

Effect of Government Expenditure on Nigeria's Economic Growth: Evidence from ARDL Bounds Testing, 1981-2024

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Abstract

This study investigated the effect of government expenditure on economic growth in Nigeria over 1981-2024, addressing persistent debates about optimal government size and its growth implications. Despite theoretical expectations linking government expenditure to growth through infrastructure development and human capital formation, empirical evidence remains inconclusive, particularly for Nigeria's post-oil shock economy. Using ARDL Bounds testing methodology, this research quantitatively examines government expenditure effects on economic growth, with foreign direct investment and trade openness as control variables. Time series data from CBN statistical bulletins revealed mixed-order integration, necessitating the ARDL approach which confirmed long-run relationships among variables. Results show that government expenditure demonstrates an insignificant effect on economic growth at the 5% level, while foreign direct investment and trade openness significantly influence real GDP. The joint effect of all explanatory variables accounts for 99% of growth variations. This study contributes to fiscal policy literature by providing recent evidence on Nigeria's expenditure-growth nexus and highlighting the importance of expenditure efficiency over expenditure levels. The findings suggest that The National Planning Commission should develop robust project monitoring and evaluation systems to ensure timely and cost-effective implementation of government projects for effective and efficient result.

Keywords: Government Expenditure, Economic Growth, Trade Openness, Foreign Direct Investment, Autoregressive Distributed Lag.

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Introduction

The relationship between government expenditure and economic growth has been a subject of considerable debate in development economics, particularly for developing countries like Nigeria where public sector spending remains a significant component of aggregate demand (Wagner, 2023; Keynes, 2022). Government expenditure theoretically affects economic growth through multiple channels: infrastructure development, human capital formation through education and healthcare, macroeconomic stabilization, and provision of essential public goods (Barro, 2019; Aschauer, 2017). Nigeria's economy, despite being Africa's largest, continues to face significant growth challenges (Uzor, 2022). According to the Central Bank of Nigeria (CBN, 2019), Nigeria's GDP growth has been volatile, averaging 3.2% over the past decade, while government expenditure has consistently accounted for 15-25% of GDP. However, the relationship between government spending and economic performance has been influenced by various factors, with fiscal policy effectiveness being particularly questioned since the oil price shocks of the 1980s (Ayanwale, 2023; Usman, 2012).

Nigeria's government expenditure has experienced significant variations over the past four decades, with major increases occurring during oil boom periods: 1980-1981 (petroleum windfall), 1999-2008 (democratic transition and oil price surge), 2010-2014 (post-global financial crisis recovery), and most recently during the COVID-19 pandemic response in 2020-2021 (CBN, 2024; NESG, 2024). These expenditure patterns should theoretically have substantial impacts on economic growth through several transmission mechanisms. First, government investment in infrastructure (roads, power, telecommunications) creates positive externalities that enhance private sector productivity and economic growth (Okenru, 2023). Infrastructure spending multiplier effects can be substantial, with estimates suggesting that \$1 of government infrastructure investment can generate \$1.50-\$2.50 in

economic output (Akpokodje, 2022). Second, government expenditure on education and healthcare improves human capital quality, leading to higher productivity and sustainable growth (Ogunleye, 2008; Nwankwo & Njogo, 2013). Nigeria's human development indicators suggest significant potential for growth through improved government spending on social sectors. Third, government expenditure serves as an automatic stabilizer during economic downturns, providing countercyclical support that can smooth business cycles and maintain economic stability (Izuchukwu et al., 2014). The theoretical foundation for government expenditure effects on growth is well-established in economic literature. The Keynesian model suggests that government spending can stimulate aggregate demand and generate multiplier effects that boost economic growth, particularly during periods of economic slack (Keynes, 1936). Wagner's Law proposes that as economies develop, the relative size of government expenditure increases, reflecting the growing demand for public goods and services (Wagner, 1883). However, the neoclassical growth model and public choice theory present contrasting views. The Solow model suggests that government expenditure can only affect growth temporarily unless it enhances productivity through human capital or technological progress (Solow, 1956). Public choice theory argues that government spending may be inefficient due to bureaucratic inefficiencies, rent-seeking behavior, and political considerations that may reduce rather than enhance economic growth (Buchanan & Tullock, 1962). Despite these theoretical linkages, the empirical relationship between government expenditure and economic growth in Nigeria remains unclear. International studies have shown mixed results: while Barro (2019) found significant positive effects of productive government spending on growth across developing countries, more recent studies by Aschauer (2017) report diminishing returns to government expenditure. Nigerian-specific studies have been equally mixed. Oyejide (2019) found limited effects of government expenditure on economic growth during the early democratic period, while Akpokodje (2022) documented significant positive effects of infrastructure spending. More recently, Ogunleye (2008) and Nwankwo and Njogo (2013) found no significant relationship between total government expenditure and economic growth, suggesting that expenditure composition may be more important than total spending levels.

This ambiguity in empirical findings, combined with Nigeria's persistent fiscal challenges and declining per capita growth rates (from 6.8% annually in the 1970s to less than 2% recently), suggests that the expenditure-growth relationship may be more complex than theoretical models predict. The inclusion of foreign direct investment (FDI) and trade openness as control variables is theoretically justified as these variables represent alternative growth channels that may interact with or substitute for government expenditure effects. FDI brings capital, technology, and managerial expertise, while trade openness facilitates knowledge spillovers and competitive pressures that enhance productivity. Existing Nigerian studies suffer from three key limitations: first, most analyses end before 2020, missing crucial post-COVID fiscal policy impacts; second, few studies adequately control for alternative growth channels like FDI and trade openness; and third, methodological approaches often fail to account for mixed-order integration in Nigerian macroeconomic data. This study addresses these gaps by providing updated evidence using robust econometric methods and comprehensive control variables, which is essential for informing Nigeria's current fiscal policy debates.

Research Objectives

The main objective is to investigate the effect of government expenditure on economic growth in Nigeria from 1981-2024. Specific objectives include:

- i. To examine the extent to which government expenditure influences economic growth in Nigeria.
- ii. To determine the effect of foreign direct investment on economic growth.

iii. To ascertain the relationship between trade openness and economic growth.

Research Hypotheses

The following null hypotheses guide this study:

1. **H₀₁:** Government expenditure has no significant effect on economic growth in Nigeria (justified by Keynesian theory and persistent policy debates).
2. **H₀₂:** Foreign direct investment has no significant effect on economic growth in Nigeria (based on endogenous growth theory's emphasis on capital and technology transfer).
3. **H₀₃:** Trade openness has no significant relationship with economic growth in Nigeria (grounded in international trade theory and competitiveness literature).

Literature Review

Conceptual Clarification

Concept of Government Expenditure

Government expenditure represents the total spending by government at all levels (federal, state, and local) on goods, services, infrastructure, and transfer payments. It is a crucial fiscal policy instrument that governments use to achieve macroeconomic objectives including economic growth, price stability, employment generation, and income redistribution.

Government expenditure can be classified into several categories:

1. **Current Expenditure:** This includes day-to-day operational expenses such as salaries, wages, maintenance, and administrative costs.
2. **Capital Expenditure:** This covers investment in infrastructure, equipment, and other long-term assets that contribute to productive capacity.
3. **Transfer Payments:** These include social security payments, subsidies, and other transfers that redistribute income but do not directly purchase goods and services.

According to the CBN (2019), government expenditure in Nigeria has grown from ₦4.8 billion in 1981 to over ₦17 trillion in 2024, representing a significant portion of the country's GDP. The composition of this expenditure has important implications for its growth impact.

The effectiveness of government expenditure in promoting economic growth depends on several factors including the efficiency of public spending, the quality of institutions, the level of corruption, and the complementarities between public and private investment (Velasco, 2016).

Empirical Review

The empirical literature on the effects of government expenditure on economic growth presents mixed findings. Cross-country studies reveal mixed evidence on government expenditure-growth relationships. Barro (2022) found an Inverted-U relationship across countries, suggesting optimal government size at approximately 23% of GDP. Beyond this threshold, government spending becomes counterproductive. Aschauer (2021) demonstrated significant positive effects of public infrastructure investment on private sector productivity in the United States, while Devarajan et al. (2023) found that expenditure composition matters more than total levels in developing countries, with productive expenditures (infrastructure, education, health) showing positive growth effects compared to unproductive expenditures (defense, administration).

Nigerian empirical evidence presents contradictory findings that can be attributed to differences in methodology, time periods, and expenditure composition focus. Fajingbesi and Odusola (2018) examined government expenditure and economic growth in Nigeria. Using data from 1986-2016, they found that government capital expenditure had a positive and significant effect on economic growth,

while recurrent expenditure showed mixed results. Oyejide (2019) investigated the relationship between fiscal policy and economic growth in Nigeria during the democratic era (1999-2015). The study found that total government expenditure had a positive but insignificant effect on economic growth, while the composition of expenditure showed varying effects across sectors. Akpokodje (2022) examined the impact of infrastructure spending on economic growth in Nigeria and found significant positive effects. The study estimated that a 10% increase in infrastructure expenditure led to a 2.5% increase in GDP growth over the long term. Ogunleye (2008) investigated the relationship between government expenditure and economic growth in Nigeria using time series data from 1970-2003. The study found that government expenditure had a positive but insignificant effect on economic growth, suggesting that expenditure efficiency might be more important than expenditure levels. Nwankwo and Njogo (2013) examined fiscal policy effects on economic growth in Nigeria from 1981-2010 and found no significant relationship between total government expenditure and growth. They attributed this to poor expenditure quality, corruption, and weak institutional capacity.

Furthermore, Oriavwote and Oyovwi (2018) investigated the determinants of economic growth in Nigeria with emphasis on fiscal policy variables. Using data covering 1970-2010, their ARDL results showed that government capital expenditure had a positive and significant effect on economic growth, while recurrent expenditure had a negative effect. They recommended prioritizing capital expenditure and improving expenditure efficiency. Akinlo and Lawal (2018) examined the impact of government expenditure on economic growth in Nigeria over the period 1986-2016 using the Vector Error Correction Model (VECM). The findings confirmed the existence of a long-run relationship between economic growth and government expenditure. Government expenditure had no significant impact on growth in the short run but showed positive effects in the long run. Yaqub (2018) investigated the effect of different components of government expenditure on economic growth in Nigeria. Using data from 1970-2016, the findings indicated that government expenditure on education and infrastructure had significant positive effects on economic growth, while expenditure on defense and administration showed negative effects. The researcher concluded that expenditure composition and efficiency are crucial for growth impact.

Theoretical Framework

Keynesian Theory and Economic Growth: Keynesian theory provides the foundational framework for understanding government expenditure effects on economic growth through aggregate demand mechanisms. Keynes (1936) argued that government spending stimulates economic activity through multiplier effects, particularly during periods of economic slack. The theory suggests that government expenditure increases aggregate demand, leading to higher output, employment, and income, which generates subsequent rounds of spending and economic growth. The effectiveness depends on economic context, existing capacity utilization, and expenditure efficiency (Ogundu, 2023).

Wagner's Law: Wagner's Law, formulated by German economist Adolph Wagner in 1883, suggests that as an economy develops the relative size of government expenditure increases. This law implies a positive correlation between economic development and government size, though it does not specify causality direction.

Endogenous Growth Theory: Modern endogenous growth theory, particularly the work of Romer (1986) and Lucas (1988), emphasizes the role of government expenditure in promoting long-term growth through human capital formation and technological progress. Government spending on

education, research and development, and infrastructure can generate positive externalities that enhance productivity and sustainable growth.

Research Gap

This study addresses three critical gaps in existing literature: temporal coverage extending through post-COVID fiscal policy changes; methodologically the use of ARDL Bounds testing for mixed-order integration; and comprehensive control variables including FDI and trade openness. The current research contributes by providing updated evidence on Nigeria's expenditure-growth nexus while accounting for alternative growth channels that previous studies often omitted.

Methodology

This study employs an ex-post-facto research design using secondary time series data with zero manipulation effects. The design follows a two-stage approach: first, determining statistical properties using Augmented Dickey-Fuller (ADF) unit root tests; second, model estimation using Autoregressive Distributed Lag (ARDL) methodology. The ARDL approach is justified because Nigerian macroeconomic data typically exhibits mixed-order integration, making traditional co-integration methods inappropriate.

The study is guided by Keynesian theory and endogenous growth theory, hypothesizing that government expenditure significantly affects economic growth through aggregate demand, infrastructure development, and human capital formation channels. The model specification follows established growth literature while incorporating Nigeria-specific considerations:

$$\mathbf{RGDP} = \mathbf{f}(\mathbf{GOVEXP}, \mathbf{FDI}, \mathbf{TOP}) \dots (3.1)$$

Where government expenditure (GOVEXP) is the primary variable of interest, while foreign direct investment (FDI) and trade openness (TOP) serve as control variables.

$$\text{In linear form: } \mathbf{RGDP}_t = \beta_0 + \beta_1 \mathbf{GOVEXP}_t + \beta_2 \mathbf{FDI}_t + \beta_3 \mathbf{TOP}_t + U_t \dots (3.2)$$

Transforming to natural logarithm to address heteroscedasticity:

$$\mathbf{LnRGDP}_t = \beta_0 + \beta_1 \mathbf{LnGOVEXP}_t + \beta_2 \mathbf{LnFDI}_t + \beta_3 \mathbf{LnTOP}_t + U_t \dots (3.3)$$

Where:

- **RGDP_t** = Real Gross Domestic Product (economic growth proxy)
- **GOVEXP_t** = Total Government Expenditure (primary variable of interest)
- **FDI_t** = Foreign Direct Investment (control variable for external capital)
- **TOP_t** = Trade Openness (control variable for international integration)
- **β₀, β₁, β₂, β₃** = Parameters to be estimated
- **U_t** = Error term

Sample Period Justification (1981-2024): The period captures Nigeria's major economic transitions: structural adjustment programs (1980s), democratic transition (1999), global financial crisis (2008-2009), oil price shocks (2014-2016), COVID-19 pandemic (2020-2021), and Post COVID-19 pandemic, providing comprehensive coverage of diverse fiscal policy contexts

The study utilized annual time series data covering the period 1981-2024, obtained from the Central Bank of Nigeria Statistical Bulletin, National Bureau of Statistics, and World Bank Development Indicators.

The study assumes linear relationships between variables, stationary error terms, and absence of significant structural breaks. Potential endogeneity between government expenditure and economic growth is acknowledged but not explicitly addressed due to instrument availability constraints. The

analysis does not distinguish between productive and unproductive expenditure components, which may mask differential effects

Results and Discussion

The analysis followed econometric procedures which tested for unit root in the data, co-integration and the model estimation using the ARDL approach. The unit root test uses the Augmented Dickey-Fuller (ADF) test statistic to compare with the chosen level of significance usually 5%. If the ADF test statistic is greater than the 5% critical value, we reject the null hypothesis of non-stationary and conclude that the data is stationary either at level, first or second difference of integration. The results are presented below:

Table 4.1: Summary of ADF Unit Root Test

Variables	ADF Test Statisti		Order of Integration	Decision Rule
	@ Level	@ First Difference		
RGDP	2.015461	-5.100545	I(1)	Stationary at First Difference
GOVEXP	1.508650	-5.563533	I(1)	Stationary at First Difference
FDI	0.878220	-5.082410	I(1)	Stationary at First Difference
TOP	-7.307589	-3.478148	I(0)	Stationary at Level

Critical value at 5% = -2.943427

Source: Extraction from the Eviews Result

Table 4.1 above shows a summary of the unit root test. The test shows that the variables have mixed order of integration; thus, we will adopt the long run properties of the variables using ARDL Bounds test approach as specified in Egbulonu (2018).

Long Run Estimates of the ARDL Model

The long run model gives the relationship between Real Gross Domestic Product (a proxy for Economic Growth) and Government Expenditure (GOVEXP), Foreign Direct Investment (FDI), and Trade Openness (TOP) over the long run period.

ARDL Bounds Test for Cointegration

The bounds test confirms long-run relationships among variables, validating the ARDL estimation approach for mixed-order integration data.

4.3 Long-Run ARDL Model Estimates

Table 4.2: Long-Run ARDL Coefficient Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Economic Interpretation
GOVEXP	11.774195	6.924803	1.700293	0.1129	Positive but insignificant effect
FDI	90.570934	7.271164	12.456181	0.0000	Strong positive significant effect
TOP	51.980482	7.055591	7.367276	0.0000	Moderate positive significant effect

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Economic Interpretation
C	1597.883204	204.094716	7.829126	0.0000	Significant intercept

Model Diagnostics:

- R-squared: 0.999267 (Adjusted: 0.998083)
- F-statistic: 843.8509 (Prob: 0.000000)
- Durbin-Watson: 2.361000

The long-run coefficients indicate that government expenditure has a positive but statistically insignificant effect on economic growth at the 5% significance level. In economic terms, a 1% increase in government expenditure is associated with a 11.77% increase in real GDP, but this relationship lacks statistical reliability.

Foreign Direct Investment (FDI) had a coefficient of 90.570934; this entails that it has a positive relationship with Economic Growth in Nigeria in the long run. This means that if Foreign Direct Investment increases by one unit, Economic Growth will increase by 90.570934 units. The significance test showed that Foreign Direct Investment has a significant effect on Nigeria's Economic Growth.

The coefficient of Trade Openness (TOP) is positive and estimated at 51.980482. This suggests that there is a positive relationship between Trade Openness and Economic Growth in Nigeria, entailing that an increment in TOP leads to a 51.980482 units' increment in Economic Growth. The significance test showed that Trade Openness has a significant relationship with Economic Growth in Nigeria.

Test of Hypotheses

Individual Test

The individual test was carried out with the use of t-statistics; the test is summarized below:

Table 4.3: Summary of Individual t-test Results

Variables	t-statistics	p-value	Decision Rule	Economic Significance
GOVEXP	1.700293	0.1129	<i>Accept Null Hypothesis</i>	Insignificant individual effect
FDI	12.456181	0.0000	<i>Reject Null Hypothesis</i>	Highly significant positive effect
TOP	7.367276	0.0000	<i>Reject Null Hypothesis</i>	Significant positive effect

Individual Hypothesis Interpretations:

Hypothesis 1: Government expenditure shows no statistically significant effect on economic growth (p-value = 0.1129 > 0.05), accepting the null hypothesis.

Hypothesis 2: Foreign direct investment demonstrates a highly significant positive effect on economic growth (p-value = 0.0000 < 0.05), rejecting the null hypothesis.

Hypothesis 3: Trade openness shows a significant positive relationship with economic growth (p-value = 0.0000 < 0.05), rejecting the null hypothesis.

Joint Significance Test: F-statistic = 843.8509 (p-value = 0.000000)

The joint test rejects the null hypothesis that all explanatory variables have no effect on economic growth, indicating significant collective influence despite government expenditure's individual insignificance.

Test of Goodness of Fit (R-square)

The coefficient of the Adjusted R-square revealed that about 99.80% of the changes in Real Gross Domestic Product of Nigeria were being accounted for by Government Expenditure (GOVEXP), Foreign Direct Investment (FDI), and Trade Openness (TOP). In other words, this shows that the explanatory variables could explain up to 99% of the total variations in the model which signifies a good fit for the model.

Test for Multi-collinearity

In testing for the presence of multi-collinearity in the model, variance inflation factor was used.

Decision for VIF: If $VIF > 10$, multi-collinearity is severe if the explanatory variables are more than 2; otherwise multi-collinearity is not severe.

Table 4.4: Variance Inflation Factor (VIF)

Variable	Coefficient	Variance Uncentered VIF	Centered VIF
GOVEXP	5.44617	5.3672	1.9797
FDI	7.30236	2.7349	8.8410
TOP	7.00201	8.31976	4.333801
C	15.5277	38.1088	

From the analysis above it reveals that the centered VIF of the explanatory variables are all less than 10. This showed that multicollinearity is not severe in the independent variables.

Discussion of Findings and Conclusion

The preliminary tests on the properties of the data showed that the variables used in the model have mixed order of integration. This prompted the test for long run relationship amongst the variables using ARDL Bounds test approach to co-integration, and the result showed that there is a long run relationship between the explanatory variables (GOVEXP, FDI, TOP) and Economic Growth in Nigeria.

In the long run, Government Expenditure (GOVEXP), Foreign Direct Investment (FDI), and Trade Openness (TOP) have positive coefficients which show positive relationships with Economic Growth. However, the P-value revealed that Foreign Direct Investment (FDI) and Trade Openness (TOP) are statistically significant while Government Expenditure (GOVEXP) is insignificant within the period of study. This contradicts the findings of Fajingbesi and Odusola (2018) in their study on fiscal policy and economic growth in Nigeria, which showed that government expenditure had a significant positive impact on economic growth.

The joint test proved that Government Expenditure (GOVEXP), Foreign Direct Investment (FDI), and Trade Openness (TOP) have a significant joint effect on Economic Growth in Nigeria. The finding upholds some theoretical postulations of Keynesian economics, with the view that government spending can stimulate aggregate demand and promote economic growth, though the individual effect suggests that efficiency and composition of spending may be more important than total levels. The test of goodness of fit showed that the explanatory variables could explain up to 99% of the total variations in the model which signifies a good fit for the model. Finally, the multicollinearity test showed that multicollinearity is not severe in the explanatory variables during the period of study.

Therefore, the study provides substantive empirical evidence to conclude that Government expenditure has not significantly increased the Economic Growth of Nigeria's economy during the period of study. The insignificant effect of government expenditure on economic growth may reflect several factors including poor project implementation, cost overruns, and bureaucratic inefficiencies may reduce the growth impact of government spending. Others might be the mix between productive (infrastructure, education, health) and unproductive (administration, defense) expenditures which may not favor growth-enhancing activities.

Study Limitations

Several limitations should be noted when interpreting these findings:

Aggregation Effects: The use of total government expenditure masks potential differential effects across expenditure categories (infrastructure, education, health, defense, administration).

Endogeneity Concerns: Potential reverse causality between government expenditure and economic growth is not explicitly addressed due to instrument availability constraints.

Data Quality: Reliability of Nigerian macroeconomic data, particularly government expenditure figures, may affect result accuracy.

Recommendations

Based on the findings of this study, the following recommendations were made:

- i. The National Planning Commission should develop robust project monitoring and evaluation systems to ensure timely and cost-effective implementation of government projects for effective and efficient result.
- ii. The government should prioritize productive expenditures (infrastructure, education, healthcare, technology) that have higher growth multiplier effects over administrative and non-productive spending.
- iii. Promotion agencies should continue to improve the investment climate through regulatory reforms, infrastructure development, and investor protection mechanisms

Future studies should consider:

1. **Disaggregated Analysis:** Examining differential effects of expenditure components (infrastructure, education, health, defense) on economic growth.
2. **Institutional Quality:** Incorporating governance and institutional quality variables to better understand expenditure effectiveness channels.
3. **Provincial Analysis:** Conducting state-level analysis to examine spatial variations in expenditure-growth relationships.
4. **Threshold Analysis:** Investigating optimal government expenditure thresholds for Nigeria's growth maximization.

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