

EFFECT OF MONETARY POLICY ON ECONOMIC GROWTH IN NIGERIA (1990-2021)

BY

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Abstract

Many countries, especially developing ones, prioritize RGDP growth. Economic growth reduces poverty and improves welfare, so its determinants must be identified. Despite studies on economic growth's determinants, Nigeria's economy remains stagnant. This narrative inspired the present study, which examined how monetary policy affects Nigerian economic growth. Thus, this study examined Nigeria's economic growth and monetary policy. The study used 1990–2021 time series data. The Augmented Dickey-Fuller test and ARDL bond test were used to test the data's stationary nature and long-run relationships. The short-run regression conducted using the 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 policies significantly affect economic growth in Nigeria. It thus recommends that policymakers embark on a renewed commitment to the conduct of monetary policy in such a way as to increase economic growth in Nigeria.

Keywords: Economic growth; MPR; Augmented Dickey-Fuller; ARDL; Bond Testing Cointegration Test

Introduction

Over the years, the main focus of monetary policy has been economic growth, one of any nation's macroeconomic goals. Price stability and sustainable economic growth are the Central Bank of Nigeria's (CBN) top priorities for its monetary policy (CBN, 2017). More specifically, Nigeria's succeeding administration has implemented measures meant to promote sustained economic growth (Nwoko, Ihemeje, and Anumadu, 2016). Nigeria, frequently referred to as the powerhouse of Africa, has struggled to achieve sustainable economic growth throughout the years. Since 2011, Nigeria's economy has grown steadily, averaging 2.59 percent per year (World Bank, 2021), reaching a record high of 6.88 percent in the first quarter of 2011. However, in 2020, the economy of Nigeria contracted by 1.8%, the most since 1983, but growth resumed in 2021 as pandemic restrictions were relaxed and oil prices increased (World Bank, 2021). The Central Bank of Nigeria reduced the policy rate by 100 basis points to 11.5% in reaction to the pandemic's effects in an effort to support a struggling economy. The fiscal deficit increased from 4.3% in 2019 to 5.2% in 2020, primarily due to domestic and foreign borrowing, as a result of pandemic-related spending pressures and revenue deficits (AfDB, 2021).

The stability of economic growth is one of the primary goals of monetary policy in Nigeria. The Nigerian government has implemented a number of monetary policies over time to promote economic growth. It is important to draw attention to Nigeria's monetary policy and consider how much it has aided in the expansion of the country's economy (Nwoko et al, 2016). In order to have a stable price, monetary policy is either contracted or expanded in Nigeria, but evidently, the reported growth has not been a sustainable one as there is evidence of increased poverty among the populace. The question is, does monetary policy have any effect on economic growth? Does other factor such as labour participation rate, exchange rate, gross fixed capital formation promote growth more than monetary policy? These are the questions which this study would attempt to answer.

Theoretically, no country can grow without capital and labor. Empirically, studies examining the impact of monetary policy on economic growth in Nigeria have reported dissimilar results. Most of these studies focus on GDP as a proxy for economic growth, rather than the growth of GDP. This study hopes to fill this gap by employing a measure of capital and labour as determinants of economic growth.

Literature Review

Theoretical and empirical research has examined how monetary policy affects economic growth. This paper divides theories into economic growth and monetary policy theories. Monetary policy theories

include classical, Keynesian, and monetarist. Economic growth theories include classical, Keynesian, and endogenous. Neo-classical growth theory states that labour, capital, and technology—particularly technological advancements—affect economic growth. The theory assumes a constant marginal product of capital, unlike endogenous growth theory, which assumes a decreasing marginal product. Milton Friedman's 1967 monetarist theory emphasizes the money supply's role in the economy. Several studies have examined the effect of monetary policy on economic growth in Nigeria and other countries. A study by Nwoko, Ihemeje, and Anumadu (2016) investigated the effectiveness of the Central Bank of Nigeria's monetary policies in fostering economic growth throughout the years 1990–2011. Multiple regression models were used to examine the effects of money supply, average price, interest rate, and the labour force on GDP.

Amiri and Ganye (2018) analysed how monetary policy has affected American economic growth using data from 1970 to 2016. The results show that monetary policy affects economic growth in the short-, medium-, and long-term. Over the short, medium, and long term, interest rates have a positive, negative, growing, and decreasing impact on economic growth. Ayodeji and Oluwole (2018) examined the impact of monetary policy on economic growth in Nigeria. Money Supply, Exchange Rate, Interest Rate, and Liquidity Ratio were examined. Granger causality test was done on the variables and the results showed the existence of a uni-directional causality between money supply and economic growth. An analysis by Muhammed, Babawulle, and Tahir (2021) shows that while inflation is negatively impacted by monetary policy, GDP growth is positively impacted. This analysis involved using the Augmented Dickey-Fuller unit root test, the Vector error correction mechanism, and the Ordinary Least Squares approach. The authors, Sena, Asante, and Brafu-Insaidoo (2021), examined the relationship between monetary policy and economic growth from 1980 to 2016. According to the research, Ghana's financial development strengthens the influence of central bank monetary policy.

In all, Amiri & Ganye (2018); Sena, Asante & Brafu-Insaidoo (2021) are studies beyond Nigeria while country-specific (Nigeria) studies are, Nwoko, Ihemeje, and Anumadu (2016), Ayodeji and Oluwole (2018), Ikeora, Emeka, & Arinze (2019), Muhammed, Babawulle, & Tahir (2021). While some studies report a positive effect of monetary policy on growth, other studies reported a negative effect on economic growth. There is a substantial relationship between Treasury Bills, liquidity, and monetary policy rates and Nigeria's GDP. While inflation is negatively impacted by monetary policy as represented by money supply, GDP growth is positively impacted. In Nigeria, almost all studies focus on GDP as a proxy for economic growth. This study hopes to fill this gap by employing a measure of capital and labor as determinants of economic growth in present study. Theory suggests that it is the rate of exchange rate depreciation and growth of money supply that affects growth.

Methodology

The theoretical foundations of growth of GDP per capita equation (economic growth) can be found in the neoclassical growth model which is widely used in empirical studies. Hence, this study adopts the neo-classical growth model of Solow-Swan (1956) as the theoretical framework.

$$Y = Af(L,K) \dots\dots\dots(1) \text{ where:}$$

Y stands for output (GDP), K for investment, L for labour, and A for all-factor productivity (TFP).

The level of economic output is determined by the factors of production in the economy, simulating a straightforward production function. This can be summed up as:

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

The study consider a production function of the Cobb-Douglas type that is defined as follows: where K represents capital, Y represents economic growth, and L represents labour (measured by total labour force participation rate), and GDP is measured as a function of output per capita.

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

Linearizing equation (3), it becomes:

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

The study seeks to understand the effects of monetary policy on economic growth through this A. A is the parameter that captures the influence of other production factors, while L and K are as previously defined. As a result, the study describes the model with additional control variables.

Model Specification

In this article, the study examine how the neoclassical growth model in Equation 4 can be transformed into an econometric model of economic growth by adding time and country subscripts (t and i) and the stochastic error term (U) to it.

$$Y_t = \beta_0 + \beta_1 GFCF + \beta_2 LFPR + \beta_3 MPR + \beta_4 EXC + \beta_5 M_2 + \beta_6 INF + \mu_t \dots \dots (5)$$

where

Y = economic growth measured by the growth rate of GDP measured in percentage

MPR= monetary policy rate measured in percentage, INF = inflation rate measured in percentage

M₂= broad money, GFCF= Gross fixed capital formation, LFPR= labor force participation rate, and,

EXC= Exchange rate depreciation

t subscripts= year subscripts.

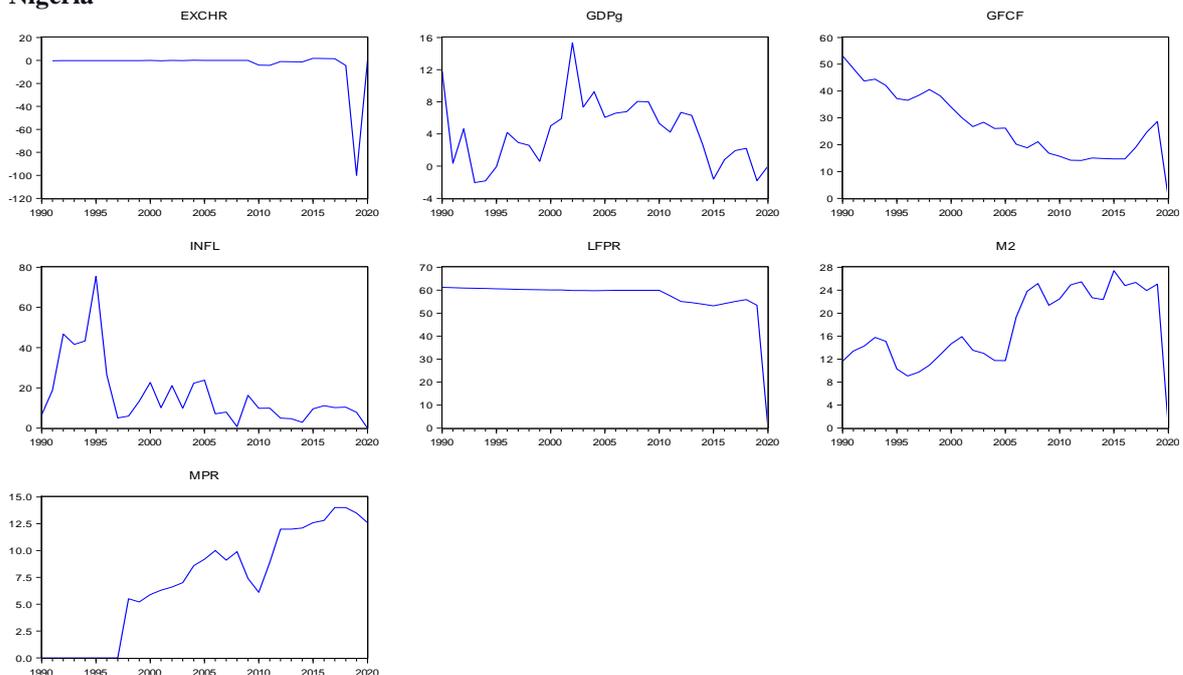
$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5,$ and β_6 represent parameters to be estimated. U_t = Stochastic error term.

Results and Discussion

Trend Analysis

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

Figure 1: Trend Analysis of Monetary Policy and Economic Growth variables in Nigeria



Source: Author’s Computation, 2022.

Between 2019 and 2020, the naira depreciated sharply reaching the highest for the period under review. Growth rate of GDPg exhibited a negative trending pattern from 1990 until 2000 when it started to raise reaching its peak in 2005 and falling onward. Exchange rate EXCH is shown in figure 1 to exhibit a constant trend between the year 1990 to the year 2010 when it fell and later rope up. The general characteristic of the variables shows that it exhibits a stochastic trend.

Descriptive Statistics

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: Descriptive statistics

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

Source: Author's Computation, 2022.

On average, the gross fixed capital formed in any period is only 27.32 percent of the GDP. 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.

Nigeria's inflation rate can reach as high as 75.4 percent which is a case of hyperinflation. The average rate of growth of money supply for Nigeria over the period of study is 17.34 percent. This result shows that on average, Nigeria increased its broad money supply by 16.74 percent.

Correlation Analysis

Table 2 below is used to present the pairwise correlation matrix to show the relationships that exist among the variables used in the models.

Table 2: Correlation Matrix of Monetary Policy and Economic growth Variables

VARIABLE	EXCH	GDPG	GFCF	INFL	LFPR	M2	MPR
EXCH	1.00						
GDPg	-0.27	1.00					
GFCF	-0.75	-0.06	1.00				
INFL	-0.47	-0.23	0.49	1.00			
LFPR	-0.62	0.25	0.54	0.28	1.00		
M2	0.40	-0.04	-0.43	-0.32	0.30	1.00	
MPR	0.87	0.01	-0.83	-0.61	-0.39	0.578	1.00

Source: Author's Computation, 2022.

The exchange rate (EXCH) has a correlation coefficient that is positive with each growth of broad money (M2) and monetary policy rate (MPR) and negatively correlated with of growth of GDP (GDPg), gross fixed capital formation (GFCF), inflation rate (INFL), and labor force participation rate (LFPR) in the study. Table 2 shows the linear association between growth GDP (GDPg) and each labor force participation rate (LFPR) and monetary policy rate (MPR) in the study. It also shows that gross fixed capital formation (GFCF) has a positive correlation coefficient with each of the inflation rate (INFL) and growth of broad money supply (M2). Inflation rate (INFL) is seen to have a positive correlation coefficient with each of the labor force participation rate (LFPR), growth of broad money supply (M2), and monetary policy rate (MPR) This means that an increase in any one of them is associated with a increase in the other and vice versa.

Unit Root Test

This sub-section presents the result of the unit root test conducted on the variable using the Augmented Dickey-Fuller (ADF) approach. Table 3 is a summary of the unit root test result for the variables of the study.

Table 3 Unit Root Test Result

S/N	VARIABLE	LEVEL	PROB	FIRST DIFFERENCE		REMARK
		VALUE		VALUE	PROB	
1.	EXCH	-1.196	0.893	-5.058***	0.001	I(1)SERIES
2.	GDPG	-3.272***	0.090			I(0)SERIES
3.	GFCF	-3.080	0.129	-3.744***	0.036	I(1)SERIES
4.	INFL	-2.948	0.164	-3.630***	0.050	I(1)SERIES
5.	LFPR	8.613	1.000	-4.476***	0.000	I(1)SERIES
6.	M2	-0.881	0.326	-2.500***	0.014	I(1)SERIES
7.	MPR	-2.367	0.388	-5.007***	0.002	I(1)SERIES

Source: Author's Computation, 2022.

Table 4.3 shows that the probability for each exchange rate (EXCH), gross fixed capital formation (GFCF), inflation rate (INFL), growth rate of broad money supply (M2) and monetary policy rate (MPR) are greater than 0.1 significance level. This result, therefore, implies that all the variables are integrated of order 1, I(1) series.

Cointegration Test

This 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.

Table 4: ARDL Bond Test

DEPENDENT VARIABLE	F-STATISTIC	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
GFCF	0.97	No Cointegration
EXCH	7.71	Cointegration
UPPER BOND CRITICAL VALUE:		
10%		2.12
5%		2.45
1%		3.15
LOWER BOND CRITICAL VALUE:		
10%		3.23
5%		3.61
1%		4.43

Source: Author's computation, 2022

When GDPG and EXCH are the dependent variables, there is a long-term association between the variables because their F-statistics of 3.985 and 7.71 are higher than the upper-bound critical value (4.43) at the 10% level. This suggests that the null hypothesis that there is no cointegration among the equation's variables is false.

The Regression Result

This section is divided into 2 sub-sections. The first sub-section is the result of ARDL regression while the second section is the diagnostic result.

4.2.1 ARDL Regression Result

The study presents the results of the estimation of the Autoregressive Distributed Lag (ARDL) regression model to look at how Nigeria's monetary policy affects economic growth. In the model, the labour force participation rate (LFPR), the exchange rate (EXCH), the growth of the broad money supply (M2), inflation (INFL), and the monetary policy rate (MPR) are the regressors.

VARIABLE	COEFFICIENT	STD-ERROR	T-STATISTICS	P-VALUE
GDPg(-1)	0.171	0.164	1.042	0.308
GFCF	-0.342	0.095	-3.592	0.002***
INFL	-0.022	0.049	-0.459	0.650
LFPR	0.388	0.099	3.939	0.000***

M2	0.495	0.146	3.394	0.003***	Table 5: ARDL Regression Result
MPR	-0.076	0.035	-0.843	0.050***	
R ²	0.8353				
ADJUSTEDR ²	0.7193				
F- STATISTIC	5.554				
PROB(F- STAT)	0.001				
DW					
	1.835				

Source: Author's Computation, 2022.

Gross Fixed Capital Formation (GFCF) has a coefficient of -0.342 and a P-value of 0.0015. A percentage point rise in GFCF would result in a 29.5 percentage point decline in economic growth. This result contradicts the a priori expectation set out in Section 3 Three. A percentage point increase in the labour force participation rate in Nigeria will result in a 26.3 percent point rise in the growth rate of real GDP. This finding complies with our a priori anticipation as stated in Chapter Three and is supported by current growth theories. It is comparable to that discovered in Nwoko, Ihemeje, and Anumadu (2016). Growth in the money supply (M2) has a substantial impact on Nigeria's economic expansion. A percentage point increase in M2 will cause an increase in economic growth of 39.7 percentage points. Findings from Chuckwu (2009) and Udah (2010) support this outcome. Table 5 shows that the monetary policy rate (MPR) has a considerable and unfavourable impact on economic growth in Nigeria. According to Table 5, the MPR coefficient and P-value are -0.076 and 0.050 percent, respectively. A lower MPR would encourage the expansion of credit, which would therefore improve production growth and employment. Nigeria's economy grows by 0.171 percentage points for every percentage point growth in GDP in the most recent year (i.e., year t-1) and vice versa. The effect of lag of GDPg on economic growth in Nigeria is minor, according to the OECD.

Table 5 shows that the inflation rate's (INFL) adverse effect on economic growth. However, the coefficient of INFL, as depicted above, is -0.022, suggesting that inflation in Nigeria is not a significant factor in determining economy's growth. The P-value of the inflation coefficient's 0.650 is bigger than the 0.1 level of significance, hence the finding is not statistically significant.

Result of Diagnostic Checks

The study evaluates if the regression model passes a few fundamental diagnostic tests in this subsection. This study's diagnostic checks included a normality test, an autocorrelation test, a heteroskedasticity test, a multicollinearity test, and a test for model stability. The following Table 6 lists the outcomes of various examinations.

Table 6: Result of Diagnostic Tests

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
Variance Inflation Factor		
GDPG(-1)	1.658	
GCFC	4.580	
INFL	2.295	
LFPR	4.242	
M2	3.505	
MPR	4.743	

Table 6 displays the outcome of the Brausch Pagan Godfrey test. The null hypothesis is confirmed by a low chi-square value and a low p-value. The study come to the conclusion that error variances are not

evenly distributed because the P-value is higher than the 0.05 significance level. The Jarque Bera normality test has a P-value that is greater than 0.05, in accordance with the general rule of thumb for testing residual normality. Instead, it finds that the residuals from the regression model are normal. The study's findings are shown in Table 6. The study used the Breusch Pagan Godfrey LM Test for serial correlation. This analysis rejects the null hypothesis of autocorrelation and concludes that error terms in subsequent periods are not associated based on the test result. The possibility that the error term is uncorrelated is the alternative theory. The Variance Inflation Factor (VIF) method was employed in this work to check for multicollinearity. None of the VIF values are above 5.0, so as a rule, none of the variances between the independent variables are significantly inflated. There is no specification error in the model because the F statistic is not significant. Table 6's presentation of the results of the RAMSEY test displays a F statistic of 1.685 and a P-value of 0.898. The test's output includes the test regression, F-statistic, and log-likelihood ratio.

Conclusion and Policy Recommendations

The purpose of monetary policy is to alter the amount, cost, and accessibility of money credit to create desired macroeconomic balances for both the internal and foreign markets. The Central Bank of Nigeria (CBN), has implemented a variety of monetary policies over the years to ensure price stability and economic growth. Nigeria's Monetary Policy Rate (MPR) and the growth rate of real GDP is given as a regress, along with some control variables (such as gross fixed capital formation, exchange rate depreciation, growth of broad money supply, and labour force participation rate) Using annual data for the years 1990 through 2021 taken from the World Development Indicator and the Central Bank of Nigeria.

In line with the findings of this study, the following recommendations are made:

(i) In view of the fact that gross fixed capital formation was found to have a negative effect on economic growth in Nigeria, Nigeria needs a strong policy guiding the choice, initiation, and execution of public sector projects that focus on economic viability and value addition. More so, guidelines may be provided for private investors on the need to prioritize investment funding based upon economic viability.

(ii) Based on the finding that the labour force participation rate improves the rate of economic growth in Nigeria, it is recommended that government should set up a fund to train people in needed entrepreneurship and technical skill so that they can participate fully in the labor force.

(iii) Given that monetary growth was found to have a positive effect impact on inflation, monetary authorities in Nigeria 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.

(iv) Monetary policy rate (MPR) retard economic growth in Nigeria, this study recommended that, given the Nigerian economic environment, monetary authorities should employ careful management of the monetary policy rate that would facilitate investment in the real sector and improve economic growth.

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