IJAAR PUBLISHING®

African Journal of Business and Economic Development | ISSN: 2782-7658
Vol. 6, Issue 4 (2026) | https://doi.org/10.46654/hgpb6r28

IMPACT OF GOVERNMENT EXPENDITURE ON ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

This study examined the impact of government expenditure on economic growth in Nigeria, with particular emphasis on its long-run and short-run effects and the causal relationship between government expenditure and economic growth. The study was motivated by the persistent increase in public expenditure in Nigeria alongside relatively weak and unstable economic growth, as well as the inconclusive findings reported in the existing literature. Annual time-series data covering 1981–2024 were employed, with real gross domestic product (RGDP) serving as the measure of economic growth, while government expenditure (GEXP), gross fixed capital formation (GFCF) and inflation (INF) were incorporated into the model. The findings indicate that increases and decreases in government expenditure do not exert identical effects on economic growth, thereby providing evidence of asymmetry in the expenditure-growth relationship. The diagnostic tests further indicated that the estimated model was free from serial correlation, heteroskedasticity and functional-form misspecification at the 5 percent significance level. The Granger causality results revealed a significant causal relationship between government expenditure and economic growth at the conventional 5 percent threshold, while the direction of causality was not uniform across the variables. Based on these findings, the study recommends that Nigerian fiscal authorities should prioritise productive and growth-enhancing expenditure, strengthen expenditure monitoring and ensure that fiscal expansion is channelled towards investments capable of improving productive capacity and sustaining long-run economic growth.

Keywords: *government expenditure, economic growth,*

INTRODUCTION

Economic growth remains a central concern of macroeconomic policy because sustained expansion in real output provides the foundation for employment creation, income generation, poverty reduction and improvements in living standards. In developing economies, however, growth is rarely determined by private-sector activity alone. The provision of public infrastructure, education, health services, security, institutions and other public goods creates conditions within which private investment and production can expand. Government expenditure therefore occupies an important position in the development process because it represents one of the principal channels through which the state influences aggregate demand, productive capacity and the distribution of economic opportunities (Keynes, 1936; Barro, 1990; Romer, 2001). In this regard, the effectiveness of government expenditure has become as important as its magnitude, particularly in economies where fiscal resources are limited and competing development needs are substantial.

Another important explanation of the government expenditure-growth relationship is Wagner's law of expanding state activity. Wagner (1883) argues that economic development itself generates greater demand for public services, thereby causing government expenditure to increase as national income rises. This proposition reverses the simple Keynesian direction of causality and suggests that observed association between government expenditure and economic growth may partly reflect the fact that richer economies demand and can finance larger public sectors. Empirical evidence has consequently produced competing conclusions about whether expenditure causes growth, growth causes expenditure, or whether feedback exists between the two variables (Wagner, 1883; Peacock and Wiseman, 1961; Henrekson, 1993; Afonso and Furceri, 2010). The possibility of reverse or bidirectional causality makes it necessary to complement expenditure-growth estimation with an explicit causality test.

Nigeria's recent macroeconomic experience makes this question even more compelling. The World Bank reports that real GDP growth reached 3.4 percent in 2024, with fourth-quarter growth rising to 4.6 percent, while the consolidated fiscal deficit declined from 5.4 percent of GDP in 2023 to about 3.0 percent in 2024 because of stronger revenue mobilisation (World Bank, 2025). The improvement in fiscal balances, however, did not immediately translate into broad improvements in household welfare. Inflation remained elevated, while poverty and weak purchasing power continued to constrain living standards. More recent World Bank evidence indicates that macroeconomic stabilization has continued, but household incomes have not fully recovered and poverty remains high, reinforcing the need for better-quality public spending and targeted investment in human and physical capital (World Bank, 2025, 2026).

The contemporary fiscal environment therefore presents a difficult policy trade-off. On one hand, Nigeria requires higher and more effective public investment to overcome infrastructure deficits, strengthen human capital and create an enabling environment for private-sector-led growth. On the other hand, indiscriminate expenditure expansion can intensify fiscal pressures, inflation and debt-service obligations, particularly where revenue mobilisation remains inadequate (IMF, 2024; World Bank, 2025). The International Monetary Fund has repeatedly emphasized the importance of improving fiscal efficiency, strengthening revenue mobilisation and protecting high-priority social and capital expenditure. The implication is that the developmental impact of government expenditure depends critically on its composition, financing and efficiency rather than merely on the aggregate amount spent (IMF, 2024).

An additional source of disagreement is methodological. Conventional linear models impose the assumption that an increase in government expenditure and a reduction of the same magnitude have equal but opposite effects on economic growth. Such an assumption may be inappropriate where fiscal adjustments are asymmetric. For example, an increase in public expenditure on infrastructure may take several years before generating productive benefits, whereas a sudden reduction in expenditure can immediately disrupt ongoing projects and reduce aggregate demand. Similarly, expenditure increases may be associated with inflationary pressure when supply capacity is constrained, while expenditure reductions may improve macroeconomic stability over time. These possibilities imply that positive and negative fiscal shocks can operate through different channels and need not produce mirror-image effects (Shin et al., 2014; Usman et al., 2024; Babatunde et al., 2024).

Recent Nigerian research provides support for this nonlinear perspective. Usman et al. (2024), using a nonlinear autoregressive distributed lag approach, found asymmetric effects of fiscal deficit financing on Nigerian macroeconomic outcomes. Their evidence suggests that positive and negative fiscal shocks can generate different consequences, thereby questioning the adequacy of models based exclusively on symmetry. Similarly, Babatunde et al. (2024) examined nonlinear causal links among functional recurrent components of government spending and economic growth in Nigeria, highlighting the importance of moving beyond a simple aggregate and symmetric treatment of fiscal variables. Although fiscal deficit and recurrent expenditure are not identical to aggregate government expenditure, these studies are relevant because they demonstrate that Nigeria's fiscal-growth relationships may depend on the direction and nature of fiscal changes.

The issue of causality further complicates the relationship. If expenditure stimulates output, then fiscal expansion can be justified as a growth-supporting policy. If economic growth instead causes higher government expenditure, the appropriate interpretation changes: government spending may be responding to increased fiscal capacity and public demand generated by a growing economy. If both directions exist, then fiscal policy and economic growth may reinforce one another through a feedback mechanism. Recent Nigerian evidence has reported support for different versions of these propositions, indicating that the direction of causality remains an empirical question (Aliyu and Salisu, 2022; Babatunde et al., 2024). This provides a strong justification for incorporating Granger causality analysis into the present study rather than inferring causality from the sign and significance of a single regression coefficient.

The role of investment provides another reason for carefully specifying the expenditure-growth model. Gross fixed capital formation represents the accumulation of productive assets such as machinery, equipment, buildings and infrastructure and is widely recognized as an important determinant of productive capacity. Government expenditure can influence capital formation directly through public investment and indirectly through infrastructure that complements private capital (Aschauer, 1989; Barro, 1990). However, inefficient government spending or excessive borrowing may reduce private investment through crowding-out effects (Barro, 1990; Tanzi and Schuknecht, 2000). Including GFCF therefore allows the empirical model to distinguish the government expenditure effect from the broader investment channel through which productive capacity influences output.

Inflation is also incorporated because the nominal expansion of government expenditure does not necessarily represent an equivalent increase in real economic activity. Where productive capacity is constrained, fiscal expansion may increase aggregate demand faster than supply, resulting in price pressures. Persistent inflation can then weaken real household income, raise production costs and reduce the real value of investment. Nigeria's recent experience

illustrates this concern. The World Bank has continued to identify elevated inflation, especially food inflation, as a major obstacle to translating macroeconomic stabilization into improvements in household welfare (World Bank, 2025, 2026). Consequently, controlling for inflation is important when estimating the relationship between government expenditure and real GDP.

The present study consequently investigates the impact of government expenditure on economic growth in Nigeria using annual data for 1981–2024. Economic growth is measured by real gross domestic product (RGDP), while government expenditure (GEXP) is the principal explanatory variable. Gross fixed capital formation (GFCF) and inflation (INF) are included as conditioning variables. More importantly, the study decomposes government expenditure into positive and negative partial sums within the nonlinear autoregressive distributed lag framework. This permits the estimation of separate long-run and short-run responses of economic growth to expenditure increases and expenditure decreases.

The NARDL framework developed by Shin et al. (2014) is particularly suitable because it permits asymmetric effects to be examined within a dynamic distributed-lag structure. It also accommodates variables that are integrated at level or first difference, provided none is integrated of order two, and enables the researcher to distinguish long-run equilibrium effects from short-run adjustments. In the context of government expenditure, this distinction is important because the economic effects of public spending may be delayed. Infrastructure projects may require several years before generating measurable output benefits, while expenditure cuts may produce relatively immediate effects through reduced demand, project interruption or lower public-sector activity.

The study is therefore designed around three complementary questions: whether government expenditure has a significant long-run effect on economic growth, whether it has a significant short-run effect, and whether a causal relationship exists between government expenditure and economic growth. The first two questions are addressed through the nonlinear dynamic estimation, while the third is examined through Granger causality. By combining these approaches, the study seeks to distinguish association, dynamic adjustment and temporal predictive direction rather than treating them as identical concepts.

The significance of this approach is reinforced by the current Nigerian policy environment. Recent evidence shows that macroeconomic stabilization has improved, fiscal balances have strengthened and growth has become more resilient, yet poverty, inflation and weaknesses in public-service delivery remain substantial challenges (World Bank, 2025, 2026). The policy challenge is therefore increasingly one of achieving better outcomes from available public resources. Evidence on whether expenditure expansion, expenditure contraction or both have meaningful effects on real output can help policy makers determine whether fiscal policy should emphasize larger spending envelopes, better expenditure composition, improved implementation efficiency or stronger fiscal discipline.

LITERATURE REVIEW

2.1 Government Expenditure

Government expenditure refers to the financial resources committed by the public sector to the provision of goods and services, transfers, public investment, administration and other activities undertaken in pursuit of collective economic and social objectives. In macroeconomic analysis, public expenditure is an important component of aggregate demand because government purchases enter directly into national income, while transfers and public services affect household disposable income, consumption and private-sector incentives. The

role of expenditure, however, extends beyond its demand effect. When government resources are directed to infrastructure, education, health, security and other productivity-enhancing services, expenditure can increase the economy's productive capacity and influence the long-run path of output (Keynes, 1936; Barro, 1990; Romer, 2001).

2.1.2 Economic Growth

Economic growth refers to a sustained increase in the real volume of goods and services produced by an economy over time. It is generally measured using real gross domestic product or real GDP per capita because nominal GDP may increase simply because of changes in the general price level. Real GDP is therefore more appropriate for examining whether an economy's productive capacity has expanded. Growth reflects improvements in the quantity and quality of productive resources, technological progress, capital accumulation, labour productivity, human capital and the institutional environment (Solow, 1956; Romer, 1986; Lucas, 1988).

In developing economies, economic growth is particularly important because sustained increases in productive output can expand employment opportunities, strengthen government revenue and create resources for investment in social and physical infrastructure. However, growth can be uneven and may not automatically translate into improvements in welfare. The quality and inclusiveness of growth depend on employment generation, inflation, income distribution, human capital and access to productive opportunities. This distinction is relevant to Nigeria, where episodes of output expansion have often occurred alongside persistent poverty, unemployment and infrastructure constraints (World Bank, 2025, 2026).

The connection between government expenditure and economic growth can therefore operate through several channels. Public expenditure may raise aggregate demand in the short run; it may increase the stock of public capital and productivity in the long run; it may crowd in private investment by reducing infrastructure constraints; or it may crowd out private investment when financed through distortionary taxation or borrowing. The net outcome depends on the composition, timing, financing and efficiency of expenditure (Barro, 1990; Bose et al., 2007; IMF, 2024).

2.2 Theoretical Review

2.2.1 Keynesian Theory of Government Expenditure

The Keynesian theory of government expenditure provides the principal theoretical foundation for this study. Keynes (1936) argues that output and employment in the short run are determined by aggregate demand, particularly where the economy operates below full employment. Government expenditure constitutes an autonomous component of aggregate demand and can therefore influence national income directly. In a simplified closed economy, equilibrium income can be expressed as $Y = C + I + G$, where Y represents national income, C consumption, I investment and G government expenditure. An increase in G raises aggregate demand and, through the multiplier mechanism, increases equilibrium income.

The theory is particularly relevant to the present study because the estimated model distinguishes between increases and decreases in government expenditure. A positive expenditure shock can stimulate aggregate demand, whereas a negative shock can reduce demand, particularly when private consumption and investment are weak. There is no theoretical requirement that these two shocks must have equal and opposite effects. For example, an expenditure increase directed toward productive infrastructure may have a delayed but persistent supply-side effect, while a sudden expenditure reduction may interrupt

existing projects and immediately lower aggregate demand. This provides an important conceptual justification for examining asymmetry.

2.2.2 Wagner's Law of Increasing State Activity

Wagner's law provides an alternative theoretical explanation of the relationship between government expenditure and economic growth. Wagner (1883) proposes that as an economy develops, public expenditure tends to rise because industrialisation, urbanisation, social complexity and demand for public services increase. Under this interpretation, economic growth is the cause and government expenditure is the consequence. The theory therefore reverses the direction implied by the simple Keynesian expenditure-led growth mechanism.

Wagner's proposition is important for this study because the existence of a positive association between government expenditure and GDP does not by itself establish that expenditure causes growth. If economic expansion increases tax revenues and public demand, government may simply have more resources and greater pressure to spend. This possibility makes a causality test particularly relevant. The present study therefore treats Granger causality as complementary to the long-run and short-run NARDL estimates.

2.2.3 Endogenous Growth Theory

Endogenous growth theory provides a further explanation of how government expenditure can influence long-run economic performance. Unlike the traditional Solow framework, endogenous growth models emphasize mechanisms within the economy that can sustain productivity and growth, including human capital, knowledge, innovation and public services (Romer, 1986; Lucas, 1988). Barro (1990) incorporates government services directly into production and shows that productive public expenditure can raise the long-run growth rate because it complements private capital.

2.2.4 Peacock-Wiseman Displacement Theory

Peacock and Wiseman's displacement theory explains changes in public expenditure through social disturbances and fiscal pressures. The theory argues that major crises can shift citizens' tolerance for taxation and public spending, leading to a displacement of the previous expenditure level to a higher plateau. Once the crisis passes, expenditure may not return fully to its former level. The theory is relevant to economies such as Nigeria where wars, oil shocks, recessions, pandemics, security crises and structural reforms have produced substantial changes in public-sector responsibilities.

2.3 Empirical Review

Udonwa and Effiong (2023) examine Nigerian public spending over 1981–2021 using an ARDL framework and find a long-run relationship among the variables. Their results indicate that recurrent expenditure has a positive and significant short-run effect on growth but a positive and insignificant long-run effect. The study therefore suggests that government expenditure may generate immediate demand-side effects without necessarily creating proportionate long-term productive gains. This distinction is directly relevant to the present study because it motivates separate examination of short-run and long-run responses.

Chiadika and Egbon (2024) report that government expenditure affects Nigerian economic performance differently across sectors, reinforcing the argument that expenditure composition matters. Their findings are consistent with the broader literature that distinguishes productive spending from expenditure that has weaker or delayed growth effects. Conversely, Effiong et al. (2026), using data covering 1996–2024 and FMOLS, report a negative but statistically insignificant long-run effect of total government

expenditure on Nigerian growth, while corruption has a significant negative effect. The result suggests that aggregate spending may fail to generate growth when institutional and implementation constraints weaken expenditure productivity.

Other recent Nigerian studies provide evidence in the opposite direction. Adebayo and Taiwo (2025) report a positive and significant effect of public spending on economic growth over 1986–2023, while Ijirshar et al. find that government expenditure significantly affects growth and that oil and non-oil revenue influence the expenditure-growth nexus. Recent research also indicates that the relationship can be asymmetric. Ijirshar et al. report short-run asymmetry in the government expenditure-growth relationship even though the long-run relationship was symmetric. This is especially relevant to the present study because it demonstrates that the response of output to expenditure shocks may differ across horizons.

Babatunde et al. (2024) extend the Nigerian evidence by examining nonlinear causal relationships among functional recurrent expenditure components and economic growth using nonlinear causality procedures. Their study highlights the importance of considering nonlinear dynamics and causality rather than relying only on linear regression coefficients. Usman et al. (2024), applying NARDL to fiscal deficit financing and economic growth, similarly demonstrate that positive and negative fiscal shocks can have different effects on Nigerian growth. Although their fiscal deficit variables are not identical to aggregate government expenditure, the study provides methodological support for the present decision to investigate asymmetric fiscal responses.

Ekpo, Daniel and Okon (2022): Ekpo et al. examined aggregate government expenditure and economic growth in Nigeria over 1981–2018 using the ARDL bounds approach. The study was motivated by the continuing debate between pro-market and anti-market views of government spending. Its aggregate formulation is particularly close to the present research, although the current study extends the analysis by allowing positive and negative expenditure shocks to have different effects.

Aliyu and Salisu (2022): Aliyu and Salisu examined the causal nexus between government expenditure and economic growth in Nigeria over 1981–2020 while accounting for structural breaks through a bootstrap ARDL framework. Their results showed that economic growth had a strong positive effect on government expenditure in both the short and long run. The finding supports Wagner's law and contrasts with a purely expenditure-led interpretation.

Umeh et al. (2022): Umeh and colleagues examined government expenditure and economic growth in Nigeria over 1981–2019 using an error-correction approach. The study was motivated by the observation that rising expenditure had not necessarily translated into commensurate improvements in infrastructure and development. The results provide evidence that the size of expenditure alone does not guarantee growth outcomes.

Ekpo (2023): Ekpo decomposed Nigerian public expenditure into domestic capital expenditure, recurrent expenditure and official development assistance for 1981–2018 and used the ARDL bounds framework. The study emphasized that the empirical results depend on expenditure composition, econometric method and period. This supports the present study's decision to control for investment and inflation while modelling aggregate expenditure dynamically.

Udonwa and Effiong (2023): Udonwa and Effiong examined Nigerian public spending over 1981–2021 using ARDL. They found a positive and significant short-run effect of recurrent expenditure but an insignificant long-run effect. The finding suggests that expenditure can stimulate activity temporarily without generating proportional long-run

productive gains, a distinction that directly corresponds to the present study's first two objectives.

Felix (2023): Felix examined government expenditure, tax revenue and economic growth in Nigeria from 1981–2022 using ARDL. Government expenditure was found to have no significant effect on growth at the 5% level. This result is particularly important as a contrasting study because it suggests that fiscal expansion may fail to translate into growth when spending is not sufficiently productive or when fiscal constraints weaken its transmission.

Ijirshar, Asombo, Bundepuun, Tersugh and Ngutsav (2024): Ijirshar et al. examined government expenditure and growth in Nigeria from 1981–2021 and explicitly investigated the moderating roles of oil and non-oil revenue. Their results showed that government expenditure was a significant determinant of growth and, importantly, that the relationship displayed short-run asymmetry but long-run symmetry. This is one of the closest methodological precedents for the present NARDL specification.

Chiadika and Egbon (2024): Chiadika and Egbon examined expenditure on education, agriculture and manufacturing and Nigerian growth from 2000–2023 using the ARDL bounds approach. Their results show that sectoral expenditure matters for growth, reinforcing the argument that aggregate spending figures can conceal substantial differences in the productivity of individual spending categories.

Atuma, Edeh, Agwu, Chukwuajah, Nkwagu and Udude (2024): Atuma et al. examined the relative impact of government expenditure on Nigerian economic growth over 1981–2020 using ARDL. The study contributes recent evidence from an aggregate fiscal perspective and confirms the continuing relevance of dynamic estimation in the Nigerian expenditure-growth literature.

Ofili, Saheed and Oladipo (2023/2024): Ofili et al. investigated Nigerian growth and government capital expenditure over 1981–2020 using ARDL, focusing on agricultural and manufacturing/mining expenditure. They found positive and significant effects from capital expenditure in the selected sectors, reinforcing the supply-side argument that productive public investment can raise output.

Nwude, Nwaeze and Nwude (2023): Nwude et al. examined government expenditure on education, health, agriculture, pensions and gratuities, and debt servicing over 1981–2020. Their sectoral approach highlights that the effect of public spending on growth cannot be inferred solely from aggregate expenditure and that different expenditure functions may transmit through different channels.

Usman, Agunbiade and Akuso (2024): Usman et al. applied NARDL to public budget-deficit financing and economic growth in Nigeria over 1986–2021. Although the study focused on deficit financing rather than aggregate expenditure, its finding that positive and negative fiscal shocks can have different effects provides methodological support for the nonlinear specification used in the present study.

Okechukwu (2026): Okechukwu examined government expenditure and Nigerian economic growth over 1981–2024 using the ARDL bounds-testing framework. The study reported a long-run relationship among government expenditure, growth and other conditioning variables. Its recent sample is particularly useful for positioning the present study within the post-2020 Nigerian fiscal environment, while the present research differs by explicitly modelling expenditure asymmetry.

Effiong, Udonwa and George (2026): Effiong et al. used annual Nigerian data from 1996–2024 and FMOLS to examine government expenditure and economic growth in the presence of corruption. Total government expenditure had a negative but statistically insignificant effect, while capital expenditure was positive and recurrent expenditure negative. The study provides very recent evidence that aggregate spending may conceal divergent effects of its components.

METHODOLOGY

3.1 Research Design

This study adopts an ex-post facto research design to examine the impact of government expenditure on economic growth in Nigeria. The design is appropriate because the study relies on historical annual observations that have already occurred and cannot be manipulated by the researcher. The empirical analysis focuses on the dynamic relationship between real gross domestic product (RGDP) and government expenditure (GEXP), while gross fixed capital formation (GFCF) and inflation (INF) are included as control variables.

3.2 Nature and Sources of Data

The study uses annual time-series data for Nigeria covering 1981 to 2024. The data were compiled from the World Development Indicators (WDI) of the World Bank and the Central Bank of Nigeria (CBN) Statistical Bulletin. Where the same series was available from both sources, the series were reconciled and a consistent measurement convention was maintained throughout the sample period. The final dataset contains observations for real gross domestic product, government expenditure, gross fixed capital formation and inflation.

3.4 Model Specification

The functional form of the study is specified as:

$$RGDP_t = f(GEXP_t, GFCF_t, INF_t)$$

To examine asymmetric government expenditure effects, the conventional government expenditure term is decomposed into positive and negative partial sums. The nonlinear specification is therefore expressed as:

$$LOG(RGDP_t) = f(GEXP_t\hat{}+, GEXP_t\hat{}-, GFCF_t\hat{}+, GFCF_t\hat{}-, INF_t\hat{}+, INF_t\hat{}-)$$

where $GEXP^{+}$ and $GEXP^{-}$ represent cumulative positive and negative changes in LOG(GEXP), respectively; $GFCF^{+}$ and $GFCF^{-}$ represent cumulative positive and negative changes in GFCF; and INF^{+} and INF^{-} represent cumulative positive and negative changes in inflation.

3.6 NARDL Model

Following Shin, Yu and Greenwood-Nimmo (2014), the nonlinear ARDL model allows the dependent variable and explanatory variables to respond dynamically to positive and negative changes. In an error-correction representation, the estimated model can be written generally as:

$$\Delta LOG(RGDP_t) = \alpha + \rho\, LOG(RGDP_\{t-1\}) + \theta_1 GEXP^{+}_\{t-1\} + \theta_2 GEXP^{-}_\{t-1\} + \theta_3 GFCF^{+}_\{t-1\} + \theta_4 GFCF^{-}_\{t-1\} + \theta_5 INF^{+}_\{t-1\} + \theta_6 INF^{-}_\{t-1\} + \Sigma\varphi_i \Delta LOG(RGDP_\{t-i\}) + \Sigma\beta_i \Delta GEXP^{+}_\{t-i\} + \Sigma\gamma_i \Delta GEXP^{-}_\{t-i\} + \Sigma\delta_i \Delta GFCF^{+}_\{t-i\} + \Sigma\eta_i \Delta GFCF^{-}_\{t-i\} + \Sigma\lambda_i \Delta INF^{+}_\{t-i\} + \Sigma\mu_i \Delta INF^{-}_\{t-i\} + \varepsilon_t$$

The coefficient ρ captures the speed with which deviations from long-run equilibrium are corrected. A negative and statistically significant coefficient is required for a meaningful error-correction mechanism. The long-run asymmetric effects are obtained from the ratios of the lagged level coefficients to the error-correction coefficient, with the appropriate sign convention. The short-run effects are represented by the coefficients on the differenced positive and negative partial-sum variables.

PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

4.1 Descriptive Statistics

Table 4.1: Descriptive Statistics of the Variables, 1981–2024

Statistic	GEXP	GFCF	INF	RGDP
Mean	3,429.6494	33.6134	19.1932	39,576.6734
Median	1,122.0830	27.5698	13.1000	30,333.5800
Maximum	21,481.7900	89.3861	72.8000	80,606.5300
Minimum	9.6365	12.8688	5.4000	13,779.2600
Std. Deviation	5,023.9177	19.3497	15.5807	23,266.0913
Skewness	2.0562	1.1467	1.7578	0.4349
Kurtosis	6.9063	3.9113	5.5222	1.5543
Jarque-Bera	58.9816	11.1655	34.3230	5.2190
Probability	0.0000	0.0038	0.0000	0.0736
Observations	44	44	44	44

Source: Author's computation using EViews 13.

Table 4.1 shows substantial variation across the four variables. Government expenditure has a mean of 3,429.65 and a maximum of 21,481.79, while the median is 1,122.08. The gap between the mean and median reflects the strong expansion in public expenditure over the sample period. GFCF averages 33.61 and ranges from 12.87 to 89.39. Inflation averages 19.19 percent, with a maximum of 72.80 percent, indicating the presence of pronounced inflationary episodes. RGDP averages 39,576.67 and rises to a maximum of 80,606.53, reflecting the expansion of economic activity over time.

The positive skewness of GEXP, GFCF and INF indicates that relatively high observations occur toward the upper tail of their distributions. Their Jarque-Bera probabilities are below 0.05, so normality is rejected for these individual series. RGDP has a probability of 0.0736, so its normality hypothesis is not rejected at 5 percent. These descriptive properties concern the raw series and do not by themselves invalidate the NARDL estimation.

4.2 Unit-Root Test

Table 4.2: Augmented Dickey-Fuller Unit-Root Test Results

Variable	Level ADF	5% Critical	p-value	Decision	First Difference ADF	5% Critical	p-value	Order
LGEXP	-0.8201	-3.5208	0.9555	Non-stationary	-8.0621	-3.5208	<0.001	I(1)
GFCF	-3.3911	-3.5181	0.0659	Non-stationary	-6.2989	-3.5208	<0.001	I(1)
INF	-3.8005	-3.5208	0.0263	Stationary	—	—	—	I(0)
RGDP	-2.0583	-3.5208	0.5532	Non-stationary	-3.8855	-3.5208	0.0215	I(1)

Source: Author's computation using EViews 13.

The ADF results establish a mixed order of integration. LGEXP is non-stationary in level but stationary after first differencing, making it I(1). GFCF is also I(1), while INF is stationary in level and is therefore I(0). RGDP is non-stationary in level but becomes stationary after first differencing and is consequently I(1). Since none of the variables is I(2), the integration structure is suitable for the NARDL bounds-testing approach.

4.3 Bounds Test for Cointegration

Table 4.3: NARDL Bounds Test for Cointegration

Test statistic	Value	5% I(0)	5% I(1)	Decision
F-statistic	4.4827	2.6180	3.8630	Reject H0; cointegration exists

Source: Author's computation using EViews 13.

The bounds test produces an F-statistic of 4.4827. At 5 percent, the lower and upper critical values are 2.6180 and 3.8630. Because 4.4827 is above the upper bound, the null hypothesis of no levels relationship is rejected. This provides evidence of a long-run equilibrium relationship among economic growth, the asymmetric components of government expenditure, GFCF and inflation.

4.4 Long-Run NARDL Estimates

Table 4.4: Long-Run Asymmetric NARDL Estimates

Variable	Coefficient	Std. Error	t-Statistic	p-value	5% Decision
$LGEXP^{+}$	0.1507	0.0805	1.8715	0.0859	Not significant
$LGEXP^{-}$	0.2954	0.1275	2.3163	0.0390	Significant
$GFCF^{+}$	-0.0040	0.0044	-0.9056	0.3830	Not significant
$GFCF^{-}$	-0.0049	0.0039	-1.2489	0.2355	Not significant
INF^{+}	-0.0042	0.0012	-3.5163	0.0043	Significant
INF^{-}	0.0001	0.0012	0.0611	0.9523	Not significant

Source: Author's computation using EViews 13.

The positive government expenditure component has a positive coefficient of 0.1507, but its probability value of 0.0859 exceeds 0.05. It therefore has no statistically significant long-run effect at the 5 percent level. The negative government expenditure component is

positive and significant, with a coefficient of 0.2954 and p-value of 0.0390. Thus, the estimated long-run response differs according to the direction of the expenditure shock. Formal evidence of asymmetry, however, should be based on the Wald restriction test.

Both GFCF components are statistically insignificant in the long run. The positive and negative coefficients are -0.0040 and -0.0049, respectively. Inflation has a statistically significant negative positive-shock coefficient of -0.0042 (p=0.0043), while the negative-shock coefficient is statistically insignificant. This suggests that positive inflationary movements are associated with weaker long-run economic performance in the estimated model.

4.5 Pairwise Granger Causality Test

To complement the NARDL estimates, the study employed the Pairwise Granger causality test to examine the direction of predictive relationships among government expenditure, economic growth, gross fixed capital formation and inflation in Nigeria. The test was estimated with two lags using annual observations covering 1981–2024. The null hypothesis for each pair is that the first variable does not Granger-cause the second variable. Decisions are based on the 5 percent significance level.

Table 4.5: Pairwise Granger Causality Test

Null Hypothesis	F-Statistic	Prob.	Decision at 5%
LGEXP does not Granger Cause RGDP	2.7877	0.0745	Do not reject H_0
RGDP does not Granger Cause LGEXP	0.9484	0.3966	Do not reject H_0
GFCF does not Granger Cause RGDP	2.6183	0.0864	Do not reject H_0
RGDP does not Granger Cause GFCF	2.3351	0.1109	Do not reject H_0
INF does not Granger Cause RGDP	1.0008	0.3773	Do not reject H_0
RGDP does not Granger Cause INF	1.3212	0.2791	Do not reject H_0
GFCF does not Granger Cause LGEXP	3.2554	0.0499	Reject H_0
LGEXP does not Granger Cause GFCF	9.4517	0.0005	Reject H_0
INF does not Granger Cause LGEXP	2.3033	0.1141	Do not reject H_0
LGEXP does not Granger Cause INF	1.4009	0.2591	Do not reject H_0
INF does not Granger Cause GFCF	1.7910	0.1810	Do not reject H_0
GFCF does not Granger Cause INF	1.5026	0.2358	Do not reject H_0

Source: Author's computation using EViews 13.

Interpretation of the Pairwise Granger Causality Results

The results reported in Table 4.X provide evidence on the direction of predictive relationships among the variables included in the study. The analysis is based on two lags and the decision criterion is the 5 percent level of significance. The results show that government expenditure does not Granger-cause economic growth. The F-statistic of 2.7877 has a probability value of 0.0745, which is greater than 0.05. Accordingly, the null hypothesis that LGEXP does not Granger-cause RGDP is not rejected. In the reverse direction, RGDP also does not Granger-cause LGEXP, as indicated by an F-statistic of 0.9484 and a probability value of 0.3966. Thus, the test provides no evidence of a statistically significant Granger-causal relationship between government expenditure and economic growth in either direction at the 5 percent level.

The result for gross fixed capital formation and economic growth also shows no statistically significant predictive causality at the 5 percent level. The null hypothesis that GFCF does not Granger-cause RGDP cannot be rejected because its probability value of

0.0864 exceeds 0.05. Similarly, the null hypothesis that RGDP does not Granger-cause GFCF is not rejected, with a probability value of 0.1109. The implication is that, within the two-lag specification, past movements in gross fixed capital formation do not provide sufficient predictive information for economic growth, while past economic growth does not significantly predict gross fixed capital formation.

The relationship between inflation and economic growth is equally found to be statistically insignificant in both directions. Inflation does not Granger-cause RGDP, with an F-statistic of 1.0008 and a probability value of 0.3773. Likewise, RGDP does not Granger-cause INF, as shown by an F-statistic of 1.3212 and a probability value of 0.2791. Since both probability values are greater than 0.05, the null hypotheses are not rejected. This finding indicates that the historical information contained in inflation does not significantly improve the prediction of economic growth within the estimated two-lag framework, and economic growth does not significantly improve the prediction of inflation.

A significant bidirectional relationship is, however, observed between government expenditure and gross fixed capital formation. The null hypothesis that GFCF does not Granger-cause LGEXP is rejected at the 5 percent level because the F-statistic of 3.2554 has a probability value of 0.0499. In the reverse direction, the null hypothesis that LGEXP does not Granger-cause GFCF is also rejected, with an F-statistic of 9.4517 and a probability value of 0.0005. Therefore, the evidence points to bidirectional Granger causality between government expenditure and gross fixed capital formation. This suggests that past investment behaviour contains useful information for predicting government expenditure, while past government expenditure also contains useful information for predicting investment formation.

The finding of bidirectional predictive causality between government expenditure and GFCF is economically relevant to the study. Government expenditure can influence investment through public infrastructure, productive public capital and other expenditure that supports private and public investment. At the same time, changes in investment activity may affect government budgetary decisions and the demand for public investment. The result therefore suggests a mutually reinforcing predictive relationship between government expenditure and capital formation in Nigeria. Nevertheless, the result should be interpreted as Granger or predictive causality rather than proof of structural or philosophical causation.

Finally, no statistically significant Granger causality is found between inflation and either government expenditure or gross fixed capital formation. Inflation does not Granger-cause LGEXP because its probability value of 0.1141 exceeds 0.05, while LGEXP does not Granger-cause INF with a probability value of 0.2591. Similarly, INF does not Granger-cause GFCF and GFCF does not Granger-cause INF, with probability values of 0.1810 and 0.2358, respectively. These results indicate that the test does not provide sufficient evidence of predictive causality between inflation and the other explanatory variables at the 5 percent level.

Overall, the Granger causality results reveal that the central relationship between government expenditure and economic growth is not statistically significant in either direction within the two-lag predictive framework. However, a statistically significant bidirectional Granger causal relationship exists between government expenditure and gross fixed capital formation. This finding complements rather than substitutes the NARDL results. While the NARDL framework examines the short-run, long-run and asymmetric effects of

government expenditure on economic growth, the Granger causality test provides additional evidence concerning the direction of predictive information flows among the variables.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study

This study examined the impact of government expenditure on economic growth in Nigeria, with particular attention to the possibility that increases and decreases in government expenditure may not produce identical growth responses. The study was motivated by the continuing debate over whether public expenditure is an effective instrument for promoting economic growth in Nigeria. Although government expenditure is expected to stimulate aggregate demand, provide infrastructure and support productive activities, the growth effect ultimately depends on the composition, timing, efficiency and financing of public spending.

The study adopted an asymmetric nonlinear autoregressive distributed lag (NARDL) framework. Real gross domestic product (RGDP) was used as the measure of economic activity, while government expenditure (GEXP), gross fixed capital formation (GFCF) and inflation (INF) were included in the model. Government expenditure was decomposed into positive and negative partial-sum changes so that the analysis could distinguish the effect of expenditure increases from the effect of expenditure reductions. Annual Nigerian data covering 1981–2024 were used for the descriptive and preliminary analyses, while the estimated NARDL model was based on the effective estimation sample of 1985–2024.

The unit-root results indicated that the variables were a mixture of stationary and first-difference stationary series, with none requiring second-order integration for the NARDL specification. The bounds test produced an F-statistic of 4.483, exceeding the 5 percent upper-bound critical value of 3.863. This established a long-run relationship among economic growth and the explanatory variables. The error-correction coefficient was negative and statistically significant at -0.3722 ($p < 0.001$), implying that about 37.2 percent of short-run disequilibrium is corrected within one period.

The second objective examined the short-run response. The short-run results were also asymmetric and dynamic. The contemporaneous positive expenditure shock was insignificant, but its first and second lags were negative and significant ($p = 0.0005$ and $p = 0.0028$ respectively). The contemporaneous negative expenditure component was positive and significant ($\beta = 0.2261$; $p = 0.0264$). The results therefore indicate that government expenditure can affect growth in the short run, but the response is not immediate or identical across positive and negative expenditure movements.

The third objective examined causality. The pairwise Granger test at two lags did not establish a statistically significant causal relationship from government expenditure to real GDP at the 5 percent level because the probability value was 0.0745. Reverse causality from RGDP to government expenditure was also insignificant ($p = 0.3966$). Consequently, the study does not find evidence of a Granger-causal relationship between government expenditure and economic growth at the 5 percent threshold.

5.2 Conclusion

This study concludes that government expenditure has a statistically significant relationship with economic growth in Nigeria, but the relationship is neither uniform nor purely linear.

The bounds-test evidence confirms a stable long-run relationship among the variables, while the significant error-correction coefficient demonstrates that deviations from equilibrium are corrected over time.

The long-run evidence indicates that the effect of government expenditure is asymmetric. Positive expenditure movements do not have a statistically significant long-run effect at the 5 percent level, whereas negative expenditure movements are statistically significant. The short-run estimates similarly show that the growth response depends on the direction and timing of expenditure changes. Some expenditure shocks affect growth immediately, while others operate through lagged effects.

The causality evidence provides a further qualification. Although government expenditure is statistically relevant within the NARDL relationship, the pairwise Granger test does not establish predictive causality between government expenditure and economic growth at the 5 percent level. This means that the study supports a significant dynamic relationship without claiming that government expenditure unambiguously drives economic growth in the Granger sense.

Overall, the evidence suggests that the central policy issue for Nigeria is not simply whether government spends more, but whether public expenditure is stable, productive, efficiently implemented and directed toward activities capable of generating sustainable economic capacity. The asymmetric findings imply that abrupt reductions in expenditure may have consequences that are different from those associated with equivalent increases, making expenditure management and fiscal planning important for growth performance.

5.3 Recommendations

Based on the findings, the following recommendations are proposed:

1. Government should improve the productivity and efficiency of public expenditure rather than concentrating exclusively on increasing its aggregate size. Since the positive expenditure shock was not significant in the long run, additional spending will not automatically translate into higher growth. Budgetary allocations should therefore be linked more closely to measurable outputs, completion of projects and productivity-enhancing outcomes.

2. Fiscal authorities should avoid abrupt and poorly planned reductions in productive government expenditure. The statistically significant response associated with negative expenditure shocks suggests that expenditure contractions can have important growth consequences. Where fiscal consolidation becomes unavoidable, government should protect expenditure on infrastructure, human capital, productive public services and other high-multiplier activities.

3. Government should strengthen expenditure composition and implementation. Evidence from Chandana et al. (2020) shows that capital and recurrent expenditure can have different growth effects, while the present findings show that the direction of expenditure shocks also matters. Consequently, expenditure policy should distinguish between productive investment and recurrent commitments and should prioritize projects with demonstrable economic returns. □ cite□ turn0search0□

4. Public investment planning should be strengthened. The absence of a significant independent long-run GFCF effect in the present model should not be interpreted as a reason to reduce investment. Rather, it suggests the need to improve the efficiency, quality and

implementation of investment so that public and private fixed-capital formation translates more effectively into productive capacity.

5. Fiscal policy should be designed with a medium-term perspective. The significant error-correction coefficient indicates that the Nigerian economy adjusts toward long-run equilibrium after short-run disturbances. Government should therefore avoid frequent and unpredictable fiscal reversals that can create uncertainty for households and investors.

6. Government should strengthen monitoring, transparency and accountability in public expenditure. Earlier Nigerian evidence has associated weak expenditure outcomes with the quality and composition of public spending. Stronger procurement controls, project monitoring, independent evaluation and public reporting can improve the probability that approved expenditure produces actual economic benefits.

7. Macroeconomic stability should remain part of expenditure policy. The significant long-run effect associated with positive inflation movements in the estimated model indicates that the growth consequences of fiscal policy cannot be separated completely from the broader macroeconomic environment. Fiscal expansion should therefore be coordinated with monetary and inflation-management objectives.

8. Policymakers should avoid assuming that the Keynesian proposition or Wagner's law necessarily holds continuously in Nigeria. The absence of Granger causality in the present study, together with the conflicting findings in earlier Nigerian studies, suggests that the expenditure–growth relationship is context dependent. Fiscal decisions should therefore be based on the composition, timing, financing and efficiency of expenditure rather than on a presumption of automatic causality. □ cite□ turn0search16□ turn0search8□

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