premise that if a nation's supply of money increases, economic activities should also increase and vice versa (Friedman, 1969). This is the foundation of the classical quantity theory of money through which monetary policy found its way into the mainstream economic policy space. Being one of the major tools of economic stabilization, monetary policy involves the use of money and monetary aggregates to achieve the multiple macroeconomic objectives of price stability, economic growth, full employment, external balance and exchange rate stability (Layi, 1998). The Central Bank of Nigeria, CBN (2018), monetary policy is a deliberate action of the monetary authorities to influence the quantity, cost and availability of money and credit in order to achieve desired macroeconomic objectives of internal and external balances. The Bank went further --this monetary policy action is carried out through changing money supply and/or interest rates with the aim of managing the quantity of money in the economy. The process that describes how changes in monetary policy propagate to other parts of the economy is called the transmission mechanism of monetary policy. It describes how changes in policy transmit through the financial system, via financial prices and quantities, to the real economy, affecting aggregate spending decisions of households and firms, and aggregate demand and inflation.

Policy goals such as inflation, unemployment, economic growth, exchange rate stability and external balance are the ultimate variables of interest which monetary policy seeks to influence. For most Central Banks, the ultimate objective is the attainment of price stability and sustainable economic growth. Other underlying objectives are full employment and stable and long-term exchange rate (CBN, 2017). In the same vein, observations on the goal variables of monetary policy such as inflation, unemployment, economic growth are often less frequent than are data on interest rates, exchange rates, or monetary

aggregates, thus, behaviour of the latter variables often guide the Central Bank on what affects the goal variables (Wash, 2010). Intermediate target guides policy makers as a step between instrument and goal. Intermediate targets lie between operating target and policy goal. They are economic variables which are vital to monetary policy outcome but are not directly under the control of the Central Bank. Variables for monetary policy intermediate targets are interest rates, monetary aggregates, and exchange rates (CBN, 2017). The transmission of monetary policy is hinged on monetary instruments, among which are open market operation (OMO), reserve requirement (RR) and discount rate (DR). Open market operation (OMO) is the way by which monetary authority increases or decreases the stock of money in the economy through the sales and purchases of government securities in the financial market (CBN, 2017). A sale of security reduces money stock in the economy while a purchase of securities releases money into the economy (CBN, 2017). Reserve requirement (RR) is the way by which the Central Bank control credit by varying the amount or ratio of total deposit that banks are required to keep as cash reserves (CBN, 2017). On the other hand, discount rate (DR) is the interest charged by Central Bank on short term lending to commercial banks (CBN, 2017). Bindseil (2004) outline two important uses of operating target in the conduct of monetary policy. First, that it gives guidance to the implementation officers in the Central Bank as to what to do on a day-by-day basis in the inter-meeting period, and second, that it serves to communicate the stance of monetary policy to the public (Bindseil, 2004).

Monetary policy transmission mechanism in Nigeria traces the relationship between changes in the supply of money and real variables such as output, employment, and prices of goods and services. Kyari (2015) classified the transmission process of monetary policy into two stages; the first stage involves the propagation of changes in monetary policy through the financial system. This stage of the transmission mechanism explains how changes in the market operations of Central Banks transmit through the money market to markets which directly affect spending decisions of individuals and firms, that is, the capital and bond market and the bank loan market. The second stage of the transmission mechanism involves the propagation of monetary policy shocks from the financial system to the real economy. There are five major channels of monetary policy transmission. They are the interest rate channel, the credit channel, exchange rate channel, asset price channel, and inflation expectations channel.

The empirical survey by (Taylor, 1995) revealed that the Interest rate channel has strong empirical evidence for substantial interest rate effects on consumer and investment spending. Evidence by European Central Bank (ECB, 2000) indicates that interest rate channel plays an important role in the transmission of monetary shocks. Accordingly, direct and indirect effects of interest rate changes including wealth and exchange rate effect on investment could explain the reasons why 80 percent of the total response of output to monetary stocks after a lag by three years. The credit channel relates to how bank lending and the bank balance-sheet management transmits monetary policy. It has been argued by Rodriques(1993) that the behaviour of the lending rate becomes less important if the demand for bank deposits is sufficiently elastic. An increase in Treasury bill rates will move deposits out of the banking system, thus affecting aggregate demand through the availability of credit, rather than through its cost. Banks' lending will depend on banks financial structure and lending opportunities as well as on market interest rates. The effects of monetary policy on bank lending will, therefore, depend on the capital adequacy of the banking sector. The balance-sheet channel on the other hand, simply imply that the shape of the marginal efficiency of invest (MEI) curve is a function of the debt-equity ratio in the economy and can be affected by monetary policy. It is believed that both distributional impact of monetary policy and small changes in interest rates impacts on investment. Changes in exchange rate have implication on the spending behaviour of individuals and firms which in turn affect the aggregate demand of goods and services. Under a flexible exchange rate regime, expansionary monetary policy depreciates domestic currencies and increases the prices of imported goods (Dornbusch, Fischer & Startz, 2011).

Inflation expectation transmission mechanism is another strong mechanism for monetary policy. They are transmitted into the economy when firms adjust their prices in response to their perception of how future prices would trend. It has been argued in some quarters that, a well-anchored inflation expectation is

essential for the securing of price stability and facilitating overall economic stability. Thus, with well anchored expectations, monetary policy can easily respond to stocks, and central banks would have greater flexibility in responding to financial market disturbances. Furthermore, the commitment of monetary policy to reduce inflation is credible if its effectiveness is enhanced by its potential to reshape inflation expectations.

## 2.2 Theoretical review

The Solow-Swan growth model of Swan (1956) and Solow (1956) focuses on three factors that impact economic growth: labour, capital, and technology, or more specifically, technological advances. In this model, output per worker (growth per unit of labour) increases with the output per capita (growth per unit of capital) but at a decreasing rate. This is referred to as diminishing marginal returns. Therefore, there will become a point at which labour and capital can be set to reach an equilibrium state. Since a nation can theoretically determine the amount of labour and capital necessary to remain at that steady point, it is technological advances that really impact the economic growth. The theory states that economic growth will not take place unless there are technological advances, and those advances happen by chance. Once an advance has been made, then labour and capital should be adjusted accordingly. It also suggests that if all nations have access to the same technology, then the standard of living will all become equal.

Neo-Keynesians theorist initially emerged from the ideas of the Keynesians. One of the major developments under Neo-Keynesian theory was the concept of 'potential output', which at times is referred to as natural output. This is a level of output where the economy is at its optimal level of production, given the institutional and natural constraints. This level of output also corresponds to the natural rate of unemployment, or what is also referred to as the non-accelerating inflation rate of unemployment (NAIRU). In this particular framework, the built-in inflation rate is determined endogenously, that is, by the normal workings of the economy. According to the neo-Keynesian postulates, the transmission of monetary policy is a function of private expenditure being interest elastic such that changes in interest rate would cause a change in aggregate demand, output and inflation. Thus, the neo-Keynesian growth theory placed a significant role on monetary policy. The endogenous growth theory was first created due to deficiencies and dissatisfaction with the idea that exogenous factors determined long-term economic growth. In particular, the theory was established to refute the neoclassical exogenous growth models, as it made predictions about economic growth *without factoring in technological change*.

## 2.3 Empirical review

Mutuku and Koech (2014) who applied the recursive VAR methodology on time series data from 1997-2010 estimated the impact of monetary and fiscal policy shocks on economic growth in Kenya (both money supply and short-term interest rates) as insignificant in influencing the real output. They argue that the weak nexus is attributed to weak structural, institutional, and regulatory framework. Using the vector auto regressive (VAR) model to measure the effect of monetary. Chipote and Palesa (2014) explored the role played by monetary policy in promoting economic growth in the South African economy over the period 2000-2010 using time series analysis of cointegration. The study shows that a long run relationship exists among the variables. Also, the core finding of this study shows that money supply, repo rate and exchange rate are insignificant monetary policy instruments that drive growth in South Africa whilst inflation is significant. The study therefore recommends that monetary policies should be used to create a favourable investment climate that attracts both domestic and foreign investments thereby promoting a sustainable economic growth. The government should also increase government spending on the productive sectors of the economy to promote economic growth as monetary policy alone is unable to effectively spur economic growth. Amiri and Ganye (2018) explores the impact of monetary policy on economic growth of the United States of America using data from 1970 to 2016. To determine the relationship between two Monetary Policy on Economic Growth. TVPFAVR technique was used. The results shows that monetary policy

affects economic growth in the short term, medium term, and long term. Interest rates on short-term, medium-term, and long-term impact on economic growth as negative, positive, increase and decrease. Inflation in the short term, medium term and long term has positive impact on economic growth.. Sena, Asante & Brafu-Insaidoo (2021) investigated monetary policy and economic growth of Ghana using Autoregressive Distributed Lag (ARDL) approach, this study investigated whether financial development influences the effectiveness of monetary policy and assessed their joint effect on economic growth in Ghana from 1980 to 2016. The results revealed that financial development strengthens the effectiveness of monetary policy on economic growth in Ghana. The study therefore recommended that Bank of Ghana should further deepen financial sector development and improve on the competitiveness of financial markets in order to improve on the capacity of monetary policy to enhance the growth of the economy.

Anowor and Okorie (2016) who adopted the Error Correction Model approach empirically assessed the impact of monetary policy on economic growth of Nigeria.. It utilized time series secondary data spanning between 1982 and 2013. The result showed that an increase in a unit in Cash Reserve Ratio (CRR) could lead to approximately seven units increase in economic growth in Nigeria. Ayodeji and Oluwole (2018) examined the impact of monetary policy on economic growth in Nigeria by developing an index that proxied the variables of monetary policy instruments to include: Money Supply (MS), Exchange Rate (ER), Interest Rate (IR), and Liquidity Ratio (LR). Economic growth was represented by Gross Domestic Product (income) at constant prices. The result shows that (money supply and exchange rate) had a positive but fairly insignificant impact on economic growth. Measures of interest rate and liquidity ratio on the other hand, had a negative but highly significant impact on economic growth. Ikeora, Emeka, and Arinze (2019) studied the impact of monetary policy on economic growth in Nigeria for the period between 1990 and 2017. The study used Gross Domestic Product as proxy for economic growth whereas, monetary policy rate, liquidity rate and Treasury Bills respectively were used as the explanatory variables to measure monetary policy. Using Ordinary Least Square (OLS) techniques, the study found a significant impact of Treasury Bills, liquidity rate and monetary policy rate on Gross Domestic Product in Nigeria. Muhammed, Babawulle, and Tahir (2021) used annual data over the period 1981 to 2016, to examine the impact of monetary policy on the Nigerian economy. In doing this, Augmented Dickey-Fuller unit root test, Vector error correction mechanism (VECM) and the ordinary least squares (OLS) method were employed to analyse the time series data for the period between 1981 and 2016. The result of the analyses shows that monetary policy represented by money supply exerts a positive impact on GDP growth with negative impact on rate of inflation. Recommendations from the study were that monetary policy should facilitate a favourable investment climate through appropriate interest rates, exchange rate and liquidity management mechanism and the money market should provide more financial instruments that satisfy the requirements of the ever-growing sophistication of operators.

Ani (2021) investigated the effect of monetary policy on economic growth during post structural adjustment programme in Nigeria. Secondary data for the period between 1985 and 2015 were utilized. The data were extracted from the Central Bank of Nigeria (CBN) Statistical Bulletin and the National Bureau of Statistics (NBS). The linear regression with the application of Ordinary least Squares (OLS) technique was employed to estimate the parameters of the model numerically. The findings revealed that broad money supply had a positive and significant effect on economic growth in Nigeria during post structural adjustment programmer from 1986 to 2015. Interest rate had a negative and significant effect on economic growth in Nigeria during the same period and inflation rate had a positive and insignificant effect on economic growth in Nigeria at the same time. Aliu (2022) examined the effectiveness of monetary policy in stimulating economic growth in Nigeria between 1990 and 2019 using the theoretical framework of Keynesian transmission mechanism. The ARDL Bounds Test result indicated that there is long run relationship among the variables with the lower bound and upper bound less than the calculated at 5% level of significance. The result of the error correction mechanism (ECM) test indicates an 88% adjustment back to equilibrium. Since the economic growth in Nigeria is greatly influenced in the long run by the interest rate and reserve

requirement, it is therefore recommended that monetary policy can be an effective tool in stimulating economic growth.

### 3. Methodology

#### 3.1 Theoretical framework

This study adopts the neo-classical growth model of Solow-Swan (1956) as the theoretical framework. The economic growth is the dependent variable in this study. The aggregate production function on which the economic growth relationship is based can be stated as in equation (1) below:

$$Y = Af(L,K) \quad (1)$$

Where, Y = output (GDP), K = capital, L =labour and A = total factor productivity (TFP).

This study simulates a simple production function in which the factors of production in the economy determine the level of economic output. This is summarized as:

$$Y = f(K, L) \quad (2)$$

Where Y measures economic growth (proxy with GDP growth), K denotes the amount of capital (measured by Gross Fixed Capital Formation), and L is the labour (measured by total labour force participation rate). We consider a Cobb-Douglas type of production function which is specified as follows:

$$Y = AL^\alpha K^\beta \quad (3)$$

Linearizing equation (3), it becomes:

$$\log Y = \log A + \alpha \log L + \beta \log K \quad (4)$$

Where L and K are as previously defined, and A is the parameter that captures the effects of other factors of production. A is a measure of Total Factor Productivity (TFP). It is through this A that the study intends to capture the impacts of monetary policy on economic growth. Traditionally, changes in A are thought to capture the technological changes (Solow, 1956) but these may not be due to technology. The effects of other factors like war, natural disaster, policies, and economic reforms may also stem from A channels. Based on this, we, therefore, specify model with some other control variables.

#### 3.2 Model specification

to the present study determines the impact of monetary policy on economic growth in Nigeria. Antwi, Mill, and Zhao (2013) asserted that growth is affected by factors such as natural resources, investment, human capital, innovation, technology, monetary and fiscal policies. In this study, economic growth is used as the dependent variable. Economic literature postulates several variables that could determine economic growth. Gross Fixed Capital Formation (GFCF): GFCF is expected to have a positive impact on GDP growth. With more capita per labour, output per labour increases, leading to economy growth. Theoretically, Capital is an important source of growth, the rate at which a country grows depend on how much of her income is saved and reinvested in capital for labour. The higher the capita per labour, the higher the rate of growth and vice versa. Exchange Rate Depreciation (EXCR is the rate of nominal exchange rate depreciation. It should have a positive impact on economic growth. An appreciation of exchange rate means that when the international value of a country's currency increases, the

competitiveness of a country's product in the international market and growth reduces. Depreciation, on the other hand, improves the competitiveness of a country's product and therefore increases the demand and economic growth. This study considers the rate of exchange rate changes as one of the determinants of economic growth.

Labor Force Participation Rate (LFPR): Theoretically, labour is expected to promote economic growth, especially where equipped with necessary capital. Therefore, in this study, labour measured by labor force participation rate is expected to have a positive impact on economic growth. Inflation Rate (IFLR): Inflation has a due effect on economic growth. Theoretically, low to mild inflation encourages production and promotes economic growth. On the other hand, high inflation distorts market prediction, erodes values and distorts growth. Broad Money Supply Growth (M2): the rate of money supply growth in an economy is denoted in this study by M2, it determines how much money the financial system can create and in an underemployed economy., According to the neo-classist, increasing M2 means more money is in the economy. This pulls down the cost of capital and thus, investors are able to borrow more and invest more leading to more economic growth and vice versa. Monetary policy Rate (MPR): MPR is the interest rate at which CBN lends to the commercial banks. The MPR is the benchmark against which other lending rates in the economy are pegged and is usually used as an instrument to moderate inflation and economic growth in an economy. A low policy rate is used to promote growth as commercial banks can lend to investors at lower interest rate and this improves the demand for investment fund and promotes economic growth and vice versa.

The functional specification of the regression model is given below in equation (4).

$$GDPg = f(CONT, MPR) \quad (5)$$

where GDPg is the growth rate GDP, which is considered to be the one of the macroeconomic targets of monetary policy, CONT is used to represent a list of the control variables that theoretically affect the economic growth, such as, capital, labour, exchange rate depreciation, and inflation rate, MPR is the vector of the variables of interest, that is, monetary policy rate and broad money. This gives:

$$GDPg = f(MPR, M2, LFPR, GFCF, EXCR, INFR) \quad (6)$$

Transforming the relationship in equation 6 into an econometric model give:

$$GDPg_t = \beta_0 + \beta_1 MPR_t + \beta_2 M2_t + \beta_3 LFPR_t + \beta_4 GFCF_t + \beta_5 EXCR_t + \beta_6 INFR_t + U_t \quad (7)$$

where  $\beta_1$  to  $\beta_6$  are slope parameters and  $\beta_0$  is the intercept. GDPg is economic growth measured by growth rate of GDP measured in percentages. MPR is monetary policy rate measured in percentages, INFR is inflation rate measured in percentages, M2 is broad money, GFCF is Gross fixed capital formation, LFPR is labor force participation rate, and EXCR is exchange rate depreciation. A priori expectations are  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 > 0$ .

### 3.3 Estimation technique

The actual data analysis begins with pre-estimation test, particularly, descriptive statistics, unit root test, and cointegration test. Concerning unit root test, this study adopts the Augmented Dickey Fuller unit root test procedure (with constant and trend) for individual variables to provide evidence on whether the variables are stationary at level, I(0) series or at first difference, I(1) series. From the result of the unit root test, an appropriate estimation technique would be used to examine the long-run effect of the explanatory variables on the dependent variables. Cointegration test is carried out to examine the presence of long run relationship between the variables of the study after which, this study uses an ARDL regression method for regression. The post-estimation tests used in this work are multicollinearity test, autocorrelation test, non-



normality of distribution of the residual test, and robustness test. This study employs time series data for Nigeria over a period of 30 years (1990-2020). The data on the variables of the study are sourced from World banks' World Development Indicator updated in 2021 and Central Bank of Nigeria (CBN) statistical bulletin (2021).

#### **4. Findings and discussion**

##### *4.1 Trend analysis of monetary policy and economic growth variables in Nigeria*

This section presents the trend analysis of monetary policy and economic growth variables in Nigeria. Figure 1 below shows the trend result of exchange rate (EXCH), growth rate of GDP (GDPg), gross fixed capital formation (GFCF), inflation rate (INFL), labour force participation rate (LFPR), monetary growth (M2), and monetary policy rate (MPR).

Figure 1 below shows that all variables of the study exhibited trending pattern in the period under study. Exchange rate EXCH is shown in figure 1 to exhibit a constant trend between year 1990 up to year 2010 when it fell and later rope up. Between 2019 and 2020, naira depreciated sharply reaching the highest for the period under review. Growth rate of GDPg exhibited a negative trending pattern from 1990 to 2000 when it started to rise reaching its peak in 2005 and falling onward. The general characteristic of the variables shows that it exhibits a stochastic trend within the period of the study. Gross fixed capital formation is shown in Figure 1 to exhibit a negative linear trend throughout the period under review. Inflation rate on the other hand is seen to trend. Labour force participation rate (LFPR) exhibited a constant trend between year 1990 up to year 2010 when it fell and later rope up to 2018 M2 also exhibited a positive trend within the study period. Finally monetary policy rate (MPR) is shown in figure 1 to display a positive trend in the period. The trend nature of the study variables is an indication that the variable may be nonstationary as such, there is a need for a formal test to confirm the stationary nature of the variables before using them in regression analysis.

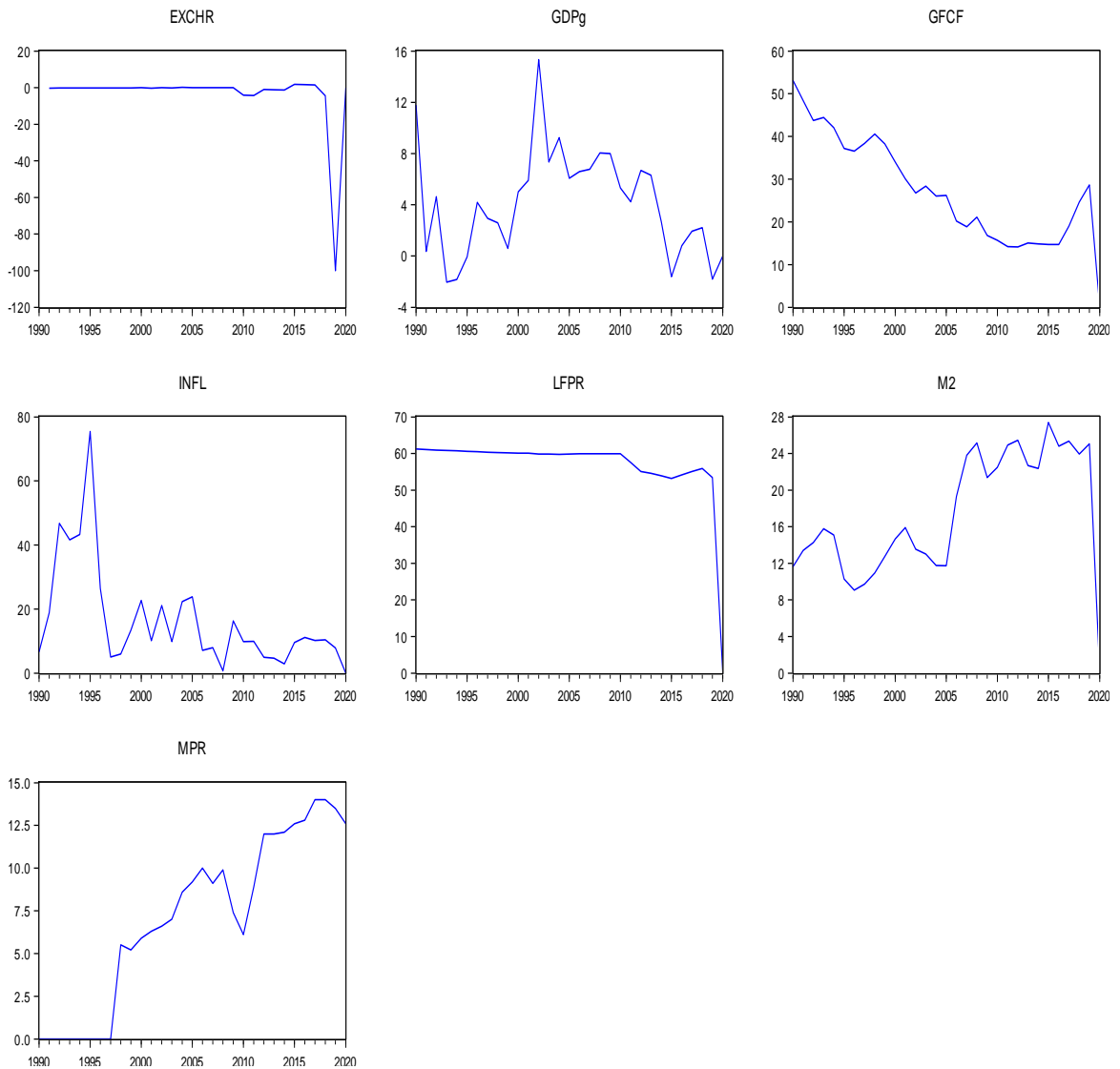


Figure 1. Trend analysis of monetary policy and economic growth variables in Nigeria.

*Explanatory note: In Figure 1, GDPg is growth rate of GDP while, GFCF, EXCH, M2, INFL, LFPR, and MPR are gross fixed capital formation as a percentage of GDP, exchange rate depreciation, growth of money supply, inflation rate, labor force participation rate, and monetary policy rate respectively. Source: Author's Computation, 2022.*

#### 4.2 The summary statistic of monetary policy and economic growth variables in Nigeria

Table 1 presents the summary statistics of GDP growth rate (GDPg), gross fixed capital formation as a percentage of GDP (GFCF), exchange rate depreciation (EXCH), growth of money supply (M2), inflation rate (INFL), labor force participation rate (LFPR), and monetary policy rate (MPR).

Table 1. Summary statistics of monetary policy and economic growth variable in Nigeria

Variable	GDPg	EXCH	GFCF	INFL	LFPR	M2
Mean	4.13	168.12	27.32	16.35	56.73	17.34
Median	4.23	128.65	26.17	10.08	59.91	15.79
Maximum	15.33	520.00	53.12	75.40	61.20	27.38
Minimum	-2.04	8.04	0.00	0.00	0.00	0.00
Std. Dev.	4.13	151.32	12.58	16.21	10.86	6.73
Observations	31	31	31	31	31	31

Explanatory note: In Table 1, GDPg is growth rate of GDP while, GFCF, EXCH, M2, INFL, LFPR, and MPR are gross fixed capital formation as a percentage of GDP, exchange rate depreciation, growth of money supply, inflation rate, labour force participation rate, and monetary policy rate respectively. Source: Author's Computation, 2022.

The results in Table 1 indicate that the average rate of GDP growth over the period of concern is about 4.13 percent with a standard deviation of about 4.13 percent. Maximum values of about 15.33 percent, and minimum value of -2.04 percent. This result shows that the average growth rate of GDP in Nigeria, in this case, 4.13 percent is satisfactory especially, if it is sustainable. On average, the exchange rate in Nigeria within the study period is 168.12 per dollar, with a standard deviation of 151.32. The minimum exchange rate is 8.08 and the maximum exchange rate is 520 Naira per dollar. This result implied that anyone buying from abroad within the study period paid close to 168.2 naira per dollar to get the item. While these values can be as high as 520 naira per dollar, the minimum anyone paid for a dollar is 8.04 naira within the years under study.

Table 1 equally shows that on average, the gross fixed capital formed is 27.32 percent of GDP with a standard deviation of 12.58 percent of GDP. Minimum and maximum gross fixed capital formed within the study period are 0.00 percent and 53.12 percent of GDP respectively. This statistic implies that, while the average capital formed is only about 27.32 percent of GDP, there are periods in which gross fixed capital formation was as low as 0.00 percent of GDP. All in all, the maximum fixed capital formed in any period is only about 53.1 percent of the GDP for that period. The results in Table 1 also indicate that the average rate of inflation in Nigeria over the period of concern is about 16.35 percent with a standard deviation of about 16.21 percent and maximum values of about 75.4 percent, and minimum value of 0.00 percent. This result shows that the average inflation rate in Nigeria is higher than the natural rate of inflation of 3 percent which is necessary for economic growth. The result also shows that inflation is a critical issue of great concern as the inflation rate can reach as high as 75.4 percent which is a case of hyperinflation.

The average rate of labour force participation in economic activities in Nigeria in the period under review is 56.73 percent with a standard deviation of 10.08 percent. The maximum participation rate of the labour force is 61.20 and the minimum participation rate is 0.00 percent. This figure, therefore, implies that on average about 56.73 percent of people of working age are actively involved in the labour force. More so, the statistic shows that while this figure can be as low as 0.00 percent of the labour force, the maximum participation achieved in Nigeria in the study period is 61.2 percent. The average value of growth of money supply for Nigeria over the period of study is 17.34 percent. The standard deviation of the growth of money supply for the sample period is 6.32 percent. The minimum growth of money supply for the period under consideration is 0.00 percent while the maximum growth of money supply for the overall period under consideration is 27.38 percent. This result shows that on average, Nigeria increased its broad money supply by 16.74 percent within the period under consideration. While the result shows that monetary growth can be as low as being negative 0.00 percent, the highest rate at which money supply grew during the period under consideration was 27.38 percent which is economically disastrous, owing to the theoretical relationship between monetary growth and inflation.

### 4.3 Unit root test for monetary policy and economic growth in Nigeria.

This sub-section presents the result of the unit root test conducted on the variable using the Augmented Dickey-Fuller (ADF) approach. Table 2 is a summary of the unit root test result for the variables of the study.

Table 2: Unit root test result of the monetary policy and economic growth in Nigeria

Variable	Level	Prob.	First Difference	Prob.	Remark
EXCH	-1.196	0.893	-5.058***	0.001	I(1)
GDPG	-3.272***	0.090	-	-	I(0)
GFCF	-3.080	0.129	-3.744***	0.036	I(1)
INFL	-2.948	0.164	-3.630***	0.050	I(1)
LFPR	8.613	1.000	-4.476***	0.000	I(1)
M2	-0.881	0.326	-2.500***	0.014	I(1)
MPR	-2.367	0.388	-5.007***	0.002	I(1)

*Explanatory note: In Table 2, GDPg is growth rate of GDP while, GFCF, EXCH, M2, INFL, LFPR, and MPR are gross fixed capital formation as a percentage of GDP, exchange rate depreciation, growth of money supply, inflation rate, labor force participation rate, and monetary policy rate respectively. \*\*\* indicate significance at 10%. Source: Author's Computation, 2022.*

The result of the unit root test conducted on the variables of the study shows that all the variables of the study except the growth rate of GDP are not stationary at level. Table 2 shows that the probability for each of exchange rate (EXCH), gross fixed capital formation (GFCF), inflation rate (INFL), the growth rate of broad money supply (M2), and monetary policy rate (MPR) are 0.893, 0.129, 0.164, 1.00, 0.326, and 0.388 all of which are greater than 0.1 significance level. However, all the variables became stationary after their first difference. This result, therefore, implies that all the variables are integrated of order 1, I(1) series except for the growth rate of GDP which is integrated of order zero, I(0) series. The result in Table 2 poses an important issue, the fact that since this study has a combination of both I(0) and I(1) series, the Johansen cointegration approach for examining the presence of long-run relationship among the variables in a study can no longer be applied. Therefore, to examine the possibility of a long run relationship among the variables in this study, the ARDL bound test approach to cointegration is used.

### 4.4 Cointegration test for monetary policy and economic growth variables in Nigeria.

This sub-section presents the results of the ARDL bound cointegration test for monetary policy and economic growth variables in Nigeria. This approach is necessitated due to the nature of the variables of the study which, in this case, are a combination of I(0) and I(1) series. The equation (8) for ARDL bound test is given as:

$$\Delta GDPg = \gamma_{01} + \gamma_{11}RGDPg_{t-1} + \gamma_{21}MPR_{t-1} + \gamma_{31}M2_{t-1} + \gamma_{41}LFPR_{t-1} + \gamma_{51}GFCF_{t-1} + \gamma_{61}EXCR_{t-1} + \gamma_{71}INFR_{t-1} + \sum_{j=1}^p a_{1j} \Delta GDPg_{t-1} + \sum_{j=1}^{q_1} a_{2j} \Delta MPR_{t-1} + \sum_{k=1}^{q_2} a_{3j} \Delta M2_{t-1} + \sum_{k=1}^{q_3} a_{4j} \Delta LFPR_{t-1} + \sum_{k=1}^{q_4} a_{5j} \Delta GFCF_{t-1} + \sum_{k=1}^{q_5} a_{6j} \Delta EXCR_{t-1} + \sum_{k=1}^{q_6} a_{7j} \Delta INFR_{t-1} + e_{1t} \quad (8).$$

This approach is repeated for each of the variables in the model. The result of the ARDL Bound Test is presented in Table 3 below.

Table 3. ARDL bound test for monetary policy and economic growth variables in Nigeria

Dependent Variable	F-statistics	Remark
GDPG	3.985***	Cointegration
LFPR	1.24	No Cointegration
INF	3.08	No Cointegration
M2	1.53	No Cointegration
MPR	2.61	No Cointegration
GCFC	0.97	No Cointegration
EXCH	7.71***	Cointegration
Lower Bound Critical Value I(0):		
10%	2.12	
5%	2.45	
1%	3.15	
Upper Bound Critical Value I(1):		
10%	3.23	
5%	3.61	
1%	4.43	

*Explanatory note: In Table 3, GDPg is growth rate of GDP while, GCFC, EXCH, M2, INFL, LFPR, and MPR are gross fixed capital formation as a percentage of GDP, exchange rate depreciation, growth of money supply, inflation rate, labour force participation rate, and monetary policy rate respectively.\*\*\* indicate significance at 10%. F-Statistic is the values of F-statistic, I(0) and I(1) are critical value for I(0) bound and I(1) bound, 10%, 5%, 2.5% and 1% are different significant levels. Source: Author's Computation, 2022.*

The bounds test is mainly based on the joint F-statistic. Its asymptotic distribution is non-standard under the null hypothesis of no cointegration. In the ARDL bounds approach, six equations (1, 2, 3, 4 5, 6, and 7) were estimated by ordinary least squares (OLS). The estimation of the five equations tests for the existence of a long-run relationship among the variables by conducting an F-test for the joint significance of the coefficients of the lagged levels of the variables. The first level is calculated on the assumption that all variables included in the ARDL model are integrated of order zero, while the second one is calculated on the assumption that the variables are integrated of order one. The null hypothesis of no cointegration is rejected when the value of the test statistic exceeds the upper critical bounds value, while it is accepted if the F-statistic is lower than the lower bounds value. In other ways, the cointegration test is inconclusive. The calculated F-statistics are reported in Table 3 when each variable is considered as a dependent variable (normalized) in the ARDL regressions. From the results in Table 3, it is clear that there is a long-run relationship amongst the variables when GDPG and EXCH are the dependent variables because it's F-statistic 3.985 and 7.71 are higher than the upper-bound critical value (4.43) at the 10% level. This implies that the null hypothesis of no cointegration among the variables in the equation is rejected. However, for the other equations 2 through equation 6 in Table 3, the null hypothesis of no cointegration is accepted. Thus, from Table 4.4, there is a presence of two cointegrating equations among the variables, as such, we can conclude that the variables in the study share a long-run relationship.

#### 4.5 ARDL Regression result of the impact of monetary policy on economic growth in Nigeria

In this sub-section, we present, interpret and discuss the result from the estimation of Autoregressive Distributed Lag (ARDL) regression model to examine the effect of monetary policy on economic growth in Nigeria. In the model, the growth of GDP (GDPG) is the dependent variable while, the exchange rate (EXCH), the growth of broad money supply (M2), inflation (INFL) gross fixed capital formation (GFCF), labour force participation rate (LFPR), and monetary policy rate (MPR) are the regressors. The result of ARDL regression is presented below in Table 4.

Table 4: Regression results for short run models

Variable	Coefficients	Standard Errors	t-statistics	p-value
GDPg(-1)	0.171	0.171	1.042	0.308
GFCF	-0.342	-0.342	-3.592	0.002***
INFL	-0.022	-0.022	-0.459	0.650
LFPR	0.388	0.388	3.939	0.000***
M2	0.495	0.495	3.394	0.003***
MPR	-0.076	-0.076	-0.843	0.050***
R <sup>2</sup>	0.8353			
Adjusted R <sup>2</sup>	0.7193			
F- statistics	5.554			
Prob(F-stat)	0.001			
DW	1.835			

*Explanatory note: In Table 5, GDPg(-1) one year lag of growth rate of GDP while, GFCF, M2, INFL, LFPR, and MPR are gross fixed capital formation as a percentage of GDP, exchange rate depreciation, growth of money supply, inflation rate, labour force participation rate, and monetary policy rate respectively.\*\*\* indicate significance at 10%. Source: Author's Computation, 2022.*

In Table 4, gross fixed capital formation (GFCF) has a coefficient of -0.342 with a P-value of 0.0015. Since the P-value is less than 0.005 significance level, therefore, GFCF exact a negative and significant impact on economic growth in Nigeria. It means that a percentage point increase in GFCF would cause economic growth to fall by 29.5 percentage point and vice versa. This result negates the a-priori expectation established in Chapter Three. However, this result may come from the fact that fixed capital created (like a plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential) in Nigeria are not based on strong economic considerations. Most of the fixed capitals especially created by the government at all levels are based on political rather than economic consideration, as such, the impact of that capital is, therefore, anti-economic growth. The coefficient of labor force participation rate (LFPR) as shown in Table 4 is 0.388 with a probability value of

0.000. This means that LFPR is a determinant of economic growth in Nigeria, therefore, a percentage point increase in the labor force participation rate in Nigeria will bring about a 26.3 percent points increase in the growth rate of real GDP. This is because, with more people in the labour force, the supply of labour is increased given the availability of other resources, the output will increase leading to the growth of productive capacity of the country and thus, economic growth. This result is supported by extant growth theories and meets our a-priori expectation. This result is similar to what was found in Nwoko, Ihemeje and Anumadu (2016).

Money supply growth (M2) significantly determines economic growth in Nigeria. Table 5 above shows that M2 has a coefficient value of 0.495 with a P-value of 0.003 being less than 0.05 percent significance level. This result indicates that a percentage point increase in M2 will bring economic growth to rise by 39.7 percent points and vice versa. An increase in the supply of money lowers the interest rates in the economy. An increase in the money supply means more money is available for borrowing in the economy, which tends to lower the price for borrowing money. When it is easier to borrow money, rates of consumption and lending (and borrowing) both tend to go up. A higher rate of lending and borrowing can be correlated with an increase in the total output of an economy and therefore, bring about economic growth. This result meets the a-priori expectation of the study. This result is supported by the finding of Chukwu (2009) and Udah (2008).

Monetary policy rate (MPR) as shown in Table 4.5 has a significant and negative influence on economic growth in Nigeria. The coefficient and P-value of MPR as shown in Table 5 are -0.076 and 0.050 percent respectively. Therefore, a percentage point increase in monetary policy rate would cause economic growth to fall by 0.76 percentage points and vice versa. In this regard, a lower rate MPR would stimulate credit expansion in turn, improving output growth and employment. This is because, at low MPR, there is a lower cost of capital which increases investment demand, investment in the real sector, and GDP growth. This finding is supported by studies such as Muhammed, Babawulle, and Tahir, (2021) and Ikeora, Emeka, and Arinze (2019). Lag of GDP Growth (GDPg (-1)): One year lag of growth rate of GDPg in Table 5 has a coefficient value of 0.171. This shows that growth of GDP in the immediate past year has a positive impact on economic growth in the current year. Thus, this result shows that a percentage point growth of GDP in the immediate past year (i.e. year t-1) would cause economic growth in the current year to rise by 0.171 percentage points and vice versa. This implied sustainable growth since growth in the current period will bring about more growth in the next period. This impact of lag of GDPg on economic growth in Nigeria is, however, insignificant since the P-value of coefficient of lag of GDPg being 0.31 is greater than the 0.1 significance level. This result therefore shows that previous growth of GDPg is not a significant determinant of economic growth in the current period in Nigeria.

As shown in Table 4, inflation rate (INFL) has a negative impact on the economic growth. However, the coefficient of INFL as shown above is -0.022 which implies that a percentage point increase in inflation rate (INFL) would cause to fall by 0.022 percentage points and vice versa. This impact of inflation on economic growth in Nigeria is, however, not significant since the P-value of coefficient of inflation 0.650 is greater than the 0.1 significance level. This result therefore shows that inflation is not a significant determinant of economic growth in Nigeria.

Table 5: Regression results for long run models

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCHR	0.018011	0.033435	0.538679	0.5964
GFCF	-0.173065	0.116792	-1.481816	0.1548
INFL	-0.073352	0.049381	-1.485435	0.1538
LFPR	1.461796	0.387698	3.770452	0.0013

M2	-0.206457	0.172112	-1.199545	0.2451
MPR	-0.590956	0.295584	1.999282	0.0601

*Explanatory note: In Table 6, GDPg(-1) one year lag of growth rate of GDP while, GFCF, M2, INFL, LFPR, and MPR are gross fixed capital formation as a percentage of GDP, exchange rate depreciation, growth of money supply, inflation rate, labor force participation rate, and monetary policy rate respectively. \*\*\* indicate significance at 10%. Source: Author's Computation, 2022.*

Under the long run estimate, the result Table 5 shows that Labor Force Participation Rate and Monetary policy rate both have a significant impact on GDP growth rate. In Table 6, a unit increase in LFPR would bring about an increase in GDPg by 1.46 percentage points. This result being positive is in line with the a priori expectation of the study and conforms to relevant theories. Also, in Table 5, MPR has a negative impact on GDPg. The result shows a percentage point increase in MPR cause GDPg to fall by 0.20 percentage point and vice versa.

#### 4.6 Result of diagnostic checks

In this section, the study examines whether the regression model meets up with some basic diagnostic checks. Diagnostic checks examined in this study include normality test, autocorrelation test, heteroskedasticity test, multicollinearity test, and model stability test. The results of these tests are presented in Table 6 below.

Table 6: Result of diagnostic checks

Test	Coefficient	P-Value
Jargue Bera	15.17	0.136
Brausch Pagan Godfrey LM Test for Autocorrelation	0.314	0.581
White Heteroskedasticity	0.217	0.968
RAMSEY Reset Test	T-Statistic 0.023	0.868
	F-Statistic 1.685	0.868
VIF		
GDPg (-1)	1.658	
GFCF	4.580	
INFL	2.295	
LFPR	4.242	
M2	3.505	
MPR	4.743	

*Explanatory note: In Table 6, GDPg is growth rate of GDP while, GFCF, M2, INFL, LFPR, and MPR are gross fixed capital formation as a percentage of GDP, exchange rate depreciation, growth of money supply, inflation rate, labor force participation rate, and monetary policy rate respectively.*

Brausch Pagan Godfrey's test for heteroskedasticity is based on the null hypothesis that the error variances are all equal. The alternate hypothesis is that the error variances are not equal. More specifically, as Y increases, the variances increase (or decrease). A small chi-square value (along with an associated small p-value) indicates the null hypothesis is true, that is, the variances are all equal. The result of the Brausch Pagan Godfrey test presented in Table 6 above shows an F-statistic of 0.217 with a P-value of 0.968. Since the P-value is greater than the 0.05 significance level, we reject the null hypothesis and conclude that error variances are unequally distributed. The result of the residual normality test is presented



in Table 6 using the Jargue Bera normality test. The result in Table 6 shows Jargue Bera has a coefficient of 15.3 with a P-value of 0.136. Since Jargue Bera has a P-value that is greater than 0.05, in conformity with the rule of thumb guiding the use of Jargue Bera for testing residual normality, this study rejects the null hypothesis of residual non-normality and concludes that the residuals from the regression model are normal.

Brausch Pagan Godfrey LM Test for serial correlation is used in this study. Based on the null hypothesis the error terms in a time series are correlated with one another. The alternate hypothesis is that the error term is uncorrelated. From Table 6 above, the Brausch Pagan Godfrey LM Test for serial correlation has a test statistic of 0.314 and a P-value of 0.581 which is not significant at a 0.05 significance level. Therefore, based on the test result, this study rejects the null hypothesis of autocorrelation and conclude that error term in successive periods is not correlated. This study used the Variance inflation factor approach to test for multicollinearity. The result of VIF is shown in Table 6 above, none of the VIF values is above 5.0, therefore, based on a general rule, we can conclude that none of the variances between the independent variables is highly inflated, and thus, there is no strong correlation among the independent variables that may warrant dropping one of the independent variables. Ramsey Reset test is used to test for model specification error in the study. RESET stands for Regression Specification Error Test. Output from the test reports the test regression and the F-statistic and log-likelihood ratio for testing the hypothesis that the coefficients on the powers of fitted values are all zero. The result of the RAMSEY test presented in Table 6 shows an F statistic of 1.685 and a P-value of 0.898. Since the F statistic is not significant, we reject the null hypothesis and conclude that there is no specification error in the model.

## 5. Conclusion

Monetary policy is a deliberate action of the monetary authorities to influence the quantity, cost, and availability of money credit to achieve desired macroeconomic objectives of internal and external balances (CBN, 2011). The CBN stated its objectives as ensuring price stability and economic growth. Thus, the CBN has over the years, embarked on different monetary policies aimed at ensuring sustained economic growth. One of these policies involves varying the monetary policy rate (MPR) in response to the needs of the Nigerian economy. Therefore, given the imperativeness of ensuring economic growth and the role that monetary policy has to play in the growth process, it is important to examine how monetary policy has facilitated economic growth in Nigeria. To achieve the above objective, this study followed the neoclassical growth model of the Solow-Swan (1956) type and used a model where the growth rate of real GDP is given to be a regress and of some control variables (i. e. gross fixed capital formation, exchange rate depreciation, growth of broad money supply, labour force participation rate) and the monetary policy rate (MPR) as the monetary policy variable. Using annual data sourced from the World Development Indicator and Central Bank of Nigeria for a period between 1990 and 2020. This study employed the Autoregressive Distributed Lag regression approach to estimate the impact of monetary policy on economic growth in Nigeria. This is done after careful examination of the stationarity nature of the data and the possibility of cointegration. Based on the application of the above methodology, the highlights of the findings are: the coefficient of gross fixed capital formation is negative and significant, the coefficient of labour force participation rate is positive and significant in the study, the coefficient of money growth is positive and significant in the study, the coefficient of monetary policy rate (MPR) is negative and significant in the study, the coefficient of lag of growth rate of GDP ( $GDPg(-1)$ ) is positive and insignificant in the study, and the coefficient of inflation rate (INFL) is negative and insignificant in the study.

The findings of the study suggest that gross fixed capital formation has a negative impact on economic growth in the study. Labour force participation rate has a positive impact on economic growth in the study, while money growth has a positive impact on economic growth and monetary policy rate (MPR) has a negative impact on economic growth in the study. The overall conclusion emanating from the above is that gross fixed capital formation, labour force participation rate, money growth, and monetary policy are determinants of economic growth in Nigeria.

In line with the findings of this study, gross fixed capital formation has not been found to have a negative effect on economic growth in Nigeria. It is recommended that a strong policy guiding the choice, initiation, and execution of projects that focus on economic viability and value addition should be implemented for public projects in Nigeria. More so, guidelines should be provided for private investors on the need to prioritize investment funding based on the economic viability. Similarly, based on the findings the labour force participation rate improves the rate of economic growth in Nigeria. It is recommended that the government should create an enabling environment so that jobs can be increased as this will increase the labour force participation rate in Nigeria. The government can set up skills acquisition funds to train people in entrepreneurship and technical skills so that they can be equipped to participate fully in the labour force as this will improve the growth of the economy. Also, given that monetary growth was found to have a positive effect impact on inflation, monetary authorities in West Africa should be committed to a policy of monetary rule where money is only allowed to grow at a constant rate proportionate to the output growth rate in order to control inflation caused by excess money growth. Finally, given that monetary policy rate (MPR) has a negative impact on economic growth in Nigeria, it is therefore recommended that monetary authorities should employ careful management of the monetary policy rate that would facilitate investment in the real sectors to improve the economic growth. In general, this study calls for a renewed commitment to the conduct of monetary policy in Nigeria and strategies that will facilitate investment in real sectors of the Nigerian economy. This will improve the economic growth and further strengthen the effectiveness of monetary policy in Nigeria.

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### Authors' contributions

The research conceptualization, resources gathering, drafting and data collection was carried out by Mr Abdulkareem while, the research area covered by Dauda are project administration, investigation, methodology, analysis, supervision, and validation.



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