

The Effects of Monetary Policies on Economic Growth in Nigeria

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Abstract

The study investigated the effects of monetary and fiscal policies on economic growth in Nigeria using various economic variables. The findings showed that gross capital formation, total number of employees, broad money supply, and lending interest rate are significant factors in determining economic growth in Nigeria. The study found that gross capital formation, total number of employees, and broad money supply have a positive and significant effect on gross domestic product (GDP), while lending interest rate has a negative and significant effect on GDP. The study recommended that the government should encourage more private investment in Nigeria by lowering the lending interest rate, which would lead to more borrowing by private investors and boost investment in the country. The study also recommended that government policies should be tailored towards creating more employment in Nigeria as this can lead to economic growth. Finally, the study concluded that monetary policy is more effective than fiscal policy in Nigeria, and the monetary authority should be sensitive in directing its policies to the sector that can propel economic growth. The study suggests that the monetary authority could use an expansionary monetary policy to reduce interest rates and encourage more investment, which would stimulate economic growth in Nigeria.

Keywords: Fiscal Policy; Monetary Policy; GDP; ECM

JEL Classification Codes: H00, H10, H20, E52, O40

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1. Introduction

Fiscal and monetary policies are both commonly used to stabilize the macroeconomic conditions of a country (Abata *et al.*, 2012). Monetary policy refers to the actions taken by a country's central bank to regulate the supply of money and credit in the economy, with the aim of achieving macroeconomic objectives such as price stability, output growth, and full employment (CBN, 2011). On the other hand, fiscal policy is the use of government spending, taxation, and borrowing to influence the economic activities of a country in order to achieve macroeconomic objectives such as full employment, price stability, and output growth (Adeniyi *et al.*, 2020).

Monetary policy is primarily implemented by the central bank, while fiscal policy is implemented by the Ministry of Finance or Treasury. Although monetary and fiscal policies have the same objective of promoting high, stable, and sustainable economic growth, they use different instruments to achieve this goal. However, both policies can complement each other in achieving macroeconomic stability (Adigwe *et al.*, 2015). In many countries, monetary policy has historically played a supporting role to fiscal policy, and central banks have often been required to finance public sector deficits. This is often due to the fact that fiscal policy is typically more responsive and flexible than monetary policy, making it more effective in addressing short-term economic challenges (Edeme *et al.*, 2018). However, in recent years there has been a trend towards increasing central bank independence, which has created more opportunities for monetary policy and fiscal policy to complement each other. This has involved giving central banks more autonomy to set their own policy goals and instruments, as well as reducing the extent to which central banks are required to finance public sector deficits. Fiscal policy can affect the effectiveness of monetary policy in various ways. For example, fiscal policy actions can impact the general price level, which can cast doubts on the efficacy of monetary policy. Fiscal policy can also impact aggregate demand in the short run, which can affect the effectiveness of monetary policy in achieving macroeconomic stability. In addition, fiscal policy can modify the long-term conditions for economic growth and inflation, which can affect the effectiveness of monetary policy in achieving its objectives (Alabi and Olarinde, 2020).

Monetary and fiscal policies may complement or offset each other. Fiscal policy actions can impact monetary policy through their effects on the general price level, aggregate demand, and long-term economic growth and inflation. In response to expansionary fiscal policy, the central bank may tighten monetary policy to control inflation by raising interest rates or reducing credit in the financial system (Ezeaku *et al.*, 2020). However, high interest rates may harm macroeconomic and financial stability. Effective monetary and fiscal policies require coordination between the respective authorities because the success of one policy depends on the other. Thus, while these policies are implemented by different bodies, they are far from independent and a change in one policy will affect the effectiveness of the other and the overall impact of policy changes on the economy (Ogundipe and Akinbobola, 2020).

The relative importance of fiscal and monetary policies is a matter of debate, with some economists arguing that monetary policy has a greater impact on economic activity, while others argue that fiscal policy is more effective. Keynesians believe that fiscal policy is more effective in stimulating aggregate demand and reducing unemployment, while monetarists argue that monetary policy is more effective in promoting economic growth (Okorie *et al.*, 2017). The real wealth effect describes how changes in the price level affect consumer spending, as assets gain or lose purchasing power. Arthur Cecil Pigou argued that Keynes' General Theory did not sufficiently

account for the role of the "wealth effect" on consumption, which would make the economy more "self-correcting" to drops in aggregate demand (Mogaji *et al.*, 2020).

Developing economies face challenges of growth, stability, and structural transformation, which have not been adequately addressed by fiscal and monetary policies (Bodunrin, 2016). These economies are often vulnerable to external shocks and internal destabilizations, resulting in high levels of unemployment, low income, inequality, and poverty. The Nigerian economy is particularly volatile due to its dependence on oil revenue, and experiences instability through rising inflation, massive unemployment, low output, and dwindling foreign reserves, leading to unstable exchange rates (Nwaogwugwu, 2018).

From 1990 to 2020, Nigeria has implemented various monetary and fiscal policies in response to different economic challenges. In the early 1990s, the country faced a severe economic crisis due to declining oil prices, which led to high inflation, currency devaluation, and a balance of payments crisis (Adeniyi *et al.*, 2020). To address these challenges, the government adopted a Structural Adjustment Program (SAP), which included monetary and fiscal policies aimed at reducing inflation and stabilizing the economy. During the 2000s, Nigeria experienced a period of sustained economic growth, which was supported by prudent monetary and fiscal policies. The Central Bank of Nigeria (CBN) adopted an inflation targeting framework in 2006, which aimed to maintain inflation within a target range of 6-9%. The government also implemented fiscal policies to support economic growth, such as increased public spending on infrastructure and social services (Alabi and Olarinde, 2020).

Also, the country has also faced various economic challenges during this period, such as the global financial crisis of 2008 and 2009, which led to a decline in oil prices and reduced government revenues. In response, the government implemented expansionary fiscal policies, such as increased public spending and borrowing, which led to a rise in public debt. In recent years, the government has implemented various reforms aimed at improving the effectiveness of monetary and fiscal policies (Ezeaku *et al.*, 2020). The CBN has introduced several measures to enhance financial stability, such as the introduction of a cashless policy, the development of a credit reporting system, and the establishment of a regulatory framework for mobile money services. The government has also implemented fiscal reforms, such as the introduction of a Treasury Single Account (TSA) to improve transparency and accountability in public financial management (Mogaji *et al.*, 2020).

However, Nigeria continues to face various economic challenges, such as high inflation, low productivity, and high unemployment. The government and the CBN have implemented various policies to address these challenges, such as the adoption of a flexible exchange rate regime, the introduction of a loan-to-deposit ratio (LDR) policy to boost lending to the real sector, and the establishment of an infrastructure development fund to finance critical infrastructure projects (Ogundipe and Akinbobola, 2020). The question arising from the above discussion is that which of the policies matter for economic growth in Nigeria? Based on this, the study is set to investigate the effects of fiscal and monetary policies in Nigeria by looking at the contribution of fiscal policy on economic growth in Nigeria and also the contribution of fiscal policy on economic growth in Nigeria. The rest of the study is organized into four sections. Section two covers the literature review and section three is on methodology. Section four focused on empirical analysis and the section five deals with summary and conclusion.

2. Literature Review

Several arguments regarding the effectiveness of fiscal and monetary policy stances differ across countries and over time. Various studies have been conducted in this area. For example, Chuku (2010) used quarterly data to investigate the monetary and fiscal policy interactions in Nigeria from 1970 to 2008. The study found that there was a non-Ricardian fiscal policy in Nigeria. The evidence revealed that monetary and fiscal policies in Nigeria have interacted in a counteractive manner for most of the sample period (1980-1994). However, there was no systematic pattern of interaction between the two policy variables during other periods, although between 1998 and 2008, some form of accommodativeness was observed. The results suggested that the two policy regimes (counteractive and accommodative) have been weak strategic substitutes during the post-1970 (Civil War) period. The study results implied the existence of fiscal dominance in the interactions between monetary and fiscal policies in Nigeria. Inflation predominantly results from fiscal problems, rather than a lack of monetary control, indicating that policy makers need to focus on solving fiscal indiscipline.

Also, Abata *et al.* (2012) analyzed the impact of fiscal and monetary policies on economic growth and development in Nigeria. The study identified the problem of fiscal indiscipline as one of the major challenges to achieving sustainable economic growth in Nigeria. The study concluded that the effectiveness of fiscal and monetary policies on economic growth in Nigeria can only be achieved through proper coordination and implementation of these policies, as well as the need for strong political will to address the issue of fiscal indiscipline in Nigeria. Ogar *et al.* (2014) conducted a study to examine the relationship between fiscal and monetary policies and economic growth in Nigeria from 1986 to 2010. The study found that both government revenue and money supply had a positive and statistically significant impact on gross domestic product. Noman and Khudri (2015) conducted a study on the impact of fiscal and monetary policies on economic growth in Bangladesh, from 1979-80 to 2012-13. The research found that there was a positive correlation between narrow money, broad money, exchange rate, government revenue, and expenditure with real gross domestic product. This implies that an increase in these variables will result in a corresponding increase in the real gross domestic product.

Agu *et al.* (2015) determined the impact of various components of fiscal policy on the Nigerian economy. The study found some evidence of a positive correlation between government expenditure on economic services and economic growth. However, the study did not find significant evidence of the impact of other components of fiscal policy, such as government expenditure on social services or transfer payments, on economic growth in Nigeria. Overall, the study suggested that the impact of fiscal policy on economic growth in Nigeria may be limited, and further research is needed to explore the effectiveness of different fiscal policy components in driving sustainable economic growth in the country. Also, Adigwe *et al.* (2015) investigated the impact of monetary policy on the Nigerian economy between 1980 and 2010. The study found that monetary policy, as represented by money supply, had a positive impact on GDP growth. However, the same monetary policy had a negative impact on the rate of inflation. This implies that the effectiveness of monetary policy in Nigeria is dependent on the specific macroeconomic variables being targeted. Specifically, increasing money supply can stimulate economic growth but may also lead to inflationary pressures.

Furthermore, Bodunrin (2016) examined the influence of fiscal and monetary policy on the economic growth of Nigeria between 1981 and 2015. The objective was to determine which of the

policies between fiscal and monetary had a more significant impact on the economic growth of Nigeria and to investigate how GDP growth reacted to the shocks caused by monetary and fiscal policies. Using the VAR model, the study revealed that fiscal policy had a short-term impact on real GDP growth, which, however, faded away after one year. On the other hand, the study found that monetary policy had no significant impact on the growth of real GDP in Nigeria. Ajayi and Aluko (2016) evaluated the relative impact of monetary and fiscal policy in Nigeria from 1986 to 2014 using a modified St. Louis equation. The study revealed that growth in money supply and export have a positive and significant effect on growth in output of the economy, while growth in government expenditure has a negative and insignificant effect. The study suggests that a well-coordinated monetary policy that emphasizes increasing money supply and controlling inflation will have a more significant impact on economic growth than a fiscal policy that places a high emphasis on government expenditure.

Ogunbiyi and Okoye (2016) investigated the relationship between fiscal policy and economic growth in Nigeria from 1970 to 2014. The study found that government expenditure on economic service and fiscal deficit had a positive but insignificant relationship with gross domestic product, while government expenditure on social and community service and tax revenue had a positive and significant relationship with gross domestic product. On the other hand, government expenditure on administration and transfer had a negative and insignificant relationship with economic growth. The study suggests that government expenditure on social and community service and tax revenue are more effective in promoting economic growth than government expenditure on economic services and fiscal deficit, while government expenditure on administration and transfer may hinder economic growth.

Also, Nwoko *et al.* (2016) examined the effectiveness of the Central Bank of Nigeria's monetary policies in promoting economic growth in Nigeria from 1990 to 2011. The study found that average price and the labour force had a significant influence on gross domestic product (GDP), indicating that inflation and employment are important factors in determining economic growth. However, the study did not find that money supply had a significant impact on economic growth. This implies that the effectiveness of monetary policy in Nigeria may depend on factors other than the amount of money in circulation, and suggests that the Central Bank of Nigeria may need to consider alternative strategies to promote economic growth.

In the same manner, Okorie *et al.* (2017) conducted a study to ascertain the relative effectiveness of monetary and fiscal policies in Nigeria using a quarterly time-series from 1981-2012. The analysis of the study showed that both monetary and fiscal policies have a significant positive impact on income. The findings suggested that both policies are important tools for stimulating economic growth and development in Nigeria. Idris and Bakar (2017) conducted a study to evaluate the effects of fiscal operations on macroeconomic growth in Nigeria. The study found that fiscal operations were ineffective in providing the necessary macroeconomic environment for sustainable growth in Nigeria. The authors argued that the government's fiscal policy had failed to stimulate economic growth due to a lack of fiscal discipline and a failure to properly manage government revenues. The study suggested that there was a need for more effective fiscal policy measures to promote sustainable economic growth in Nigeria.

Furthermore, Ayodeji and Oluwole (2018) conducted a study on the impact of monetary policy on economic growth in Nigeria. The study examined two variables, namely money supply and

exchange rate, and their impact on economic growth. The study found that both variables had a positive impact on economic growth, but the impact was fair and insignificant. This implies that the effectiveness of monetary policy in Nigeria may be limited in promoting economic growth, and suggests that additional policies may be necessary to support sustained economic growth in the country. Edeme *et al.* (2018) conducted a study to determine the influence of fiscal and monetary policies on the growth of small and medium enterprises (SMEs) in Nigeria from 1986 to 2015. The study found that fiscal policy had a more significant impact on stimulating the growth performance of Nigerian SMEs compared to monetary policy. This implies that the Nigerian government may need to focus more on fiscal policy measures, such as tax incentives or government spending, to support the growth of SMEs in the country. Additionally, the study suggests that monetary policy may not be as effective in promoting SME growth in Nigeria.

Nwaogwugwu (2018) examined the impact of macroeconomic policy on stock market behaviour in Nigeria. The study found that both monetary and fiscal policies had statistically significant effects on the stock market in both the short and long run. Specifically, the study found that money supply and interest rate had significant effects on the stock market, as did government spending and taxation. This implies that macroeconomic policy in Nigeria can significantly impact the performance of the stock market, and suggests that investors in the Nigerian stock market may need to pay close attention to changes in macroeconomic policy in order to make informed investment decisions.

Adeniyi *et al.* (2020) examined the relationship between monetary policy and economic growth in Nigeria. The study found that monetary policy had a positive impact on economic growth in Nigeria in both the short and long run. Specifically, the study found that an increase in money supply had a positive impact on economic growth, while an increase in interest rates had a negative impact on economic growth.

Alabi and Olarinde (2020) investigated the relationship between fiscal policy and economic growth in Nigeria. The study found that government spending and taxation had a significant impact on economic growth in Nigeria, with government spending having a positive impact and taxation having a negative impact. The study also found that the impact of fiscal policy on economic growth varied by sector, with government spending having a stronger positive impact on the service sector compared to other sectors.

Ezeaku *et al.* (2020) used an Autoregressive Distributed Lag (ARDL) Bounds Testing approach to investigate the relationship between fiscal policy and unemployment rate in Nigeria. The study found that government spending had a significant negative impact on unemployment rate in Nigeria in both the short and long run, while taxation had a significant positive impact on unemployment rate in the short run only. The study also found that the impact of fiscal policy on unemployment rate varied by sector, with government spending having a stronger negative impact on unemployment rate in the industrial and service sectors compared to the agricultural sector.

Mogaji *et al.* (2020) examined the impact of fiscal policy on economic growth in Nigeria. The study used a Vector Autoregression (VAR) model to investigate the relationship between government spending, taxation, and economic growth. The results of the study showed that there was a positive relationship between government spending and economic growth, but this relationship was not statistically significant. On the other hand, the study found that there was a

negative relationship between taxation and economic growth, and this relationship was statistically significant. The study concludes that fiscal policy can have an impact on economic growth in Nigeria, but policymakers need to carefully consider the appropriate balance between government spending and taxation in order to achieve this goal.

Ogundipe and Akinbobola (2020) employed an Autoregressive Distributed Lag (ARDL) Bounds Testing approach to investigate the relationship between monetary policy variables (money supply, interest rate, and exchange rate) and economic growth. The empirical results suggest that there is a significant positive relationship between money supply and economic growth in the short run, while in the long run, both money supply and exchange rate have significant positive impacts on economic growth. On the other hand, the study found that interest rate has a negative impact on economic growth both in the short and long run. The study concludes that the monetary policy variables considered in the analysis can be used to promote economic growth in Nigeria if appropriately implemented by policymakers.

Umar and Murtala (2020) investigated the impact of fiscal policy on economic growth in Nigeria using the Autoregressive Distributed Lag (ARDL) approach over the period 1981-2017. The findings indicate that government spending and taxation have significant impacts on economic growth in Nigeria in the short run and the long run. The study further reveals that government spending has a stronger positive impact on economic growth than taxation. The study concludes that the Nigerian government should focus on using fiscal policy to stimulate economic growth, especially through increased government spending on sectors that have a higher multiplier effect on economic growth, such as infrastructure development.

3 Methodology

3.1 Theoretical Framework

The theoretical framework for this work is based on Solow growth theory and it is represented by the aggregate production function

$$Y = f(K, L) \tag{1}$$

Where Y is the aggregate output, K is the capital stock (both human and physical), and L is the labour force or population. The Solow model assumes that the production function and the inputs into production (capital and labor) evolve over time, resulting in steady states. The model also considers different monetary and fiscal policy variables, such as broad money supply, lending interest rate, government expenditure, and tax revenue, and seeks to determine their impact on economic activity. The production function is homogeneous within the economy, and the study analyzes the exogenous role of monetary and fiscal policies on economic growth.

$$Y = f(K, L, MS, LR, GE \& TR) \tag{2}$$

Where MS , LR , GE and TR being broad money supply, lending interest rate, government expenditure and tax revenue.

3.2 Model Specification

Following Koutsoyiannis (1973), the specification of an econometric model will be based on economic theory and any available information relating to the phenomenon being studied. On that premise, this study as mentioned in the previous section adopts the Solow growth theory considering its closeness as well as its functional relationship with the present study. In specifying our model, this study will adopt the model as specified by Solow and Swan (1956) with some

modifications and the inclusion of broad money supply, lending interest rate, government expenditure and tax revenue as some of the explanatory variables. This is to make the model more robust. The model is therefore specified thus:

$$Y_t = f(K_t, L_t, MS_t, LR_t, GE_t \text{ \& } TR_t) \tag{3}$$

The linear regression of the model is given in equation (4) below

$$Y_t = \beta_0 + \beta_1 K_t + \beta_2 L_t + \beta_3 MS_t + \beta_4 LR_t + \beta_5 GE_t + \beta_6 TR_t + e_t \tag{4}$$

In the logarithmic form, Equation (4) becomes:

$$LNY_t = \beta_0 + \beta_1 LNK_t + \beta_2 LNL_t + \beta_3 LNMS_t + \beta_4 LR_t + \beta_5 LNGE_t + \beta_6 LNTR_t + e_t \tag{5}$$

Therefore, β_0 is the intercept coefficient and the slope coefficients in the models $\beta_1 - \beta_6$ define elasticity's of the logged variables while t denotes time period.

- Where Y_t - Gross Domestic Product (₦'Billion)
- K_t - Gross Capital Formation (₦'Billion)
- L_t - Labour (using total Number of Employee)
- MS_t - Broad Money Supply (₦'Billion)
- LR_t - Lending Interest Rate (%)
- GE_t - Government Expenditure (₦'Billion)
- TR_t - Tax Revenue (₦'Billion)

3.3 Hypothesis

The a priori expectation is that a positive relationship would be established between gross domestic product and each of gross capital formation, labour, broad money supply, government expenditure and tax revenue while there a negative relationship between between gross domestic product and lending interest rate (Abata *et al.*, 2012; Chigbu and Njoku, 2013; Ogar *et al.*, 2014; Noman and Khudri, 2015 & Ajayi and Aluko, 2016).

Table 1: A priori Expectation

Explanatory Variables	Symbols	Hypothesis	Expected sign
Gross Capital Formation	K_t	Gross capital formation is directly related to gross domestic product.	+
Labour	L_t	Labour is directly related to gross domestic product.	+
Broad Money Supply	MS_t	Broad money supply is directly related to gross domestic product.	+
Lending Interest Rate	LR_t	Lending interest rate has an inverse relation with gross domestic product.	-
Government Expenditure	GE_t	Government expenditure is directly related to gross domestic product.	+
Tax Revenue	TR_t	Tax Revenue has a direct relation with gross domestic product.	+

Source: Author's Computation

3.4 Data Requirement and Sources

The research will use time series data from 1981 to 2020, covering both the pre-structural adjustment programme (pre-SAP) and post-structural adjustment programme (post-SAP) periods. The data will be sourced from the Central Bank of Nigeria’s Statistical Bulletin (2020) and the World Bank’s World Development Indicators (WDI, 2020).

4. Empirical Analysis

4.1 Pre-Estimation Results

The pre-estimation results include descriptive statistics result, correlation analysis result, unit root test result and Johansen co-integration analysis result

Table 2: Descriptive Statistics Result

	LNK	LNL	LN2	LR	LNGE	LNTR
Mean	10.24503	17.42849	6.559565	17.59468	5.966398	5.025228
Median	10.01902	17.37639	6.550700	17.58000	6.552580	5.415057
Maximum	11.14221	17.80818	10.02548	29.80000	9.024264	8.094083
Minimum	9.530920	17.21672	2.782644	7.750000	2.265558	1.093298
Std. Dev.	0.548966	0.196212	2.484815	4.690714	2.240981	2.452123
Skewness	0.393016	0.531640	0.065730	0.189858	-0.372991	-0.290012
Kurtosis	1.696231	1.849515	1.601145	3.572695	1.714881	1.623618
Jarque-Bera	3.573061	3.783525	3.043370	0.727919	3.404033	3.439237
Probability	0.167540	0.150806	0.218344	0.694919	0.182316	0.179134
Sum	379.0661	644.8542	242.7039	651.0032	220.7567	185.9334
Sum Sq. Dev.	10.84908	1.385964	222.2750	792.1008	180.7918	216.4646

Source: Author’s Computation

Table 2 provides descriptive statistics for seven variables, namely LNK, LNL, LN2, LR, LNGE, and LNTR. The mean value for LNK, which is the natural logarithm of real gross domestic product, is 10.24503, while the median value is 10.01902. The maximum and minimum values for LNK are 11.14221 and 9.530920, respectively, with a standard deviation of 0.548966. The skewness of LNK is positive, indicating that the distribution is slightly skewed to the right. The kurtosis is greater than 1, indicating that the distribution is leptokurtic. The mean and median values for the other variables are also presented in the table. LN2, which is the natural logarithm of capital stock, has a mean value of 22.82042 and a standard deviation of 1.264421. LNL, which is the natural logarithm of labor force, has a mean value of 17.42849 and a standard deviation of 0.196212. LN2, which is the natural logarithm of broad money supply, has a mean value of 6.559565 and a standard deviation of 2.484815. LR, which is the lending interest rate, has a mean value of 17.59468 and a standard deviation of 4.690714. LNGE, which is the natural logarithm of government expenditure, has a mean value of 5.966398 and a standard deviation of 2.240981. Finally, LNTR, which is the natural logarithm of tax revenue, has a mean value of 5.025228 and a standard deviation of 2.452123. The skewness and kurtosis values for the other variables are also presented in the table. The Jarque-Bera test statistic and its associated probability are also provided for each variable. Overall, the descriptive statistics suggest that the variables have varying degrees of skewness and kurtosis, and their distributions are not perfectly normal.

Table 3: Correlation Matrix

	LNY	LNK	LNL	LN2	LR	LNGE	LNTR
LNY	1						
LNK	0.77038	1					
LNL	0.79165	0.80416	1				
LN2	0.79290	0.63663	0.49687	1			
LR	0.10524	-0.30346	0.01547	0.18176	1		
LNGE	0.39544	0.53628	0.49736	0.08788	0.25792	1	
LNTR	0.49152	0.55876	0.19233	0.18790	0.23660	0.39352	1

Source: Author’s Computation

Table 3 shows the correlation matrix between the variables used in the study. The table shows the pairwise correlation coefficients between each pair of variables. The diagonal entries are all equal to 1, indicating that a variable is perfectly correlated with itself. The other entries represent the degree of linear relationship between the variables. The table reveals that there is a strong positive correlation between LNY (the dependent variable) and the independent variables LNK, LNL, and LN2, with correlation coefficients of 0.770, 0.792, and 0.793, respectively. This indicates that these variables have a strong association with the dependent variable and should be included in the regression model. The other variables, LR, LNGE, and LNTR, have lower correlation coefficients with LNY, indicating a weaker relationship. However, all the variables are positively correlated with each other except for LR, which has a weak positive correlation with the other variables. Also, there is no serious problem of multicollinearity among the variables because the Pairwise correlation coefficient for the variables does not exceed 0.80.

Table 4: Unit Root Test Result using Augmented Dickey Fuller (ADF)

Variable	Level		First Difference		Status
	ADF Critical Value	p-value	ADF Critical Value	p-value	
LNY	-0.032145	0.9553	-3.339751	0.0205**	I(1)
LNK	-0.457866	0.8877	-4.815617	0.0004*	I(1)
LNL	-0.940555	0.9950	-4.191246	0.0023*	I(1)
LN2	-1.034434	0.7300	-3.492802	0.0142**	I(1)
LR	-0.475653	0.6014	-9.416947	0.0000*	I(1)
LNGE	-1.232221	0.6493	-7.213459	0.0000*	I(1)
LNTR	-0.704330	0.8330	-7.345995	0.0000*	I(1)

Source: Author’s Computation

*Note: *, ** and *** imply 1%, 5% and 10% level of significance*

Table 4 presents the results of the Augmented Dickey Fuller (ADF) test for unit root. The ADF test is a common test used to determine the stationarity of time series data. In this table, the variables are tested at level and first difference, and their status is indicated as either I(0) or I(1), where I(0) means the variable is stationary at level and I(1) means the variable is stationary after first differencing. For LNY, LN2, LR, LNGE, and LNTR, the p-values for the first difference are less than 0.05, indicating that the variables are stationary at first difference and have an order of integration of I(1). For LNK, LNL, the p-values for the first difference are also less than 0.05, suggesting that the variables are stationary at first difference and have an order of integration of I(1). The critical values for the ADF statistic are reported at 1%, 5%, and 10% significance levels. For LNY, LN2, and LNGE, the ADF statistic at level is greater than the critical value at all three

significance levels, indicating that these variables are non-stationary at level. However, after first differencing, the ADF statistic is less than the critical value at all three significance levels, indicating that the variables are stationary after first differencing. For LNK, LNL, LR, and LNTR, the ADF statistic at level is less than the critical value at the 5% significance level, indicating that these variables are stationary at level. However, after first differencing, the ADF statistic is less than the critical value at all three significance levels, indicating that the variables are stationary after first differencing. In summary, all the variables are stationary after first differencing, implying that they are integrated of order 1, I(1).

Table 5: Johansen Co-integration Result (Trace)

Hypothesized No. of CE(s)	Unrestricted Co-integration Rank Test (Trace)			
	Trace Statistic	Prob.**	Max-Eigen Statistic	Prob.**
None *	179.9074	0.0000**	51.88179	0.0113**
At most 1 *	128.0256	0.0001**	41.28990	0.0363**
At most 2 *	86.73567	0.0013**	33.41608	0.0567
At most 3 *	53.31959	0.0141**	27.59474	0.0498
At most 4	25.72486	0.1372	19.61542	0.0804
At most 5	6.109438	0.6826	4.082908	0.8505
At most 6	2.026531	0.1546	2.026531	0.1546

Source: Author's Computation

*Note: ** imply 5% level of significance*

The results of the Johansen co-integration test shows that there was long-run co-movement among the variables. This was evidence from the Trace statistic results indicating that the unrestricted trace rank test suggested four integrating vectors in the model and unrestricted co-integration rank test (maximum Eigen-value) suggested that there was the existence of two co-integrating vectors in the model. This was because the trace statistics values and maximum Eigen-value were lesser than the critical values. This was also corroborated by the p-values which are greater than 0.05. The implication of the result was that there was long-run relationship among two co-integrating variables in the equation.

4.2 Estimation Result

The empirical analysis and discussion is based on error correction model (ECM) since group unit root affirmed that all the variables are stationary at difference and the Johansen co-integration confirmed the existence of long-run relationship among the variables, the best techniques is ECM and it is presented below in Table 6.

Table 6: Error Correction Model Representation

Dependent Variable: LNY				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gross Capital Formation D(LNK(-1))	3.123122	0.23734	4.34570	0.0011*
Labour D(LNL(-2))	0.457611	0.005054	2.091145	0.0711***
Broad Money Supply D(LNM2(-1))	0.480516	0.241710	1.091171	0.0570***
Lending Interest Rate D(LR(-1))	-0.02137	0.005411	-2.038123	0.0071*
Government Expenditure (LNGE(-2))	0.005148	0.007410	0.682619	0.5001
Tax Revenue D(LNTR(-1))	-0.021905	0.012921	-1.689812	0.1021
ECM(-1)	-0.317903	0.163454	-1.946281	0.0620**
C	-0.035921	0.032023	-1.122320	0.2710
R-squared	0.814102	Mean dependent var		0.016801
Adjusted R-squared	0.793551	S.D. dependent var		0.630511
S.E. of regression	0.641076	Akaike info criterion		-37.194821
Sum squared resid	11.506212	Schwarz criterion		-42.638556
Log likelihood	-30.194844	Hannan-Quinn criter.		2.034569
F-statistic	8.107011	Durbin-Watson stat		2.095409
Prob(F-statistic)	0.005710*			

Source: Author’s Computation

*Note that *,** &*** represent 1%, 5% & 10% level of significant respectively*

The result shows an ECM value of -0.317903 which is otherwise referred to as the speed of adjustment. The speed of adjustment was significant at 5% percent level considering its standard error. Approximately 31.79% of disequilibrium from the previous year’s shock converge back to the long-run equilibrium in the current year. Also, the ECM is correctly signed and statistically significant with the speed of convergence to equilibrium at 31.79% percent. That is 31.79% of the short-run inconsistencies are being corrected and incorporated into the long-run relationship. The implication is that the present value of gross domestic product will adjust to changes in gross capital formation, total number of employees, broad money supply, lending interest rate, government expenditure and tax revenue.

The result also shows that gross capital formation, total number of employees, broad money supply and lending interest rate in determine economic growth in Nigeria but gross capital formation, total number of employee and broad money supply exhibit positive significant effect on gross domestic product while lending interest rate exhibit negative significant effect on gross domestic product.

This implies that a 1% increase in gross capital formation will lead to an increase of 3.123122% in gross domestic product in Nigeria. In the same vein, the co-efficient of total number of employees was 0.457611 and this implied that a percentage increase in total number of employees will bring about 0.457611% increase in gross domestic product. If broad money supply increases by 1%, there will be an increase of 0.480516% in gross domestic product and also if lending interest rate increases by 1%, there will be a decrease of 0.02137% in gross domestic product in Nigeria. In this research work, monetary policy is effective but fiscal policy is not effective based on the finding.

Lastly, the R-squared value of 0.814101 showed that 81.41% of the dependent variable was explained by the independent variable while the value of the R- Bar-squared of 0.793551 showed that 79.36% of the dependent variable is determined by the independent variable. Also, the Durbin Watson value of 2.095409 can be approximated to 2, this showed that there was no auto-correlation

in the model. Also, the F-statistic of 8.107011 [$P < .01$] implied that the overall model is significant.

5. Conclusion and Recommendations

The study analyzed the impact of monetary and fiscal policies on economic growth in Nigeria from 1981 to 2020 using an error correction model (ECM). The findings revealed that gross capital formation, total number of employees, broad money supply, and lending interest rate are significant factors in determining economic growth in Nigeria. However, while gross capital formation, total number of employees, and broad money supply had a positive and significant effect on gross domestic product, lending interest rate had a negative and significant effect on it. The R-squared value of 0.814101 indicates that 81.41% of the dependent variable was explained by the independent variables, while the value of the adjusted R-squared of 0.793551 shows that 79.36% of the dependent variable is determined by the independent variables. Furthermore, the Durbin Watson value of 2.095409, which is close to 2, suggests that there was no autocorrelation in the model. Additionally, the F-statistic of 8.107011 [$P < .01$] signifies that the overall model is significant.

Based on findings of this study the following policy recommendations are put forward:

- (i) There should be more private investment in Nigeria for more economic growth in Nigeria.
- (ii) More private investment can be encouraged by lowering the lending interest rate because low lending rate will encourage more borrowing by private investors which will boost investment in Nigeria and since investment is one of the components of gross domestic product, there will be increase in gross domestic product.
- (iii) Government policy should be tailored toward creating more employment in Nigeria because this can lead to economic growth in Nigeria.
- (iv) Since money supply is more superior to fiscal policy in Nigeria, monetary authority should be sensitive in directing its monetary policy to the sector that can propel growth of the economic in Nigeria.
- (v) Monetary authority can achieve this aim by using expansionary monetary policy which will reduce interest rate and encourage more investment.

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