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Public Spending and Economic Growth In Nigeria: Assessing Recurrent Expenditure's Neutrality and Monetary Policy Interaction

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Abstract: In this study, we explored the influence of public spending on economic growth in Nigeria by testing the neutrality/non-neutrality of recurrent expenditure, as well as checking for the effect of the interaction of the two expenditure components with monetary policy (interest rate) to see how they would influence economic growth. Data which covers the period 1981 to 2021 were analysed using the technique of Autoregressive Distributed Lag (ARDL) model which was selected based on the fact that our variables were stationary at mixed order of levels and first difference. From the ARDL bounds test, the study revealed that there is a long-run relationship among the variables in the model which prompts the estimation of the error correction model. From the results, the findings suggest that recurrent expenditure exerts a positive and significant effect on economic growth, thereby signifying the non-neutrality of the recurrent expenditure component on economic growth. Further, the interactive terms indicate that an interaction of recurrent expenditure and interest rate on economic growth generated a negative effect though its one-period lag yielded a positive and significant effect. Also, the long run results indicate that recurrent expenditure yielded a positive but insignificant effect, thereby indicating the validity of recurrent expenditure in the long-run. This was further confirmed as it exerted a negative but insignificant effect on economic growth when interacting with monetary policy. The policy implication of the findings centres on the fact that recurrent expenditure can only be non-neutral in influencing the macroeconomy just in the short run.

Keywords: Monetary Policy, Fiscal Policy, Lags, Neutrality, Public Spending, Interest Rate.

1. Introduction

The essence of macroeconomic management underlies the importance of government as an important economic agent (Ekpo, 2003) and qualitative government intervention, particularly in policy conceptualisation and formulation is crucial for the robust management of an economy to minimise the pains of depression, recession, poverty and other unwanted economic circumstances in any country. The need for government expenditures to help

ameliorate these economic circumstances embraces the need for appropriate and proper alignment of expenditure priorities to meet essential macroeconomic objectives. Government spending is still a crucial tool used in the process of development. At practically all stages of growth and development, it is crucial to the operation of any economy. The majority of emerging and developed nations currently employ public spending to alter the composition of national income, improve income distribution, and steer resource allocation in desirable directions (Assi et al., 2019; Vtyurina, 2020). For instance, in developing nations, variations in government spending patterns are anticipated to not only provide stability but also promote economic growth and increase job possibilities (World Bank, 2015; Aluthge, Jibir & Abdu, 2021).

Government expenditure is calibrated into both recurrent and capital components. Recurrent expenditure is said to be recurring or what could be claimed to be consumption spending and it lasts only for a limited period of time which at most could be a year. Ahuja, (2011) calls it a non-development expenditure of the government as it seems not to relate to the development activities of the government and is asserted not to raise the productive capacity of the nation as it is seen as an expenditure on goods and services which do not result in the creation or acquisition of fixed assets but majorly a social security expenditure such as wages, salaries, consumables like stationeries, drugs, bandages, purchases, scholarships, unemployment allowance, administration, police and military, law and order, collection of taxation, interest on loans, payment of old age pensions and consumption of fixed capital (depreciation) and so on. So, it could be said to be used in acquiring items that are used up in the process of providing a good or service. Pigou (1928) calls it transferable expenditure as it is not related to the production of goods and services or the generation of income in the economy rather the expenditure causes the transfer of income from the government to individuals and households. Scholarships and unemployment allowances by the government are also two notable examples of this expenditure category.

The expenditure is included as an argument in private agent utility functions hence seen to be a non-productive expenditure whereas capital expenditure is categorised in the literature according to Barro (1990) as productive expenditure. Government capital expenditure is included as arguments in private production functions which imply that they have a direct effect on the rate of economic growth and development hence on the standard of living of the people and in eliminating poverty. The categorisation of recurrent expenditure as non-productive implies that the expenditures have no direct effect on improving the

people's welfare and may even retard it. Endogenous growth theory however, claims it to have a neutral effect on the welfare of private agents and should therefore have neither mitigating nor aggravating effect on the standard of living within society hence there is the need to ruminate about its effect on the economy. Intuitively, excessive spending on consumption at the expense of investment is said to possibly deter growth and vice versa.

The recurrent expenditure category has been rising over the years in Nigeria (see Figure 1) and sometimes over and above its capital expenditure counterpart.

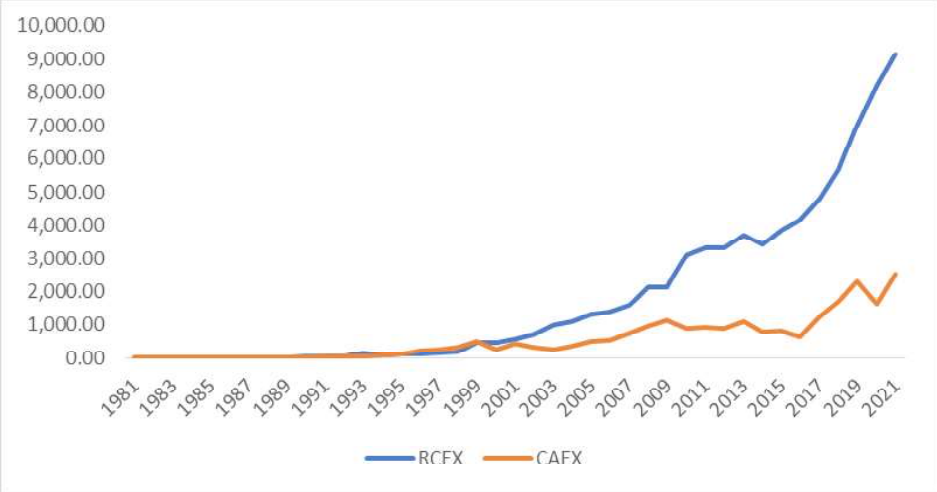

Figure 1: Trend of recurrent expenditure (RCEX) and capital expenditure (CAEX)

The issue is, if the expenditure item of government would not impact welfare and may even retard it according to the literature, why then do governments across the world keep allocating rising votes to it and sometimes the provisions on it rise far and above the capital expenditure portfolio. It could, however, be acclaimed that the rising portfolio of the recurrent expenditure category is a result of the rising size of the government, as there is the need to accommodate increased economic activities. Nevertheless, the increased activities can also be inferred from its counterpart (capital expenditure) hence rising. In line with Figure 1, the proportion of recurrent expenditure has been more than that of capital expenditure right from 1999 (see Figure 2).

The proportion of recurrent expenditure to total expenditure was 42.46% in 1981 and kept on rising to 58.70% in 1984 before it declined to 47.44% in 1986. Meanwhile, it picked up a rising trend reaching 71.06% in 1987 and subsequently declined sharply to 36.56% in 1998. During the period from 1996

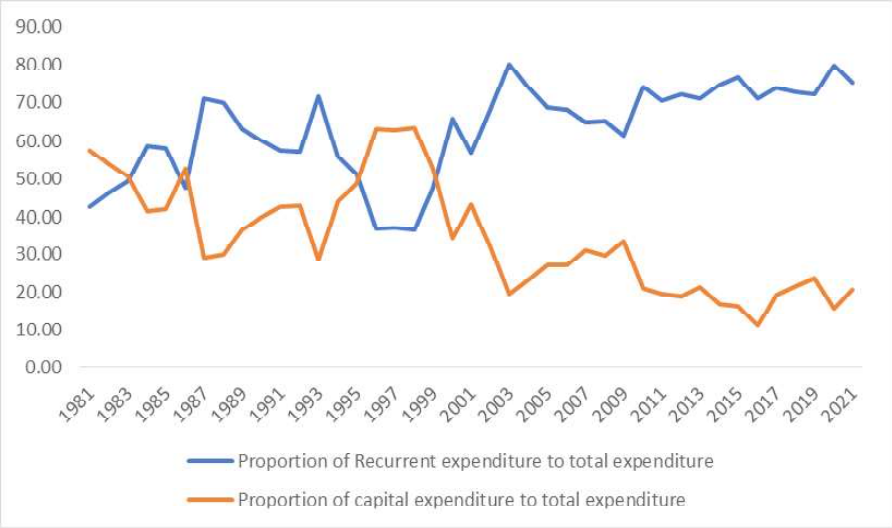

Figure 2: Trend of the proportion of capital and recurrent expenditure in Nigeria

to 1999, the capital expenditure component was taking the lead as it reached 63.44% in 1984 after which it has declined sharply till date. Recent trends indicate that the recurrent expenditure component accounted for 74.13% of total expenditure in 2010; 76.81% of total expenditure in 2015; and 80.03% of total expenditure in 2020 before declining slightly to 75.18% in 2021. It is worth noting that given this massive recurrent expenditure component of the total expenditure of the Federal Government of Nigeria, capital expenditure only accounts for only 11.16% of the total expenditure in 2016 with a mild increase to 20.74% in 2021. This massive increase in the recurrent expenditure component signifies more expenditure on consumption than on investment on the part of the government. Sometimes extra budgetary provisions are made for recurrent expenditure causing huge budget deficits that are inflationary. These deficits run over several years with huge debt servicing costs if financed by borrowing, and this could be problematic for the economy as such, some items of recurrent expenditure would have to be pruned to reduce public debt yet the Federal Government of Nigeria finds it difficult and very rigid to prune expenses in these categories but would rather prefer to reduce the capital expenditure component.

However, the reduction of this assumed unproductive consumption expenditure could cause great consequences to the economy especially when it is associated with realising public investment projects as to undermine the operations and maintenance expenditures needed to run projects at a level

consistent with its expected use and to maintain the capacity of the investment during their expected lifetime and even in administrative activities as it helps in ensuring that the basic administrative needs and standards are in place and therefore the basis for recurrent expenditure requires an understanding of the grave fiscal consequence to cause a serious resolve to be discreet in government expenditure needs. The main objective of this study is to examine the influence of public expenditure on the economic growth of Nigeria from 1981 to 2021. Specifically, the study seeks to: (i) examine the neutrality/non-neutrality of recurrent expenditure on the economic growth of Nigeria, and (ii) ascertain the effect of the interaction of public expenditure with monetary policy on the economic growth of Nigeria.

2. Literature Review

Adam Smith and other classical economists promoted minimal government involvement in the provision of public goods, law and order, and those investments that the private sector was unable to effectively offer owing to their high risk or unprofitable nature (Jibir & Aluthge, 2019). The classical system was shown as being ineffective by the unprecedented Great Depression of the 1930s, which ended the dominance of this philosophy over the global economy. The Keynesian economists, on the other hand, favoured the use of public spending to encourage growth and development by raising aggregate demand, particularly during economic downturns. This is the clear justification for government involvement in economic activity in the contemporary era. This is due to the fact that the government is required to rectify short-term alterations in an economy (Singh & Sahni, 1984; Jibir & Aluthge, 2019; Aluthge, Jibir, & Abdu, 2021) as well as to construct a socially optimum path for a country's growth and development (Ram, 1986). The government also exists to provide basic services such as health, education, communication, and transportation, among others, through expenditures that affect citizens' well-being and the business atmosphere for the private sector (Ukwueze, 2015; Aladejare, 2019; Jibir & Aluthge, 2019).

Consistent with the underlying assumptions of the Neoclassical growth models of Solow (1956), Cass (1965), and their following revisions, discount factors (rates of capital depreciation, population increase, and technological advancement) have a significant role in determining long-run or steady-state economic growth. Although distortionary taxation and productive government spending may influence people's propensities to invest, these changes only have an impact on steady-state factor ratios rather than the rate of economic growth, as the rate of economic growth only changes temporarily before stabilising at

either the old or new steady state (Bleany, Gemmell, & Kneller, 2001). The neoclassical growth models draw the conclusion that government expenditure only has a short-term impact on the economic growth rate. Contrarily, endogenous growth models – especially those of Barro (1990; 1991) and King and Rebelo (1990), suggest that distortionary taxation and productive spending will have a significant impact on the long-run level output path and growth rate as the rate of distortionary taxation changes and as the amount of government productive spending rises. According to endogenous growth models, non-discriminatory taxes and wasteful government spending have no impact on the steady-state growth rate (Sala-i-Martin & Barro, 1995).

In exploring the linkages between public expenditure and economic growth, we employed Keynesian theory. Keynes classified government spending as an exogenous element. According to Keynes, government spending boosts economic growth. As a result, a rise in government consumption is likely to lead to an increase in employment, profitability, and investment via multiplier effects on aggregate demand. As a result, government spending augments aggregate demand, resulting in increased production depending on expenditure multipliers. In analysing the role of government in income stabilisation, Keynes looked at the budget as a tool for government influence on the economy. Taking cognisance of the aggregate demand function which is expressed as:

$$AD = C + I + G \tag{2.1}$$

where AD is aggregate demand, C is private consumption expenditure, I is private investment expenditure, and G is government expenditure.

Following Equation (2.1), C and I are usually expressed as a function of income; and *G* is assumed to be autonomous. This gives the following set of equations:

$$C = a + b(Y\text{-}T) \tag{2.2}$$

where *a* is autonomous consumption, *b* is the marginal propensity to consume, *Y* is the level of income, and *T* is taxes; where $Y - T$ represents personal income. Also,

$$I = I_0 + kY \tag{2.3}$$

where I_0 is the autonomous investment, and kY captures the induced investment.

Given that $G = G_0$, and $AD = Y$, substituting Equation (2.2) and Equation (2.3) into Equation (2.1) yields:

$$Y = a + b(Y–T) + I_0 + kY + G_0 \tag{2.4}$$

$$Y = a + bY–bT + I_0 + kY + G_0 \tag{2.5}$$

By collecting like terms,

$$Y - bY - kY = a + I_0 + G_0 - bT \tag{2.6}$$

$$Y(1 - b - k) = a + I_0 + G_0 - bT \tag{2.7}$$

$$Y = \frac{a + I_0 + G_0 + bT}{1 - b - k} \tag{2.8}$$

Equation (2.8) represents the equilibrium level of income in the economy. Consistent with Equation (2.8), any change in government expenditure will bring about a change in the equilibrium level of income through the multiplier effect which is expressed as:

$$\frac{\Delta Y}{G_0} = \frac{1}{1 - b - k} \tag{2.9}$$

Equation (2.9) is the multiplier, and the change in the level of national income will be given by

$$\Delta Y = \frac{1}{1 - b - k} \Delta G_0 \tag{2.10}$$

Therefore, an increase in government expenditure will lead to an increase in the level of national income through the multiplier effect. Thus, it can be stated that government expenditure increases aggregate demand in the economy. Therefore, *ceteris paribus*, a rise in government expenditure will raise aggregate demand in the economy and hence, the level of income. A reduction in government spending has a corresponding contractionary impact on the level of national income. Taxes, like savings, are known to represent leakages in the income stream, whereas government spending, like investment, is an injection (Iyoha, 2004). In order to boost the amount of income and increase employment during a recession or depression, John Maynard Keynes argued that the government should continually maintain a deficit budget.

Empirical studies on the influence of public expenditure on economic growth have been examined over the years. Ogar, Eyo, and Arikpo (2019) investigated the influence of government spending on Nigerian economic growth. This research looked precisely at the influence of government capital, government recurrent spending, and government fiscal deficit on Nigerian economic growth from 1980 to 2017. The VAR approach, among others, was used to analyse the data. According to the findings, government capital spending had a favourable but negligible influence on Nigerian economic development. Furthermore, the

study found that in the short term, government recurrent expenditure has a negligible positive influence on Nigerian economic growth, but in the long run, it has a positive but insignificant effect on economic growth.

Maximum Likelihood Cointegration was used by Agu and Nyatanga (2020) to examine the connection between Nigeria's fiscal and monetary policies and economic growth. The study discovered evidence for a long-run connection between economic growth, level of openness, government spending, and a broad money supply. Also, Onifade *et al.* (2020) employed Pesaran's ARDL technique to study the effects of government spending on economic growth in Nigeria from 1981 to 2017. According to the study, recurrent spending had a considerable negative influence on Nigerian economic growth, whereas capital expenditure had a positive but minor effect. In summary, government recurrent spending was shown to have a negative influence on economic growth, but public capital expenditures had no beneficial impact on economic growth over the research period.

Aluthge, Jibir, and Abdu (2021) used time series data for the years 1970–2019 to examine the effects of Nigerian government spending (divided into capital and recurrent) on economic growth. In this investigation, the study used the Autoregressive Distributed Lag model. The study takes structural breaks into consideration in the unit root test and co-integration analysis to assure the reliability of the results. The study's main conclusions are that although recurrent spending does not have a major short- or long-term influence on economic growth, capital spending does, both positively and significantly affect economic growth.

The effects of monetary and fiscal policies on Nigeria's economic productivity between 1981 and 2020 were examined by Agu, Okoli, and Olaosebikan (2021). The study analysed the short- and long-term effects of the variables on Nigeria's economic development by using the Autoregressive Distributed Lag (ARDL) estimation technique, the Bound Test approach, and other post-estimation tests. According to the study, when applied separately, both policies have a detrimental influence on economic growth. However, the long-term impact of the combined (interaction model) effect of both policies on economic growth is large and favourable. According to the paper, interactive monetary and fiscal policies should be used by decision-makers to manage the economy.

In order to re-evaluate the claim made by the Keynesian and Endogenous Growth Models that public spending boosts economic growth, Okpabi, Ijuo, and Akiri (2021) looked into the effect of government spending on economic growth in Nigeria over the years 1984 to 2015. Error correction modelling and

Johansen co-integration were used in the study. The empirical findings supported the Keynesian and Endogenous Growth Models' contention that public expenditure stimulates economic growth in Nigeria over the long term by having a significant positive impact on growth of the economy in the long run and a negligible negative impact on the economy in Nigeria in the short run.

Between 1981 and 2020, Ugochukwu & Oruta (2021) investigated the impact of various government expenditure components on economic growth in Nigeria. The Granger Causality Test and Error Correction model were used in the investigation. The short-run model showed that components of government spending, such as recurrent expenditures on health, education, and agriculture, have a negligible adverse effect on economic growth. Recurrent spending on debt servicing, road construction, and other expenses had a favourable but insignificant influence on economic growth. It has been demonstrated that government capital spending on social services has a negative and considerable influence on economic growth. On the other hand, government investments in economic services had a beneficial but minor influence. Over time, every aspect of the employed government spending had a substantial impact on economic expansion.

Using yearly time series data from 1981 to 2018, Magaji (2022) investigated the role of government spending (capital and recurrent) in fostering economic growth in Nigeria over the three-decade period. The variable's stationarity was examined using the unit root test, and the link between the variables was examined using the Autoregressive Distributed Lag (ARDL) model. The results demonstrated that capital spending and economic growth in Nigeria have a negative and statistically significant long-run connection. The outcome also shows that recurrent expenditure and economic growth in Nigeria have a statistically significant and long-term beneficial connection. The study came to the conclusion that economic growth in Nigeria is not correlated with capital expenditure.

Using a bound test under the ARDL technique, Ekpo, Daniel & Okon (2022) used a modified and extended aggregate production model to assess the impacts of government spending at the aggregate level on economic growth in Nigeria over the period 1981-2018. The co-integration analysis demonstrates a long-term link between total government spending and Nigerian economic growth. According to Keynesian theory, the ARDL analysis demonstrates that total government spending had a favourable influence on economic growth in Nigeria. In line with Wagner's Law, the Granger causality test result shows a one-way causal link between total government spending and economic growth.

Several studies focused on the effect of public expenditure on economic growth (see Kolluri et al., 2000; Yasin, 2011; Ono, 2014; Emori, Duke, & Nneji, 2015; Agu, Okwo, Ugwunta & Idike, 2015; Effiong & Inyang, 2020). Meanwhile, the debate on the neutrality/non-neutrality of recurrent expenditure on economic growth has remained an issue of contention in the literature. Further studies who tried to explore the interaction of monetary and fiscal policies in influencing the macroeconomy (see Effiong & Okon, 2020; Ekong & Effiong, 2020; Agu, Okoli & Olaosebikan, 2021; Effiong, Arinze & Okon, 2022) were only interested in aggregate expenditure. To bridge this gap, this study resorts to exploring the neutrality/non-neutrality of recurrent expenditure on economic growth as well as examining the interaction of monetary policy with each of the expenditure components (capital and recurrent expenditures) as it affects economic growth. The study employs the technique of the autoregressive distributed lag (ARDL) model which aids in the examination of both the short-run and long-run estimates based on the information provided by the stationarity test. Our analysis also utilised data from 1981 to 2021 which is long enough to capture different political and economic events that could influence aggregate output in the economy.

3. Methodology

3.1. The Model and Analytical Technique

Endogenous growth theory nonetheless has shown that fiscal policy can affect both the level and growth rate of per capita output (See Barro, 1990; Barro & Sala-i-Martin, 1995). The model for this study is based on the traditional Cob-Douglas production function where Y is defined to be a function of two variables incorporating capital stock (K) and labour (L) with productivity parameters represented by A, thus yielding Equation (1)

$$Y_t = AK_t^{\alpha} L_t^{\beta} \tag{1}$$

By transforming Equation (1) into its linear form, we introduce the natural log of the variables and this gives Equation (2)

$$\ln Y_t = \ln A + \alpha \ln K_t + \beta \ln L_t \tag{2}$$

where *ln* represents the natural log, and *t* is time.

By expanding Equation (2), where Y is represented by RGDP, K is represented by GFCF, and L is represented by LABF and by incorporating the expenditure components and adapting the model of interactive terms by Agu, Okoli & Olaosebikan (2021) we have:

$$RGDP_t = f(GFCF_t, LABF_t, CAEX_t, CXIN_t, RCEX_t, RXIN_t, MGDP_t, PLNR_t, FGDP_t, INFR_t) \quad (3)$$

Where RGDP is the natural log of real gross domestic product (representing economic growth); GFCF is the natural log of gross fixed capital formation (representing capital); LABF is the natural log of the total working population (a proxy for labour); CAEX is the natural log of capital expenditure; CXIN is the interaction term of log of capital expenditure with an interest rate (prime lending rate); RCEX is the log of recurrent expenditure; RXIN is the interaction term of log of recurrent expenditure with an interest rate (prime lending rate); MGSP is the ratio of broad money supply to GDP (measuring financial deepening); PLNR is the prime lending rate (measuring monetary policy); FGDP is foreign direct investment (% of GDP); and INFR is the inflation rate (consumer prices).

By transforming equation (3) into an econometric model and incorporating the error term, we then have:

$$RGDP_t = \varphi_0 + \varphi_1 GFCF_t + \varphi_2 LABF_t + \varphi_3 CAEX_t + \varphi_4 CXIN_t + \varphi_5 RCEX_t + \varphi_6 RXIN_t + \varphi_7 MGDP_t + \varphi_8 PLNR_t + \varphi_9 FGDP_t + \varphi_{10} INFR_t + \mu_t \quad (4)$$

Where φ_0 is the constant of the function (portraying that we are not running a regression through the origin), φ_0 to φ_{10} are the partial slope coefficients of the explanatory variables, and μ_t is the error term which upon assumption, is normally distributed.

Given that our study employs time series data in its analysis, it is pertinent to explore the unit root properties of the variables. This is done by deploying the Augmented Dickey-Fuller (ADF) unit root test developed by Dickey & Fuller (1979). With the constant and deterministic trend assumption deployed, the equation for the test is specified as follows:

$$\Delta Z_t = \delta_0 + \delta_1 Z_{t-1} + \gamma t + \sum_{i=1}^{p} \theta_i \Delta Z_{t-i} + \varepsilon_t \quad (5)$$

Where Z_t is the time series variable of interest in the study, δ_0 is the constant of the evaluation, δ_1 is the coefficient to be tested for unit root, γ measures the coefficient of the trend variable (t), p captures the lag length which is automatically selected using the Schwarz Information Criterion (SIC), θ_i captures the coefficients of the lag value of the changes in the time series variable and as such it aids in ruling out serial correlation in the model, and ε_t is the error term. The unit root test is based on the null hypothesis that δ_1=1. The rejection of the null hypothesis is based on the condition that the ADF must be negative and

statistically significant at the 5% level otherwise, *e* accept the null hypothesis and conclude that the variable contains a unit root.

The key analytical technique of the study follows the autoregressive distributed lag (ARDL) technique which helps in the estimation of both the short-run and long-run models with utmost simplicity. According to Banerjee et al. (1993), Charemza and Deadman (1997), and Johnston and DiNardo (1997), there is a need to capture the short-run and long-run responses before estimating the static long-run equation to avoid generating imprecise coefficient estimates. Enders (1995) acknowledged that using that approach would yield valid t-statistics even when some of the right-hand variables are endogenous. The ARDL model associated with the error correction mechanism is specified below:

$$\Delta RGDP_t = \vartheta + \beta_i X_t + \sum_{i=0}^{p} \gamma_i \Delta RGDP_{t-i} + \sum_{i=0}^{q} \delta_i \Delta X_{t-i} + \theta ECM_{t-1} + \mu_t \qquad (6)$$

Consistent with equation (6), ϑ is the constant term of the function, β_i captures the respective long-run coefficients of the explanatory variable (X_t), γ_i measures the short-run slope coefficient of the lag changes in the dependent variable on itself, *p* and *q* are the lag length of the changes in the dependent and explanatory variables respectively (which are automatically selected based on the Schwarz Information Criterion – SIC), δ_i measures the short-run partial coefficient of the changes in economic growth given the changes in the explanatory variables, θ is the error correction mechanism which is the slope of the one-period lag of the residuals in the model, and μ_t is the disturbance term. The error correction mechanism measures the speed of adjustment of the model from the short-run disequilibrium in order to achieve a long-run equilibrium. The coefficient (θ) must be negative and statistically significant for any adjustment to take place in the model.

3.2. Sources of Data

Data for this study are time series in nature and cover the period from 1981 to 2021. Some of the variables, especially the interaction terms, were constructed. For instance, the interaction term CXIN was constructed by multiplying the log of capital expenditure by interest rate, and the interaction term RXIN was constructed by multiplying the log of recurrent expenditure by interest rate. These two interaction terms measure the joint effect of monetary and fiscal policy within an economy. Data for the study were obtained from the Central Bank of Nigeria (2021) as well as from the World Bank (2020) database concerning World Development Indicators. Data on variables such as labour force, foreign direct

investment, and inflation rate were obtained from the World Bank database while data on all other variables were taken from the Central Bank of Nigeria Statistical Bulletin.

4. Empirical Findings

4.1. Trend Analysis

The analysis of trends of the variables over the years was done based on the two components of government expenditure (capital expenditure and recurrent expenditure) as they relate to economic growth (real gross domestic product). Figure 3 captures the trends in recurrent expenditure (RCEX) and real gross domestic product (RGDP).

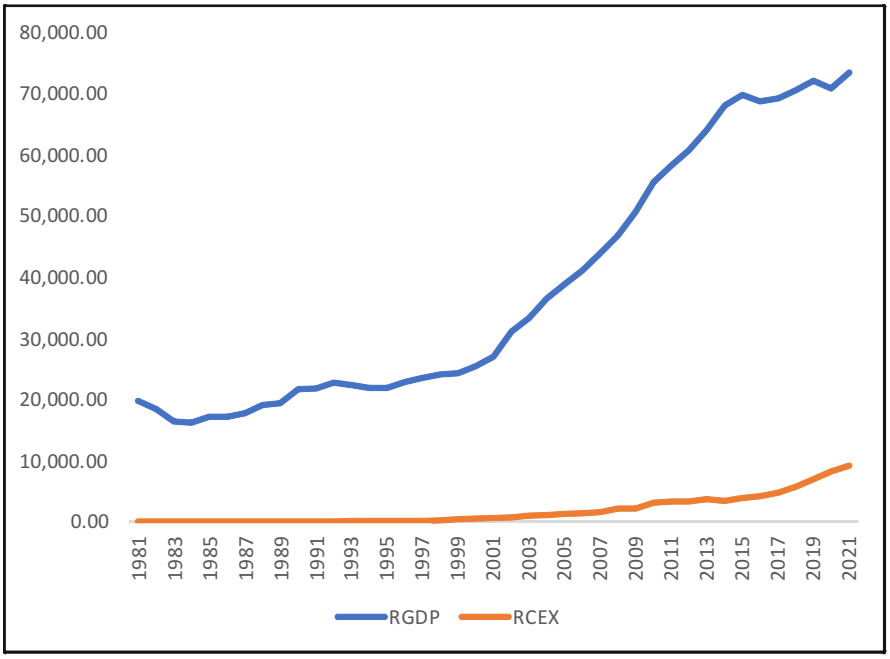

Figure 3: Trends in recurrent expenditure and Real GDP in Nigeria, 1981 – 2021

As observed in Figure 1, the recurrent expenditure of the Federal Government of Nigeria was somewhat sluggish between 1981 and 2002 as it maintained a stable increase. Subsequently, it rose slightly from 2003 reaching ₦9,145.15 billion in 2021 against ₦4.85 billion in 1981. Real gross domestic product had been maintaining an upward trend from 1981 to 2021, though a sharp increase was recorded from ₦26,935.32 billion in 2001 to ₦69,780.69 billion in 2015, and then to ₦73,382.77 billion in 2021. One common trend

between recurrent expenditure and real GDP was that they both maintained an upward trend in recent years.

Going by the trend in capital expenditure and real gross domestic product, Figure 4 captures the trend over the years.

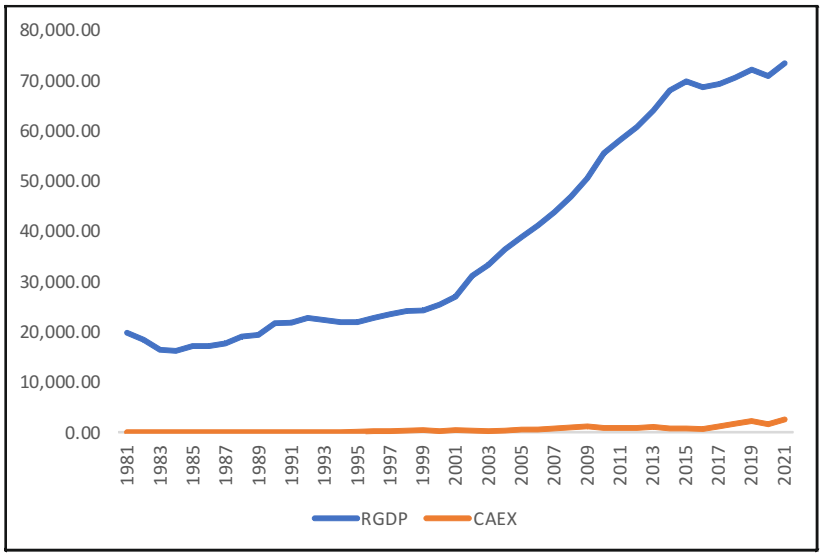

Figure 4: Trends in capital expenditure and GDP in Nigeria

It is evident from Figure 4 that the capital expenditure component has been sluggish compared to the recurrent component. The trend in recurrent expenditure had been on a very slow rise over the years, though real GDP had been maintaining a sharp upward trend.

4.2. Descriptive Statistics

The descriptive properties of the variables are portrayed in Table 1 where both measures of central tendency and measures of dispersion were captured for each of the variables. The discussion in Table 1 is based on the key variables of interest namely, real GDP (RGDP), recurrent expenditure (RCEX), and capital expenditure (CAEX).

It is evident from Table 1 that RGDP averaged 10.41% over the forty-one (41) years under consideration. It has a standard deviation of 0.53%, and it is positively skewed (given the skewness coefficient of 0.27) and platykurtic (given that the coefficient of kurtosis being 1.496 is less than 3.0). Given that the Jarque-Bera statistic of 4.352 and its accompanying p-value of 0.114 portray its insignificance, it can be stated that RGDP was normally distributed during the

Table 1: Descriptive Properties of the Variables

Variables	*Mean*	*Maximum*	*Minimum*	*Standard Deviation*	*Skewness*	*Kurtosis*	*Jarque-Bera*	*Probability*
RGDP	10.41	11.20	9.69	0.53	0.27	1.496	4.352	0.114
GFCF	7.63	10.97	4.47	1.97	-0.23	1.768	2.941	0.230
LABF	18.02	18.55	17.50	0.32	0.002	1.797	2.472	0.291
CAEX	5.12	7.83	1.41	2.05	-0.59	1.899	4.479	0.106
CXIN	90.12	143.56	14.59	38.32	-0.89	2.587	5.711	0.058
RCEX	5.80	9.12	1.56	2.46	-0.39	1.784	3.580	0.167
RXIN	101.99	167.06	12.23	44.40	-0.79	2.502	4.709	0.095
MGDP	15.42	24.90	8.46	5.35	0.55	1.625	5.254	0.072
PLNR	17.31	29.80	7.75	4.64	0.27	3.518	0.953	0.621
FGDP	0.33	1.92	-0.08	0.45	2.24	7.784	73.222	0.000
INFR	18.95	72.84	5.39	16.66	1.85	5.307	32.582	0.000

Source: Researchers' Computation (2023).

study period. Capital expenditure averaged 5.12% with a standard deviation of 2.05% and it is negatively skewed with a coefficient of -0.59, platykurtic with a 1.899 coefficient of kurtosis (being less than +3), and it is normally distributed given that the Jarque-Bera statistic of 4.479 is insignificant at the 5% level. Similarly, recurrent expenditure averages 5.80% with a standard deviation of 2.46% and it is negatively skewed given the -0.39 coefficient of skewness. The distribution is platykurtic since the coefficient of kurtosis being 1.784 is less than 3, and it is normally distributed since the Jarque-Bera statistic of 3.580 is insignificant at the 5% level.

4.3. Correlation Analysis

The correlation analysis was conducted to ascertain the direction of association between variables utilised in the study. For emphasis, the correlation analysis will be discussed based on the key variables of interest along with the interaction terms. Table 2 captures the computed Pearson correlation coefficients for the variables.

It can be observed from Table 2 that all the expenditure components and their respective interaction terms are positively correlated with RGDP, and such correlations are very strong. For instance, the correlation between CAEX and RGDP is +0.88 and the correlation between RCEX and RGDP is +0.94. Similarly, the correlation between CXIN and RGDP is +0.69 while that of RXIN and RGDP is +0.77. These strong correlations do not in any way portray a cause-effect relationship. Hence, further analysis will be conducted to ascertain whether such strong correlations imply any significant effect on economic growth.

Table 2: Correlation Matrix of the Variables

	RGDP	*GFCF*	*LABF*	*CAEX*	*CXIN*	*RCEX*	*RXIN*	*MGDP*	*PLNR*	*FGDP*	*INFR*
RGDP	**1.00**										
GFCF	0.95	**1.00**									
LABF	0.97	0.99	**1.00**								
CAEX	0.88	0.98	0.95	**1.00**							
CXIN	0.69	0.82	0.78	0.88	**1.00**						
RCEX	0.94	0.99	0.98	0.98	0.85	**1.00**					
RXIN	0.77	0.85	0.83	0.88	0.98	0.89	**1.00**				
MGDP	0.91	0.78	0.85	0.70	0.49	0.79	0.59	**1.00**			
PLNR	-0.02	0.07	0.06	0.16	0.56	0.15	0.54	-0.13	**1.00**		
FGDP	-0.23	-0.19	-0.20	-0.12	0.10	-0.14	0.06	-0.23	0.54	**1.00**	
INFR	-0.35	-0.31	-0.31	-0.29	-0.13	-0.29	-0.14	-0.29	0.34	0.55	**1.00**

Source: Researchers' Computation (2023)

4.4. Unit Root Test

The conduct of the unit root test was geared towards ascertaining the order of integration of the time series variables in the study. The Augmented Dickey-Fuller (ADF) test was employed in this regard with the constant and trend assumption being utilised. Table 3 presents the test result, where I(0) indicates that the variable is stationary at the level and I(1) portrays that the variable is stationary at the first difference.

Table 3: Augmented Dickey-Fuller (ADF) Unit Root Test Result

Variable	*ADF Statistic at Level*	*ADF Statistic at First Difference*	*Probability*	*Order of Integration*
RGDP	-1.4472	-3.8912	0.0219	I(1)
GFCF	-2.2289	-3.9286	0.0201	I(1)
LABF	0.1537	-3.6201	0.0315	I(1)
CAEX	-1.4554	-6.7674	0.0000	I(1)
CXIN	-2.3215	-7.6892	0.0000	I(1)
RCEX	-0.672	-8.7697	0.0000	I(1)
RXIN	-2.084	-6.5621	0.0000	I(1)
MGDP	-2.1979	-5.7079	0.0000	I(1)
PLNR	-3.2596	-6.3678	0.0000	I(1)
FGDP	-4.4301	————	0.0069	I(0)
INFR	-4.1023	————-	0.0131	I(0)

Source: Researchers' Computation (2023).

The results in Table 3 portray that the variables utilised in the study were in mixed order of integration. That is, some of the variables were stationary at level while others were stationary at first difference. Given the result, foreign direct investment (FGDP) and inflation rate (INFR), were both stationary at level while

all other variables were stationary only after first differencing. The stationarity of the time series variables in mixed order of I(0) and I(1) calls for the detection of the existence of long-run (level) relationships among the variables in the model.

4.5. Test for Cointegration

For the reason that the time series variables are stationary in mixed order of levels and first difference, the cointegration test was conducted to detect whether any long-run relationship existed in the model. In order to achieve this, the ARDL Bounds test for levels relationship was conducted and Table 4 presents the results. The test was conducted using the 5% level of significance in comparing the upper and lower bounds. The null hypothesis was that there is no level relationship in the model.

Table 4: ARDL Bounds Test Result

Test Statistic	*Value*	*Significance*	*I(0)*	*I(1)*
F-statistic	5.8803	10%	1.76	2.77
k	10	5%	1.98	3.04
		2.5%	2.18	3.28
		1%	2.41	3.61

Source: Researchers' Computation (2023).

The Bounds test for levels relationship was conducted using the F-statistic which is often compared with the lower bound, I(0), and upper bound, I(1) values. With k=10, it indicates that the model estimates ten (10) parameters. From the results in Table 4, the F-statistic is 5.8803, the lower bound is 1.98, and the upper bound is 3.04. Since the F-statistic lies outside the lower and upper bounds, the null hypothesis of no level relationship is rejected. Consequently, there is cointegration in the model and we will have to estimate both the short-run and the long-run models.

4.6. Short-Run Autoregressive Distributed Lag (ARDL) Model Estimation

The existence of cointegration in the model requires the estimation of both the short-run and the long-run models under the ARDL framework. The short-run error correction model was estimated, and Table 5 presents the result of the study. The results indicate that the previous year's growth significantly influences the current year's growth. Thus, the one-period lag of RGDP increased the current value by 0.2885%. Hence, RGDP is strongly endogenous in nature. It can also be noted that at the 5% level, GFCF and its one-period lag generated a negative and significant influence on economic growth during the study period. A one unit

increase in changes in GFCF could lead to a 0.0533% decrease in economic growth, while its one-period lag reduces economic growth by 0.0704% on an average. The reason for such negative effect could be associated with capital consumption which is not being accounted for as could be seen from infrastructural decays.

Changes in the labour force were observed to exert a negative but insignificant influence on economic growth while its one-period lag exerted a negative and significant effect. Therefore, the previous year's labour force reduced the current year's growth by 18.3778% on average. This could be linked to low labour absorption capacity as could be seen in the rising unemployment rate in the country in recent times. The result further indicates that while financial deepening exerts a negative and significant influence on economic growth, interest rates yield a positive and significant effect. This is against a priori expectation, and could be linked to a lack of prudential regulation with attendant financial repression in the country.

Table 5: ARDL Short-Run Error Correction Model Result

Dependent Variable: Δ(RGDP)
Selected Model: ARDL(2, 2, 2, 2, 2, 2, 2, 1, 1, 0, 0)

Variable	*Coefficient*	*Standard Error*	*t-Statistic*	*Probability*
Ä(RGDP(-1))	0.2885	0.0698	4.1322	0.0014*
Ä(GFCF)	-0.0533	0.0272	-1.9614	0.0734
Ä(GFCF(-1))	-0.0704	0.0269	-2.6190	0.0224*
Ä(LABF)	-3.1880	2.3601	-1.3508	0.2017
Ä(LABF(-1))	-18.3778	2.7385	-6.7109	0.0000*
Ä(CAEX)	-0.1492	0.0365	-4.0843	0.0015*
Ä(CAEX(-1))	0.1536	0.0321	4.7842	0.0004*
Ä(CXIN)	0.0113	0.0022	5.2365	0.0002*
Ä(CXIN(-1))	-0.0071	0.0017	-4.1169	0.0014*
Ä(RCEX)	0.1654	0.0349	4.7361	0.0005*
Ä(RCEX(-1))	-0.1353	0.0300	-4.5085	0.0007*
Ä(RXIN)	-0.0127	0.0022	-5.8176	0.0001*
Ä(RXIN(-1))	0.0075	0.0016	4.7825	0.0004*
Ä(MGDP)	-0.0093	0.0019	-4.7571	0.0005*
Ä(PLNR)	0.0124	0.0025	5.0273	0.0003*
	-0.2975	0.0256	-11.6296	0.0000*
R-squared	0.9146	Mean dependent var		0.0355
Adjusted R-squared	0.8589	S.D. dependent var		0.0446
S.E. of regression	0.0168	Akaike info criterion		-5.0463
Sum squared residual	0.0065	Schwarz criterion		-4.3638
Log likelihood	114.4026	Hannan-Quinn criterion		-4.8014
Durbin-Watson stat	2.2576			

Note: * indicates significance at the 5% level.
Source: Researchers' Computation (2023)

The short-run ARDL model result presents an error correction term of -0.2975 which is also statistically significant at the 5% level. It follows that only 29.75% of the total short-run distortions in the model are corrected annually for equilibrium to be restored. That is, it will take about three years and six months for equilibrium in the model to be fully restored. The r-squared of 0.9146 indicates that the explanatory variables in the model jointly explain 91.46% of the total variation in economic growth during the study period; and by accounting for degree of freedom, the explanatory variables still explain 85.89% of the total variation in economic growth as revealed by the adjusted r-squared. The model is free from autocorrelation given that the Durbin-Watson statistic of 2.2576 is within the appropriate range.

The results in Table 5 reflect that while changes in capital expenditure exert a negative and significant effect on economic growth, its one-period lag exerts a positive and significant influence on growth. This is an indication that capital spending will take time before it can translate into a meaningful growth driver through its impacts on capital formation and infrastructural development within the economy. From the coefficient, previous years' capital expenditure increased economic growth by 0.1536% on average. However, its current value leads to a 0.1492% decrease in economic growth on average. Given that these coefficients are less than unity, it is an indication that economic growth responds slowly to changes in capital expenditure within the economy. By interacting fiscal policy, that is, capital expenditure and monetary policy, that is, interest rate (CXIN) to see how successful monetary-fiscal coordination could spur growth, findings from the study indicate that changes in such interaction will lead to a positive and significant effect on economic growth; while its one period lag will have a negative and significant effect. From the coefficient, a unit increase in changes in CXIN will lead to a 0.0113% increase in economic growth; while its one-period lag will lead to a 0.0071% decrease in economic growth.

For changes in recurrent expenditure, it is observed that it exerts a positive and significant influence on economic growth while its one-period lag exerts a negative and significant influence. This negative effect aligns with the findings of Bencivenga (2018) who reported a negative effect of recurrent expenditure on economic growth. The significant effect of the recurrent expenditure component on influencing economic growth portrays the fact that recurrent expenditure is not neutral in influencing economic growth in Nigeria. It is clear from its coefficient that a unit per cent increase in recurrent expenditure leads to a 0.1654% increase in economic growth; while the previous year's recurrent expenditure reduces economic growth by 0.1353% on average. By looking at the

changes in the interactive term (RXIN), recurrent expenditure interacting with interest rate exerts a negative and significant effect on economic growth; while its one-period lag yields a positive and significant effect. Thus, a unit per cent increase in changes in RXIN will lead to a 0.0127% decrease in economic growth, while the previous year's interaction will lead to a 0.0075% increase in economic growth. This finding is a clear indication of the importance of lags in both monetary and fiscal policy actions in the economy.

The implication of the above findings is that while recurrent expenditure is not neutral in influencing economic growth in Nigeria during the study period, it is only an effective interaction (coordination) of monetary policy with capital expenditure that could bring the desired positive effect on economic growth. This arises from the negative effect of the interaction of recurrent expenditure and interest rate on economic growth. However, it is also worth noting that though the interaction of capital expenditure with interest rate will yield positive effect, the negative one-period lag effect on growth points to the fact that the previous year's interest rate effect could be detrimental to growth. Further, though the interaction of interest rate with recurrent expenditure yields a negative effect, the positive effect of its one-period lag on growth signifies the fact that it takes time before policies of increasing recurrent expenditure could have the desired effect on the overall economy.

4.7. Long Run ARDL Estimates

In the long run, the estimates of the model are presented in Table 6 where it is observed that GFCF still exerts a negative but insignificant influence on economic growth in the long run, while LABF generates a positive but insignificant effect.

Table 6: The ARDL Long Run Results

Variable	*Coefficient*	*Standard Error*	*t-Statistic*	*Probability*
GFCF	-0.1153	0.2689	-0.4287	0.6757
LABF	1.2686	1.3689	0.9267	0.3723
CAEX	-0.9642	0.8990	-1.0726	0.3046
CXIN	0.0534	0.0481	1.1116	0.2881
RCEX	1.2098	0.7979	1.5163	0.1553
RXIN	-0.0605	0.0446	-1.3543	0.2006
MGDP	0.0106	0.0136	0.7838	0.4484
PLNR	0.0675	0.0248	2.7175	0.0187*
FGDP	-0.0606	0.0796	-0.7611	0.4613
INFR	-0.0021	0.0019	-1.1036	0.2914
C	-11.5236	22.7754	-0.5060	0.6220

Note: * indicates significance at the 5% level.
Source: Researchers' Computation (2023)

Without interaction with interest rate, capital expenditure exerts a negative but insignificant effect on economic growth (which is in line with the findings of Magaji, 2022), while its effect becomes positive but insignificant upon interaction. On the contrary, the effect of recurrent expenditure on economic growth without interaction with interest rate is positive but insignificant but becomes negative and insignificant upon interaction. Financial deepening is observed to yield a positive but insignificant influence on economic growth in the long run, while the effect of interest rates is positive and significant. A 1% increase in interest rate leads to a 0.0675% increase in economic growth on average. The positive and significant effect of interest rates on economic growth is against a priori expectation but could be as a result of the need to maintain a positive real interest rate which is a pre-requisite for growth. However, the effect of foreign direct investment and the inflation rate is both negative but insignificant in influencing economic growth in the long run.

4.8. Stability Test

In order to ascertain the stability of the parameters of the model, the stability test was conducted based on the Cumulative Sum (CUSUM) approach as shown in Figure 4.

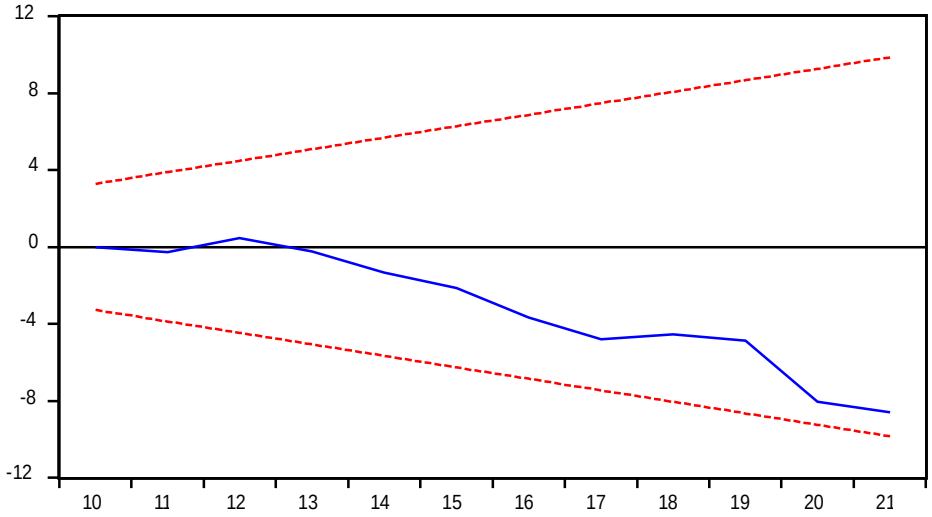

Figure 4: Cumulative Sum Test for Stability

For the reason that the 5% line lies within the upper and lower bounds, we have clear evidence that the parameter estimates of the model are stable for inference.

5. Conclusion

This study has been concerned with exploring the recurrent expenditure neutrality postulation, as well as venturing into examining the interaction effect of monetary and fiscal policy in influencing economic growth in Nigeria. Time series data for the period 1981 to 2021 was utilised, and the analysis followed the autoregressive distributed lag approach. Findings from the study indicate that there is a long run relationship between economic growth and the explanatory variables in the model. In the short run, it was discovered that recurrent expenditure neutrality postulation does not hold, as it exerts a positive and significant effect on economic growth. However, the one-period lag of recurrent expenditure generated a negative and significant effect on economic growth in the short run. By interacting recurrent expenditure with monetary policy (measured by interest rate), our result indicates that recurrent expenditure has a negative and significant influence on economic growth in the short run, while its one-period lag exerted a positive and significant effect on the economic growth of Nigeria during the study period. In the long run, recurrent expenditure exerted a positive but insignificant effect on economic growth in Nigeria indicating the validity of recurrent expenditure in the long run. By interacting recurrent expenditure with monetary policy, the effect now becomes negative but still insignificant. Based on the findings, it can be concluded that recurrent expenditure neutrality in Nigeria is only valid in the long run and not in the short run. The implication of this is that recurrent expenditure can only be utilised on a short run basis to improve the macroeconomy.

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