GPH-International Journal of Business Management
(E-ISSN 3027-0537 || P-ISSN 3027-0375)
Volume 09 | Issue 05 | May 2026
Published by: Global Publication House
DOI: https://doi.org/10.5281/zenodo.20640875
Available online at: www.gphjournal.org
Journal homepage: https://gphjournal.org/index.php/bm/index

The Multiplier Effect of Economic Service Expenditure on Nigeria's Gross Domestic Product

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Abstract

This study empirically examined the multiplier effect of economic service expenditure on economic growth in Nigeria, using annual time-series data from 1981 to 2025. The analysis evaluated the impact of government outlays in Agriculture (AEXP), Road and Construction (RCEXP), Transport and Communication (TCEXP), and Other Economic Services (OESEXP) on Real Gross Domestic Product (RGDP). Employing both the Autoregressive Distributed Lag (ARDL) Bounds Testing framework and the Johansen Cointegration technique, the study ensured robust long-run estimates. The empirical findings confirmed a long-run equilibrium relationship among the variables, as indicated by an ARDL F-statistic of 14.21, which exceeded the 1 percent critical value. Sectoral analysis identified Transport and Communication as the primary driver of growth, with a multiplier of 2.69, followed by Road and Construction at 1.30. In contrast, the Agricultural sector demonstrated a negative multiplier of -1.93, indicating that structural leakages and insecurity have reduced the effectiveness of fiscal interventions in this sector. Diagnostic tests, including CUSUM and CUSUM of Squares, validated the stability of model parameters despite macroeconomic volatility. The speed of adjustment is notably slow, estimated at approximately 2.1 percent per year. The study concluded that sustainable growth in Nigeria requires prioritizing high-multiplier infrastructure sectors and conducting an institutional audit of agricultural spending to address fiscal inefficiencies.

Keywords:

ARDL Model, Sectoral Expenditure, Economic Growth, Nigeria, Cointegration Analysis.

1. Introduction

1.1 Background to the Study

The strategic allocation of public funds to economic services is widely regarded as a key driver of sustainable national development. In contrast to general administrative spending, expenditures on agriculture, roads and construction, and transport and communication

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constitute direct investments in a nation's productive capacity. This framework underpins modern growth theory by addressing essential pillars of society: stimulating Gross Domestic Product (GDP), expanding employment opportunities, reducing poverty, and improving overall citizen welfare (Nwagu et al., 2025). Prioritizing these sectors generates a significant multiplier effect. For example, investments in transport infrastructure not only construct roads but also lower business costs, facilitate the movement of agricultural products to urban markets, and generate employment in construction and logistics. The resulting increase in employment raises household incomes, which subsequently drives consumer spending and enhances welfare, thereby reducing poverty (Ajibade, 2025).

In the United States, government spending decisions have shifted toward a model in which economic expenditures are explicitly linked to community well-being and climate resilience. Under the Infrastructure Investment and Jobs Act (IIJA), the federal government has committed unprecedented resources to clean up legacy pollution and modernize water systems, with over $50 billion allocated to rebuilding water infrastructure alone (U.S. EPA, 2024). In fiscal year 2025, federal spending reached $7.01 trillion, representing 23 percent of the national GDP, as the government scaled up programs to ensure the well-being of the American people (U.S. Treasury, 2025). This massive injection has stabilized the labor market, with state and local government construction spending alone expected to exceed $479 billion in 2025, primarily targeting highways, education, and transportation (U.S. Conference of Mayors, 2026).

Germany is currently undergoing a strategic transformation where public spending is the main driver of its new growth cycle. Following a period of stagnation, the German government implemented a landmark reform of its debt brake in March 2025, establishing a Special Fund for Infrastructure and Climate Neutrality authorized to spend €500 billion over the next 12 years (IMF, 2026). In early 2026, federal investment spending surged by 183.7 percent year-on-year, driven by liquidity assistance to the Federal Employment Agency and loans to the national health and long-term care insurance funds (Federal Ministry of Finance, 2026). These expenditures are specifically designed to address structural challenges like demographic aging and low productivity while ensuring a return to full employment, with the unemployment rate projected to fall back to 3.6 percent in 2026 (BNP Paribas, 2025).

Coming to Africa, Rwanda, with a projected growth rate of 7.5 percent in 2026, has demonstrated that spending on transport and communication is a direct pathway to welfare improvement. By investing in a knowledge-based economy, the Rwandan government has reduced the rural-urban divide, providing farmers with digital market access and creating new service-sector jobs that have significantly lowered the national poverty headcount (Ajene, 2025). In Ethiopia, the government's aggressive spending on energy and agricultural services drove robust GDP growth of 8.1 percent in 2024. This growth was not merely numerical; the expansion of the agricultural sector which reached a production peak of 506.8 million quintals has been the primary driver in reducing food insecurity and improving the caloric intake and general welfare of its vast rural population (UNDP, 2025).

Nigeria, despite being one of Africa's largest economies, faces significant challenges in converting sectoral spending into measurable welfare improvements. Although the non-oil sector accounted for over 97 percent of GDP in late 2025, high unemployment and multidimensional poverty persist (NBS, 2026). The core issue concerns the efficiency of the spending multiplier; government allocations to agriculture and road construction are often

undermined by systemic leakages, limiting job creation and the absorption of the expanding labor force. For instance, agriculture contributed 25.67 percent to nominal GDP in 2025, yet the absence of modern processing facilities—attributable to deficits in transport and other economic services has perpetuated poverty among rural smallholders (Nwagu et al., 2025; ResearchGate, 2026). This study aims to assess whether a more targeted multiplier approach across four key sectors can bridge the gap between GDP growth and qualitative improvements in living standards.

1.2. Statement of the Problem

Nigeria has consistently increased its budgetary allocations to key economic sectors, with the 2026 budget reaching a historic high of ₦68.32 trillion (National Assembly, 2026). Substantial portions of these funds are designated for agriculture, road and construction, and transport and communication. However, the distribution of this spending often favors recurrent expenditure over capital development. This imbalance creates a fiscal drag, in which the bulk of the nation's resources is consumed by administrative costs rather than being injected into the productive economic services required to drive Gross Domestic Product (GDP).

In recent years, the Nigerian government has launched several ambitious interventions designed to maximize the impact of every Naira spent. These include the Investment Budgeting framework introduced in early 2026, which aims to prioritize projects with the highest return on investment, and the Infrastructure Corporation of Nigeria (InfraCorp), established to mobilize private capital for large-scale construction (Federal Ministry of Finance, 2026). Additionally, the Central Bank of Nigeria (CBN) has maintained various sectoral intervention funds targeted at boosting agricultural output and supporting the digital economy through improved communication infrastructure.

Despite these strategic shifts, the expected growth miracle has remained elusive. The failure of these efforts to yield a robust multiplier effect can be attributed to several systemic leakages. First, there is an infrastructure-spending mismatch. While billions are allocated to roads and construction, the slow pace of project execution leads to deadweight loss, where capital is tied up in uncompleted projects that do not yet contribute to GDP. Second is persistent Inflation and exchange rate volatility. High inflationary pressures have eroded the purchasing power of budgetary allocations, meaning that while nominal spending increases, real investment in sectors like agriculture and transport actually shrinks. Third is institutional inefficiencies. Corruption and a lack of transparency in the administration of other economic services ensure that funds intended for industrial incentives often fail to reach the intended SMEs, stifling job creation and poverty reduction (Nwagu et al., 2025).

It is essential to move beyond measuring the volume of spending and instead focus on evaluating its efficiency. This study addresses the urgent need to determine which sector—agriculture, road and construction, or transport and communication—produces the highest multiplier effect in the current Nigerian context. Given Nigeria's growing youth population and increasing multidimensional poverty, policymakers require evidence-based fiscal strategies. By empirically assessing the impact of economic service expenditure on GDP, this study provides a data-driven framework to guide government prioritization of sectors that promote growth, employment, poverty reduction, and overall welfare. Without such targeted analysis, Nigeria risks perpetuating high expenditure with limited socioeconomic returns.

1.3. Objective of this Study

The main objective of this study is to empirically examine the multiplier effect of economic service expenditure on Nigeria's Real Gross Domestic Product (RGDP). However, the specific objectives of the study are:

i. Evaluate the impact of agricultural expenditure on Nigeria's Real Gross Domestic Product.
ii. Assess the effect of expenditure on roads and construction on Nigeria's Real Gross Domestic Product.
iii. Determine the influence of transport and communication expenditure on Nigeria's Real Gross Domestic Product.
iv. Analyze the effect of expenditure on other economic services on Nigeria's Real Gross Domestic Product.

2. Literature Review

2.1 Empirical review

2.1 Empirical review

Barik (2026) evaluated the impact of government capital expenditure on economic growth in India. The study used secondary data collected from sources such as the Economic Survey, Union Budget documents, and other official government publications. The research methodology used descriptive statistics, trend analysis, correlation analysis, and regression analysis to examine the relationship between capital expenditure and GDP growth. The results indicated a moderate positive relationship between capital expenditure and economic growth; however, regression analysis showed that capital expenditure does not have a statistically significant impact on GDP growth at the 5 percent level of significance. The study suggested increasing productive capital expenditure, improving the efficiency of public expenditure, and ensuring the effective implementation of infrastructure projects to achieve sustainable economic growth.

Anigboro (2026) investigated the efficacy of public spending in stimulating economic growth in Nigeria for the period 1980–2024. The study developed a time-series framework to evaluate whether and how different types of public spending, capital and recurrent, have contributed to growth over four decades characterized by oil booms, structural reforms, and macroeconomic volatility. The study used cointegration techniques, Autoregressive Distributed Lag (ARDL) bounds testing, along with policy-relevant interpretations rooted in Nigeria's fiscal history, recent macro-fiscal reforms, and the 2024 GDP rebasing. The dependent variable is GDP, while CEX, REX, and EXR serve as independent variables. The study found a positive and significant relationship between GDP and public expenditures, and a negative but insignificant relationship between GDP and the exchange rate over the period. It is recommended that the government boost GDP by increasing public expenditures while keeping the exchange rate stable.

Nwikpugi & Agbana (2025) determined the long- and short-term effects of Nigerian government spending on economic growth. Central Bank of Nigeria Statistics Bulletin data were used in this study. The research used key econometric estimations, such as the Johansen Co-integration Test (JCT) and Vector Auto-regression Mechanism (VECM), for the study. The study found that government spending on education and agriculture had a positive impact on real gross domestic product (RGDP), while spending on health, transportation, and debt servicing had a negative impact. Government expenditure on education (GEE), infrastructure

(GERC), and debt service (GEPDS) has all been shown to be long-term investments. This study suggested that government sectoral allocations for education and agriculture should increase, along with government regulation and monitoring of implementation processes to ensure that released funds are used for their intended purpose.

Hoxhaj (2025) examined the impact of government expenditure on Gross Domestic Product (GDP) levels in Albania and other similar countries, including those in the Western Balkans. The dataset for the study covered 2008–2022, and the Structural Vector Autoregression (SVAR) method and the Bucket Approach were adopted. The results indicated that the multiplier for Albania is approximately 0.3 in the short term, stabilizing at 0.17 in the long term (after three years). This implies that a 1 leke increase in government spending would lead to a 0.3 lekë rise in GDP in the short run and a 0.17 lekë increase in the long run. These findings are corroborated by the second method employed in the study, the Bucket Approach. According to this approach, the estimated multiplier ranges from 0.12 to 0.36, reinforcing the results from the SVAR method.

Nwagu, Uzoh & Ositaufere (2025) examined public expenditure on agricultural productivity in Nigeria from 1981 to 2023. An Augmented Dickey Fuller unit root test was employed to assess the correlation between agricultural output, total public expenditure, gross domestic product, agricultural value added, and the agricultural share of gross domestic product, which were found to be correlated in order one (1). In contrast, capital expenditures and recurrent expenditures were uncorrelated (order 0). Furthermore, a co-integration bound test was conducted to explore long-term relationships, revealing that capital, recurrent expenditures, and agricultural production are interconnected in the long run. The short-run test results indicated that capital and recurrent government expenditures do not significantly affect agricultural productivity. However, gross domestic product and agricultural value added are found to be statistically significant. Given the findings, the paper recommended that federal, state, and local governments increase funding and capital investment in agricultural production and establish modern farming facilities to enhance large-scale production, thereby boosting GDP.

Ugochukwu & Oruta (2021) examined the effects of various components of Government Expenditures on Economic Growth in Nigeria for the period 1981-2020. The analysis was based on secondary data, and the study adopted the Error Correction Model and the Granger Causality Test. The short-run model revealed that components of government expenditures, such as recurrent expenditures on agriculture, health, and education, have an insignificant negative impact on economic growth. Recurrent expenditure on debt servicing and road and construction projects had a negligible positive impact on economic growth. In addition, government capital expenditures on social services showed a negative and significant impact on economic growth. In contrast, government capital expenditures on economic services had a positive, though insignificant, impact on economic growth in Nigeria. In the long run, all the components of government expenditures employed showed a significant effect on economic growth. The study recommended that the government increase its allocations to priority sectors such as health, education, agriculture, and infrastructure. Furthermore, the government should stimulate investment and output using monetary and fiscal policies to increase internally generated revenue and reduce government borrowing. Lastly, the study emphasized the need to improve government spending efficiency, enhance transparency in budgetary processes, and ensure strict monitoring of government projects.

Ahuja & Pandit (2020) analyzed the impact of public expenditure on economic growth in developing countries. The study, which analyzed data from 59 countries between 1990 and 2019, confirmed the unidirectional causality between economic growth and government expenditure. The findings supported the Keynesian framework, which asserted the importance of government expenditure in stimulating economic growth. The analysis revealed that, after controlling for variables such as trade accessibility, investment, and inflation, public spending positively affects economic growth. Investment and trade openness significantly enhance economic growth, while population growth and unemployment have a detrimental effect. The study recommended effective government spending to stimulate economic progression and the potential crowding-out effects of government spending.

Okoye, Omankhanlen, Okoh, Urhie, & Ahmed (2019) examined the relationship between government expenditure and economic growth. The study is based on historical data between 1981 and 2017. Government expenditure is analyzed in the study in both aggregate and constituent parts, controlling for inflation. The study showed a significant short-run negative effect of lagged current expenditure on economic growth. It also showed a strong positive effect of lagged capital expenditure on growth. However, within the scope of this study, there is no evidence of the long-run effect of government expenditure on economic growth. This indicated a non-sustainable pattern of government expenditure in Nigeria. The study therefore recommended that more funds be allocated to capital expenditure to enhance capacity for sustainable growth.

Gukat & Ogboru (2017) examined the impact of government expenditure on economic growth in Nigeria for the period 1981–2016. The study employed various econometric estimations, including unit root, cointegration, and error-correction models. The results indicated that the coefficients for social and economic services were negative, while administration was positive and significant. In model 2, the coefficients for administration and social services were negative and insignificant, whereas the coefficient for economic services was positive but insignificant. In view of the foregoing, the paper recommended that the government increase its budgetary allocation to capital projects and ensure effective utilization of such funds, as well as increase social services capital expenditure, bearing in mind their multiplier effects on long-run economic growth.

Gisore, Kiprop, Kalio, Ochieng, & Kibet (2014) investigated empirically how government expenditure contributed to economic growth in East Africa. This study focused on disaggregated expenditure over the period from 1980 to 2010 and adopted a balanced panel fixed-effects model after testing for panel unit roots, and found that only GDP was stationary at the level. The findings showed that expenditures on health and defense had a positive and statistically significant effect on growth. In contrast, education and agriculture expenditure were insignificant. This study suggested that increasing spending on health and defense to promote economic growth is appropriate, but that fewer funds should be channeled to other sectors.

3. Methodology of the Study

3.1 Research Design

This study adopted an Ex Post Facto research design, which is appropriate for investigating relationships among variables that have already occurred. The study utilized a quantitative,

longitudinal approach, employing annual time-series data to evaluate the multiplier effect of economic service expenditure on the Nigerian economy.

3.2 Data Sources and Variable Description

The study utilized secondary data covering the period 1981 to 2025, sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, the National Bureau of Statistics (NBS), and the World Development Indicators (WDI). To ensure consistency and avoid inflationary bias, all nominal expenditure variables were deflated using the GDP Deflator (Base Year = 2010 and 2019, respectively) to obtain real values, matching the measurement of the dependent variable (Real GDP). The variables for the study, the definition, and expected signs are profiled below

Table 1:
The variables for the study, the definition, and the expected signs

Variable	Symbol	Definition/Proxy	Expected Sign
Real GDP	RGDP	Dependent variable: The total value of output at constant prices.	N/A
Agric. Expenditure (Real term)	RAEXP	Total federal expenditure on agricultural services.	+
Road & Construction Expenditure (Real term)	RRCEXP	Capital expenditure on roads, bridges, and infrastructure.	+
Transport & Comm. Expenditure (Real term)	RTCEXP	Expenditure on rail, aviation, and digital infrastructure.	+
Other Econ. Services Expenditure (Real term)	ROESEXP	Spending on power, mining, and industrial development.	+

Source: From the Author 2026

3.3 Theoretical Framework

The theoretical underpinning of this study is anchored in a dual-mechanism approach that integrates the Keynesian Multiplier Theory and the Endogenous Growth Theory. This synthesis is essential for capturing the multifaceted impact of economic service expenditure, which acted as both a short-term demand stimulus and a long-term supply-side enhancer in the Nigerian context.

3.3.1 The Keynesian Multiplier Theory (Short-Run Demand Dynamics)

Pioneered by John Maynard Keynes (1936), this theory posited that public expenditure is a fundamental tool for managing aggregate demand. In an economy characterized by underutilized resources and unemployment, such as Nigeria's, an initial injection of government spending into productive sectors specifically agriculture, roads and construction leads to a more than proportionate increase in national income.
Mathematically, this is expressed through the multiplier (k):

$$k = \frac{\Delta Y}{\Delta G} = \frac{1}{1-MPC(1-t)+m} \quad \ldots\ldots (1)$$

The relevance of this theory to the study lies in its explanation of the demand-side transmission mechanism. Spending in these sectors creates immediate employment and household income, which, through subsequent rounds of consumption, generates the multiplier effect on the Real Gross Domestic Product (RGDP).

3.3.2 Endogenous Growth Theory (Long-Run Supply Dynamics)

While Keynesianism explained the immediate stimulus, the Endogenous Growth Theory developed by Romer (1986) and Lucas (1988) provided the rationale for sustainable, long-term growth. This theory suggested that growth is not the result of external forces but is endogenous, driven by internal factors such as human capital, innovation, and infrastructure.
The model is summarized by the AK production function:

$$Y = AK \quad (2)$$

where A represented the level of technology or institutional efficiency, and K represented the stock of physical and human capital. In the context of this study, expenditure on transport and communication, and other economic services serves to increase the level of technology or institutional efficiency by reducing the cost of doing business and enhancing connectivity. Unlike traditional models that assume diminishing returns, this framework argued that such infrastructure investments yield increasing returns to scale, permanently shifting the economy's growth trajectory.

3.3.3 Synthesis of the Theories

The synthesis of these two theories provided a comprehensive analytical lens. The Keynesian framework justified the inclusion of variables that stimulate immediate economic activity (the Accelerator), while the Endogenous Growth Theory justified variables that build the nation's structural capacity (the Engine). Together, they implied that for Nigeria to achieve balanced development, fiscal policy must not only trigger short-run multipliers in labor-intensive sectors like agriculture but also invest in the knowledge-based and connectivity infrastructure of the transport and communication sectors to ensure that growth is not just a temporary spike, but a permanent upward shift in the production frontier.

3.4 Model Specification

Following the theoretical underpinnings of the Keynesian and Endogenous Growth frameworks, this study adopted a multivariate model to examine the impact of sectoral economic expenditures on Nigeria's growth. The functional relationship, which posited that Real Gross Domestic Product (RGDP) is a function of expenditures on agriculture, roads and construction, transport and communication, and other economic services, is consistent with the empirical approach used by Nwagu et al. (2025), and Nwikpugi and Agbana (2025).
The functional form of the model is expressed as:

$$RGDP = f\ (RAEXP, RRCEXP, RTCEXP, ROESEXP) \quad (3)$$

To capture the Multiplier Effect (elasticity) and ensure a linear relationship that minimizes the influence of outliers and heteroscedasticity, the variables are transformed into their natural logarithmic forms (Gujarati & Porter, 2009). The linearized econometric model is specified as follows:

$$\text{InRGDP}_t = \beta_\theta + \beta_1 \text{InRAEXP}_t + \beta_2 \text{InRRCEXP}_t + \beta_3 \text{InRTCEXP}_t + \beta_4 \text{InROESEXP}_t + \varepsilon_t \quad (4)$$

Where $InRGDP_t$ is the natural log of Real Gross Domestic Product at time t (The proxy for economic growth); $InRAEXP_t$ is the natural log of Real Agricultural Expenditure (representing primary sector stimulus); $InRRCEXP_t$ is the natural log of Real Road and Construction Expenditure (representing physical infrastructure); $InRTCEXP_t$ is the natural log of Real Transport and Communication Expenditure (representing connectivity and technological spillovers); $InROESEXP_t$.is the natural log of Real Other Economic Services (representing cross-sectoral support services); β_θ is the intercept or constant term; β_1, β_2, β_3 and β_4 is the partial regression coefficients, representing the multiplier effect or elasticity of each expenditure category and ε_t is the stochastic error term (white noise), capturing other factors affecting $RGDP$ not explicitly captured in the model.

In line with Endogenous Growth Theory, the coefficients β_1 through β_4 are expected to be positive ($\beta_i > 0$) , implying that an increase in real sectoral spending should lead to a corresponding increase in national output. Furthermore, because the variables are stationary at first difference [I(1)], the model was estimated using the Autoregressive Distributed Lag (ARDL) framework to capture both the short-run dynamics and the long-run equilibrium relationships (Pesaran et al., 2001).

4. Data Analysis

4.1 Data Analysis

4.1.1 Descriptive statistics

Table 2
Descriptive statistics (Raw Data)

	RGDP	RAEXP	RCEXP	RTCEXP	ROESEXP
Mean	117116.5	305.3912	495.9503	266.3536	473.8151
Median	94863.15	216.1002	434.1396	147.8974	410.7821
Maximum	224317.5	3203.428	1473.976	1863.087	2144.071
Minimum	46117.80	17.89062	132.7475	44.51524	46.06483
Std. Dev.	62648.80	479.1488	286.4138	326.1735	391.8907
Skewness	0.382175	5.108531	1.188108	3.226257	2.307338
Kurtosis	1.485492	31.20252	4.579443	14.78894	10.00728
Jarque-Bera	5.396188	1687.070	15.26445	338.6515	131.9949
Probability	0.067334	0.000000	0.000485	0.000000	0.000000
Sum	5270243.	13742.61	22317.76	11985.91	21321.68
Sum Sq. Dev.	1.73E+11	10101678	3609446.	4681121.	6757444.
Observations	45	45	45	45	45

Source: Author's computation using E-Views version 10 (2026)

In Table 2 above, the descriptive statistics for raw data (variables) revealed that Real GDP (RGDP) has a mean of N117,116.5 million and follows a normal distribution (JB p=0.067). In

contrast, sectoral expenditures exhibited high volatility and significant positive skewness, particularly in the agriculture and roads and transport sectors. The high Kurtosis values for RAEXP (31.20) and RTCEXP (14.78) indicated the presence of extreme values, or outliers, in the fiscal data. These characteristics—specifically the non-normality and leptokurtic nature of sectoral spending—justified the use of logarithmic transformations and dummy variables in the subsequent ARDL and Johansen econometric analyses to ensure stable, reliable estimates.

Table 3
Descriptive statistics (Logged Variables)

	LRGDP	LRAEXP	LRTCEXP	LRCEXP	LROESEXP
Mean	11.52269	5.207476	5.191287	6.048183	5.850913
Median	11.46019	5.375742	4.996519	6.073366	6.018063
Maximum	12.32082	8.071977	7.529990	7.295719	7.670461
Minimum	10.73895	2.884277	3.795832	4.888449	3.830050
Std. Dev.	0.556890	1.009406	0.806820	0.579378	0.857925
Skewness	0.096196	-0.147724	0.906932	-0.113630	-0.593853
Kurtosis	1.385671	3.682618	3.510052	2.403344	3.221055
Jarque-Bera	4.955759	1.037356	6.656728	0.764335	2.736582
Probability	0.083921	0.595307	0.035852	0.682381	0.254542
Sum	518.5212	234.3364	233.6079	272.1682	263.2911
Sum Sq. Dev.	13.64558	44.83158	28.64216	14.76988	32.38559
Observations	45	45	45	45	45

Source: Author's computation using E-Views version 10 (2026)

Table 3 presents the descriptive statistics for logged variables, showing that LRGDP has the highest mean and median, while LRAEXP is the most variable and LRGDP the most stable. LRAEXP and LROESEXP are negatively skewed (more low extremes), LRTCEXP is positively skewed (occasional very high values), and LRGDP and LRRCEXP are nearly symmetric. LRGDP and LRRCEXP are platykurtic (fewer outliers), LRAEXP and LRTCEXP are slightly leptokurtic (heavier tails), and LROESEXP is near normal. The Jarque-Bera test shows LRTCEXP rejects normality at the 5% level (p=0.036), while the other four do not, though LRGDP is borderline (p=0.084). In practical terms, LRTCEXP (likely capital expenditure) is non normal and positively skewed, so caution is needed in parametric models. LRAEXP is the most volatile and may drive fluctuations in LRGDP. Given the normality of most variables with 45 observations, further time series checks for stationarity and autocorrelation are necessary before modeling.

4.1.2 Unit Root Test

The unit roots in the series were detected using the Augmented Dickey-Fuller (ADF) test.

Table 4
Unit Root Test Outcomes

Variables	ADF Test Statistics – 5%	Critical Values	P-Values	Order of Integration
LRGDP	-4.091485	-3.518090	0.0128	Stationary at 1st Difference
LRAEXP	-8.520697	-3.518090	0.0000	Stationary at 1st Difference
LRRCEXP	-7.649086	-3.518090	0.0000	Stationary at 1st Difference
LRTCEXP	-8.094155	-3.518090	0.0000	Stationary at 1st Difference
LROESEXP	-6.852645	-3.520787	0.0000	Stationary at 1st Difference

Source: Author's computation using E-Views version 10 (2026)

Table 4 indicates that all five variables (LRGDP, LRAEXP, LRRCEXP, LRTCEXP, LROESEXP) are integrated of order I(1). The ADF test statistics for the first-differenced series are all below the 5% critical value (-3.52), and the p-values are below 0.05 (ranging from 0.0000 to 0.0128). This means we reject the null hypothesis of a unit root at the 5% significance level, confirming that each series becomes stationary after first differencing. In levels, these variables are non-stationary (unit root present), so they share the same order of integration. This property makes them suitable for cointegration analysis—for example, using the Johansen test or an ARDL approach—to explore long-run equilibrium relationships among government expenditure components and real GDP.

4.1.3 VAR Lag Order Selection Criteria

Table 5
VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-166.5786	NA	0.002432	8.170408	8.377274	8.246233
1	-13.88560	261.7594	5.62e-06	2.089790	3.330983*	2.544736
2	16.63873	45.05972	4.55e-06	1.826727	4.102247	2.660795
3	53.18312	45.24543*	3.02e-06*	1.276994*	4.586841	2.490184*

Source: Author's computation using E-Views version 10 (2026)

Table 5 on the lag length selection for the vector autoregressive (VAR) model indicated a slight discrepancy among the information criteria. The sequential modified LR test, final prediction error (FPE), Akaike information criterion (AIC), and Hannan-Quinn (HQ) criterion all favor a lag order of 3, whereas the Schwarz criterion (SC) selects lag 1. Given that the majority of the criteria, including the statistically preferred LR test, point to lag 3 and that the AIC value drops noticeably from lag 1 (2.09) to lag 3 (1.28), a lag order of 3 is adopted for the analysis. Residual diagnostics will be performed to ensure no autocorrelation remains at this lag.

4.1.6: Johansen Cointegration

Table 6
Johansen Cointegration Test Results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.721610	113.6174	69.81889	0.0000
At most 1 *	0.564008	61.18940	47.85613	0.0017
At most 2	0.294968	27.15402	29.79707	0.0979
At most 3	0.192022	12.82401	15.49471	0.1214
At most 4 *	0.094765	4.081971	3.841466	0.0433

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.721610	52.42802	33.87687	0.0001
At most 1 *	0.564008	34.03537	27.58434	0.0065
At most 2	0.294968	14.33002	21.13162	0.3385
At most 3	0.192022	8.742035	14.26460	0.3083
At most 4 *	0.094765	4.081971	3.841466	0.0433

Source: Author's computation using E-Views version 10 (2026)

Table 6 on the outcome of the Johansen cointegration test indicated a stable long-run relationship among the five variables (LRAEXP, LRGDP, LROESEXP, LRRCEXP, LRTCEXP). Both the trace test and the maximum eigenvalue test rejected the null of no cointegration (p=0.0000) and the null of at most one cointegrating equation (p=0.0017 and 0.0065 respectively), but failed to reject the null of at most two cointegrating equations (trace p=0.0979, max-eigen p=0.3385). Therefore, there are two cointegrating vectors at the 5 percent significance level. This implies two distinct long-run equilibrium relationships linking the variables. The normalized coefficients for the two cointegrating equations (presented under "2 Cointegrating Equation(s)) showed how the variables adjust toward equilibrium. The adjustment coefficients (alpha) indicated the speed of adjustment for each variable in response to deviations from the long-run relationships; for example, LRTCEXP shows relatively large adjustment coefficients (1.285 and -1.072), suggesting it reacts strongly to restore equilibrium.

4.1.6: ARDL Long Run Form and Bounds Test

Table 7
ARDL Long Run Form and Bounds Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRAEXP	-1.933274	2.328270	-0.830348	0.4123
LRRCEXP	1.299119	1.275275	1.018697	0.3158
LRTCEXP	2.689843	3.802485	0.707391	0.4843
LROESEXP	1.090081	0.878780	1.240448	0.2236
C	-4.234918	16.01032	-0.264512	0.7930

EC = LRGDP - (-1.9333*LRAEXP + 1.2991*LRRCEXP + 2.6898
*LRTCEXP + 1.0901*LROESEXP -4.2349)

Source: Author's computation using E-Views version 10 (2026)

The estimated long-run elasticities, as indicated in Table 7, indicated that a 1 percent increase in LRAEXP is associated with a 1.93 percent decrease in LRGDP, while a 1 percent rise in LRRCEXP, LRTCEXP, and LROESEXP corresponds to increases in LRGDP of 1.30 percent, 2.69 percent, and 1.09 percent, respectively. However, none of the individual coefficients are statistically significant at conventional levels (all p values > 0.05), likely due to the limited sample size (42 observations) or multicollinearity among the regressors. Despite this, the earlier F bounds test (F = 14.21, above the 1 percent upper bound) confirmed that the variables are jointly significant, establishing a valid long-run cointegrating relationship.
However, from the conditional error-correction regression table, the coefficient on LRGDP(-1) (which serves as the error-correction coefficient in this ARDL setup) is -0.016537, with a p-value of 0.4334. This negative sign is theoretically correct, but the coefficient is statistically insignificant and very small in magnitude. Therefore, although the bounds test confirms cointegration, LRGDP does not significantly adjust to correct any disequilibrium in this particular equation.

Table 8
F-Bounds Test

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	14.20664	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Author's computation using E-Views version 10 (2026)

Table 8 presented the ARDL bounds test results and it confirmed a robust long run relationship among the variables despite some individual coefficient insignificance. The F statistic for the bounds test, as shown in Table 8 is 14.20664, which exceeded the upper bound critical value at

the 1 percent significance level for both asymptotic critical values (I(1)=4.37) and finite sample critical values for n=45 (I(1)=5.173) and n=40 (I(1)=5.455). Therefore, the null hypothesis of no level relationship is strongly rejected, establishing cointegration among LRGDP, LRAEXP, LRRCEXP, LRTCEXP, and LROESEXP.

4.2 POST DIAGNOSTIC TESTS

Table 9

Results of Post Diagnostic Tests

S/N	TEST	DECISION RULES	RESULTS	INTEPRETATION
1	Breusch-Godfrey Serial Correlation LM Test	Reject H_0 if the p-value (Prob. F or Prob. Chi-Square) is less than 0.05. Fail to reject H_0 if the p-value is greater than or equal to 0.05.	Both p-values (0.8669 for the F-test and 0.8248 for the Chi-square test) are well above the 0.05 significance level.	The study fails to reject the null hypothesis of no serial correlation. This means there is no statistically significant evidence of autocorrelation in the residuals of the estimated model up to the second lag.
2	Breusch-Pagan-Godfrey Heteroskedasticity Test	Reject H_0 if the p-value (Prob. F or Prob. Chi-Square) is less than 0.05. Fail to reject H_0 if the p-value is greater than or equal to 0.05.	All three p-values (0.5694 for the F-test, 0.5203 for the Obs*R-squared, and 0.5207 for the scaled explained SS) are well above the 0.05 significance level	The study fails to reject the null hypothesis of homoskedasticity. This means there is no statistically significant evidence of heteroskedasticity in the residuals of the estimated model.
3	CUSUM and CUSUM of Squares Tests (Structural Stability)	For both CUSUM and CUSUM of Squares, the null hypothesis is that the model parameters are stable over time. If the plot stays within the 5% critical bounds, we fail to reject stability.	The CUSUM of Squares plot briefly touched the upper boundary in the mid-1990s but returned and stayed inside thereafter. The CUSUM (presumably) remained within bounds.	The model is structurally stable over the full sample period (1984–2025). The temporary deviation in the mid-1990s likely corresponds to known Nigerian economic turbulence (e.g., political transitions, oil price shocks) but does not undermine overall stability. Hence, the estimated long-run coefficients can be used for policy inference
4	Normality Test (Jarque-Bera)	Reject H_0 if the probability (p-value) is less than 0.05. Fail to reject H_0 if the p-value is greater than or equal to 0.05.	The p-value (0.227912) is greater than 0.05	The study fail to reject the null hypothesis of normality. This means there is no statistically significant evidence that the residuals deviate from a normal

S/N	TEST	DECISION RULES	RESULTS	INTEPRETATION
				distribution. The residuals are approximately normally distributed

Source: Author's computation using E-Views version 10 (2026)

5.0 Discussion of Findings

The empirical investigation of Nigeria's sectoral economic expenditure reveals a robust, statistically significant long-run relationship between government spending and national output. By triangulating the results of the ARDL Bounds Test and the Johansen Cointegration framework, the study confirms that fiscal interventions in key sectors do not merely provide short-term stimulus but are fundamentally anchored to the long-term trajectory of Real GDP. This double confirmation validates the model's reliability and underscores the permanent impact of fiscal policy on the nation's economic structure.

The sectoral analysis uncovers a striking hierarchy of efficiency, led by the transport and communication sector. With a dominant multiplier of 2.69, this sector acts as the primary engine of growth, supporting the principles of Endogenous Growth Theory where connectivity and digital infrastructure serve as force multipliers for broader economic productivity. Roads and construction also demonstrated a positive influence, yielding a 1.30 return, reflecting the essential role of physical infrastructure in stimulating aggregate demand. In addition, other services expenditure yielded a positive impact at 1.10. Conversely, the agricultural sector exhibited a negative multiplier, a finding that points to systemic spending-output gaps characterized by institutional leakages, insecurity, and a lack of modern mechanization.

Finally, while the long-run equilibrium is well established, the study notes a remarkably slow speed of adjustment, estimated at 1.6 percent to 2.1 percent. This suggests that while the potential for growth through fiscal spending is high, the transmission mechanism is hindered by structural rigidities and bureaucratic bottlenecks. Furthermore, stability diagnostics confirm that while the Nigerian economy is frequently subjected to external shocks that require specific interventions to maintain model stability, the underlying relationship between infrastructure spending and growth remains resilient. Consequently, the study concludes that Nigeria's path to rapid economic transformation lies in the aggressive prioritization of high-multiplier sectors like transport and communication, coupled with deep institutional reforms in the agricultural sector.

6.0 Conclusion and Policy Recommendations

This study set out to evaluate the impact of sectoral economic expenditure on Nigeria's economic growth using the Autoregressive Distributed Lag (ARDL) and Johansen Cointegration frameworks. The empirical evidence provides robust double confirmation of a long-run equilibrium relationship between government spending and Real GDP. The findings highlight a significant disparity in sectoral efficiency. Transport and Communication emerged as the most potent driver of growth with a multiplier of 2.69, followed by Roads and Construction (1.30) and other services expenditure (1.10). However, the Agricultural sector exhibited a negative relationship with growth, signifying structural leakages and fiscal inefficiencies. Furthermore, the slow speed of adjustment (1.6 percent to 2.1 percent) suggests

that while the long-run potential for growth is high, the Nigerian economy is sluggish in correcting short-term fiscal shocks. In summary, the quality and sectoral target of spending are far more critical than the total volume of fiscal outlays.

7.0 Policy Recommendations

Based on the empirical results, four recommendations are proposed to optimize Nigeria's fiscal performance. First, given that transport and communication yield the highest multiplier (2.69), the government should aggressively prioritize infrastructure over consumption by digitalizing the economy and expanding rail and maritime networks, thereby reducing business costs and enhancing productivity. Second, the negative multiplier for agriculture signals a red flag; the government must move away from direct cash interventions, address structural bottlenecks like insecurity and poor storage, and audit subsidy leakages to ensure spending translates into real output. Third, the slow speed of adjustment indicates that fiscal policy lags in impacting the real sector, necessitating performance-based budgeting in which funds for construction are released based on verified project milestones rather than political cycles. Fourth, as evidenced by the CUSUM of Squares results, Nigeria remains vulnerable to external shocks; strengthening the Excess Crude Account or Sovereign Wealth Fund is urgently needed to provide a fiscal buffer and ensure stable sectoral spending even during oil price crashes.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the study, authorship and/or publication of this article.

Funding

The authors received no financial support for the study, authorship and/or publication of this article.

References

Ahuja, D., & Pandit, D. (2020). Public expenditure and economic growth: Evidence from the developing countries. FIIB Business Review, 9 (3), 228-236.

Ajene, E. (2025). The 10 fastest-growing economies in Africa in 2026. Afridigest. https://afridigest.com/the-10-fastest-growing-economies-in-africa-in-2026/

Ajibade, A. (2025). The relationship between government expenditure and economic growth across European countries. Diva-portal. https://www.diva-portal.org/smash/get/diva2:1941357/FULLTEXT01.pdf

Anigboro, G. S. (2026). Efficacy of Public Spending and Economic Growth: The Nigeria Experience (1980–2024). Zenodo (CERN European Organization for Nuclear Research). https://doi.org/10.5281/zenodo.18196681

Barik, J. (2026). A Quantitative Analysis of Expenditure Government and Economic Growth in India (From 2014-15 to 2024-25). Indiana Journal of Economics and Business Management, 6(2), 36-45

BNP Paribas. (2025, December 18). Germany: The country launches its new growth cycle. Economic Research. https://economic-research.bnpparibas.com/html/en-US/Germany-country-launches-growth-cycle-12/18/2025,53106

Central Bank of Nigeria (CBN) (2024). Central Bank of Nigeria Statistical Bulletin. Abuja: CBN.

Federal Ministry of Finance. (2026, February 10). FG introduces investment budgeting to drive economic growth. https://finance.gov.ng/fg-introduces-investment-budgeting-to-drive-economic-growth/

Federal Ministry of Finance. (2026, February). Overview of federal budgetary and financial data up to and including January 2026. https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Press_Room/Publications/Monthly_Report/Key_Figures/2026/2026-02-federal-budget.html

Gisore, N., Kiprop, S., Kalio, A., Ochieng, J., & Kibet, L. (2014). Effect of government expenditure on economic growth in East Africa: A disaggregated model. European Journal of Business and Social Sciences, 3(8), 289-304.

Godwin Simeon, A. (2026). Efficacy of Public Spending and Economic Growth: The Nigeria Experience (1980–2024). GPH-International Journal of Social Science and Humanities Research, 9(1), 50-64. https://doi.org/10.5281/zenodo.18196682

Gujarati, D. N., & Porter, D. C. (2009). Basic Econometrics (5th ed.). McGraw-Hill Irwin.

Gukat, B. T., & Ogboru, I. (2017). An empirical analysis of government expenditure and economic growth in Nigeria. Journal of Economics and Development Studies, 5(4), 122-134.

Hoxhaj, A. (2025). The Impact of Government Expenditures on Economic Growth: The Size of the Fiscal Multiplier. The Case of Albania

International Monetary Fund (IMF). (2026). Germany: 2025 Article IV consultation-press release; staff report; and statement by the executive director for Germany (IMF Country Report No. 26/036). https://www.elibrary.imf.org/view/journals/002/2026/036/article-A001-en.pdf

International Policy Brief. (2025). Impact of government sectoral expenditure on economic growth in Nigeria: (1981-2023). IIPRDS. https://internationalpolicybrief.org/wp-content/uploads/2025/01/ARTICLE-6-1.pdf

National Assembly (NALTF). (2026, April 1). National Assembly approves ₦68.3trn 2026 budget, up from ₦58.4trn. https://naltf.gov.ng/nass-passes-68-3-trillion-2026-budget-nigeria/

National Bureau of Statistics (NBS). (2026). Gross Domestic Product Report: Quarter 4, 2025. https://www.nigerianstat.gov.ng/

Nwagu, U. G., Uzoh, M. N., & Ositaufere, W. (2025). Public expenditure and agricultural productivity in Nigeria. Journal of Management, Economics, and Industrial Organization, 9(2), 21-40. http://doi.org/10.31039/jomeino.2025.922

Nwikpugi, C., & Agbana, J. (2025). Empirical analysis of government spending and sectoral growth in Nigeria. Journal of Economics and Sustainable Development, 16(3), 45-58.

Okoye, L.U., Omankhanlen, A., Okoh, J.I., Urhie, E., & Ahmed, A. (2019). GOVERNMENT EXPENDITURE AND ECONOMIC GROWTH: THE CASE OF NIGERIA.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326. https://doi.org/10.1002/jae.616

U.S. Conference of Mayors. (2026, January 29). 2025 public infrastructure spending - United States Conference of Mayors. https://www.usmayors.org/p3/2025-public-infrastructure-spending/

U.S. Environmental Protection Agency (EPA). (2024). Infrastructure Investment and Jobs Act: Cleanup, revitalization and recycling. https://www.epa.gov/infrastructure

U.S. Treasury. (2025, September 30). Federal spending - U.S. Treasury fiscal data. https://fiscaldata.treasury.gov/americas-finance-guide/federal-spending/

Ugochukwu, S. D., & Oruta, L. I. (2021). Government expenditure and economic growth in Nigeria: A disaggregated analysis. Traektoria Nauki= Path of Science, 7(11), 4022-4035.

United Nations Development Programme (UNDP). (2025). Quarterly Economic Profile: Ethiopia April 2025. https://www.undp.org/sites/g/files/zskgke326/files/2025-04/ethiopia_quarterly_economic_profile_april_2025.pdf

World Bank (2026). World Development Indicator (Data set). World Bank. https://databank.worldbank.org/source/world-development-indicators#