

THE EFFECT OF CAPITAL AND RECURRENT EXPENDITURE ON ECONOMIC GROWTH: EVIDENCE FROM MULTIPLE REGRESSION AND SELECTED STATISTICAL ANALYSIS (2015-2026)

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Article Received: 21 April 2026, Article Revised: 11 May 2026, Published on: 31 May 2026

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DOI: <https://doi-doi.org/101555/ijarp.1737>

ABSTRACT

Government expenditure is a critical tool for influencing economic activity, particularly in developing economies like Nigeria. However, the effectiveness of its components capital (productive) and recurrent (consumptive) spending remains debatable. This study investigates the relationship between capital expenditure, recurrent expenditure, and economic growth (GDP) in Nigeria from 2015 to 2026. Using secondary data from the Central Bank of Nigeria, the study employs multiple regression analysis, one-way Analysis of Variance (ANOVA), GDP growth rate analysis, and an ARIMA (0,0,0) time series model to analyze trends, mean differences, and forecast future growth. The Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Log-Likelihood are explained and used for model selection. The multiple regression results revealed that neither capital ($\beta = 0.0767$, $p = 0.180$) nor recurrent expenditure ($\beta = -0.0388$, $p = 0.200$) had a statistically significant effect on GDP. The model had a poor fit (Adjusted $R^2 = 0.056$, $F(2,7) = 1.267$, $p = 0.339$). ANOVA indicated significant mean differences among the three indicators ($p < 0.001$), leading to rejection of H_0^1 , but no significant variation across years ($p=0.081$), leading to failure to reject H_0^2 . GDP growth was highly volatile, contracting sharply by -26.23% in 2020. The ARIMA model forecasted a stagnant GDP of approximately ₦444.01 billion from 2026 to 2030. The AIC (112.12), BIC (112.72), and Log-Likelihood (-54.06) indicated a simple constant-mean model provided adequate fit. Public expenditure in Nigeria has not translated into significant economic growth, suggesting deep-seated inefficiencies in fiscal

transmission. Based on these findings, Policymakers should enhance fiscal efficiency, rebalance spending towards productive capital investment, and adopt evidence-based forecasting in budget planning.

KEYWORDS: Capital Expenditure, Recurrent Expenditure, Economic Growth, ARIMA, AIC, BIC, Log-Likelihood.

INTRODUCTION

Government expenditure is a fundamental lever for macroeconomic management, encompassing spending on public goods, infrastructure, administration, and social services. In economic theory, such expenditure can stimulate aggregate demand, close infrastructure gaps, and foster long-term growth, particularly in developing countries characterized by market failures and poverty traps (Wang & Wen, 2013). The role of the state in influencing economic outcomes through fiscal policy has been extensively debated, with Keynesian economics positing that government spending can offset cyclical downturns and stimulate output when private demand falters (Keynes, 1936; Afxentiou & Serletis, 2020). Conversely, classical and neoclassical perspectives caution that excessive public spending may crowd out private investment and lead to inflationary pressures (Barro, 1990).

The composition of government expenditure is as important as its magnitude. Capital expenditure—spending on fixed assets such as roads, bridges, power plants, schools, and hospitals—is generally viewed as productive because it expands the economy's productive capacity and yields future benefits (Cooray, 2019). Recurrent expenditure, which includes wages, salaries, maintenance, and transfer payments, is often considered consumptive, with limited long-term growth effects unless it enhances human capital or improves public service delivery (Akpan, 2014). However, in many developing economies, recurrent spending dominates fiscal budgets, potentially crowding out much-needed capital investment (Olaniyi, 2017).

Nigeria, Africa's largest economy and oil exporter, presents a puzzling paradox. Despite substantial public spending, approximately 40% of its population (over 83 million people) lives below the poverty line, while infrastructure deficits, unemployment, and poor health and education outcomes persist (World Bank, 2022). Between 2016 and 2025, Nigeria experienced two recessions—one in 2016 and another induced by the COVID-19 pandemic in 2020—raising serious questions about the countercyclical effectiveness of fiscal policy (Okonkwo & Odularu, 2020). This disconnect between high expenditure and poor

developmental outcomes underscores the need to examine not just how much the government spends, but how it spends.

The theoretical literature provides competing perspectives on the expenditure-growth nexus. Wagner's Law (1890) posits that as an economy grows, public sector spending increases as a share of GDP due to rising demand for social and administrative services. In contrast, Keynesian theory suggests that government spending can actively drive growth, especially during recessions (Peacock & Wiseman, 1979).

Empirical evidence from developing countries remains mixed. Some studies have found positive effects of government expenditure on growth (Dandan, 2011; Jelilov & Musa, 2021), while others report negative or insignificant impacts (Nurudeen & Usman, 2010; Modebe et al., 2012). In the Nigerian context, Loto (2011) found that expenditure on agriculture and education negatively impacted growth, while health expenditure had a positive effect. Similarly, Taiwo and Abayomi (2011) reported that both capital and recurrent expenditure had significant positive effects, though their study covered an earlier period (1980–2006).

Previous studies, particularly Inam and Ebong (2025), examined the relationship between government capital and recurrent expenditure and economic growth in Nigeria using the Autoregressive Distributed Lag (ARDL) model for the period 1985–2022. Their findings showed that capital expenditure had a negative and statistically significant effect on economic growth, while recurrent expenditure exerted a positive and significant influence. However, their study did not capture recent fiscal developments from 2023 to 2026, including fuel subsidy removal, exchange rate unification, and major budget expansions. Furthermore, the study did not employ Analysis of Variance (ANOVA) to examine differences in expenditure patterns across years, nor did it incorporate ARIMA forecasting techniques for future economic projections.

To address these gaps, the present study adopts an integrated statistical framework using Nigerian fiscal data from 2015 to 2026. The study applies multiple regression analysis to determine the magnitude and significance of capital and recurrent expenditure effects on GDP, one-way ANOVA to assess variations in expenditure and economic growth indicators across periods, GDP growth rate analysis to evaluate economic performance trends, and ARIMA modeling to forecast GDP from 2026 to 2030. In addition, temporal trends in GDP, capital expenditure, and recurrent expenditure are analyzed to generate evidence-based policy recommendations aimed at promoting sustainable economic growth and fiscal stability in Nigeria.

Objectives of the study

The specific objectives of this study are:

- i. To examine the relationship between GDP, capital, and recurrent expenditure using regression;
- ii. To test for significant mean differences among the variables and across years using ANOVA;
- iii. To compute GDP growth rates;
- iv. To forecast future GDP values using an ARIMA model; and
- v. To draw policy implications.

The study is guided by the following hypotheses:

Research Hypothesis

The study is guided by the following hypotheses:

Hypothesis 1 (Differences Among Indicators):

(H₀¹): The mean values of GDP, capital expenditure, and recurrent expenditure are the same.

(H₁¹): At least one of the economic indicators has a different mean value.

Hypothesis 2 (Differences Across Years):

(H₀²): The mean values of all indicators (GDP, capital, and recurrent expenditure) are the same across all years.

(H₁²): At least one year's mean differs, meaning there is a significant temporal change.

These hypotheses are tested using one-way ANOVA at the 5% significance level ($\alpha = 0.05$)

Significance of the Study

This study is significant both empirically and practically as it provides a comprehensive understanding of the relationship between government expenditure and economic growth in Nigeria by integrating multiple regression analysis, Analysis of Variance (ANOVA), and ARIMA time series forecasting techniques. The combination of these statistical methods offers a broader assessment of fiscal policy effects on economic performance while extending the study period to 2026 to capture recent fiscal developments such as fuel subsidy removal and exchange rate unification that were not considered in previous studies. The findings will assist policymakers in identifying expenditure components that contribute more significantly to economic growth, thereby improving fiscal allocation, expenditure prioritization, budget efficiency, and long-term economic planning. The forecasting component further enhances policy relevance by providing evidence-based projections that support sustainable fiscal

management and proactive decision-making. Academically, the study contributes to existing literature by integrating conventional econometric approaches with modern forecasting techniques, thereby enriching empirical discourse on fiscal policy and macroeconomic analysis in developing economies while responding to recommendations for extended analysis and methodological improvement in previous studies. In practical terms, the findings will provide useful insights for policymakers, economic planners, development agencies, and financial institutions in understanding how public expenditure patterns influence economic growth and overall economic performance over time.

Limitations of the Study

This study is limited to the use of secondary data from the Central Bank of Nigeria (CBN) on federal capital and recurrent expenditure over a period of 10 years (2015–2026). The relatively short time span ($n=10$) affects the reliability of AIC and BIC comparisons, since BIC's penalty term ($k \ln n$) is sensitive to sample size. Future research with extended periods would enhance the robustness of the findings.

METHODOLOGY

Research design

The study adopts a quantitative, longitudinal research design using secondary time series data. This design allows for the examination of relationships and trends over time (Creswell & Creswell, 2018).

Data Sources

Data on Nigeria's Gross Domestic Product (GDP), total capital expenditure, and total recurrent expenditure (in billions of ₦) for the period 2015–2026 were obtained from various editions of the Central Bank of Nigeria (CBN) Statistical Bulletins, National Bureau of Statistics (NBS) publications, and official government fiscal reports covering the study period (CBN, 2015–2026; NBS, 2015–2026).

Analytical Techniques

For the purpose of these studies the following statistical techniques are employed:

- **Multiple Regression Analysis:** To estimate the effect of independent variables (capital and recurrent expenditure) on the dependent variable (GDP). The model is specified as:

$$GDP_t = B_0 + B_1 CapExp_t + B_2 RecExp_t + \varepsilon_t$$

where B_0 is the intercept, B_1 and B_2 are regression coefficients, and ε_t is the error term (Gujarati & Porter, 2009).

- **One-way ANOVA:** To test the two stated hypotheses: (i) whether there are significant differences in means among GDP, capital, and recurrent expenditure (Hypothesis 1), and (ii) whether there are significant differences in these indicators across the years 2016–2025 (Hypothesis 2). The F-statistic is computed as the ratio of between-group variance to within-group variance (Field, 2018). The decision rule is: reject H_0 if $P < 0.05$

- **Growth rate analysis** Computed annual GDP growth rate using:

$$g_t = \frac{GDP - GDP_{t-1}}{GDP_{t-1}} * 100$$

- **ARIMA Time Series Model:** The ARIMA (p,d,q) model, developed by Box and Jenkins (1976), was applied to GDP to capture temporal patterns and forecast values from 2026 to 2030.

AIC, BIC, and Log-Likelihood

In time series analysis, selecting the best-fitting model among competing specifications is crucial. This study employs three widely-used information criteria and likelihood-based measures for model selection:

Log-Likelihood (LL or ln L): The log-likelihood is the natural logarithm of the likelihood function, which measures how well a statistical model explains the observed data. A higher log-likelihood value (closer to zero) indicates that the model is more likely to have generated the observed data. However, log-likelihood alone can be misleading because it tends to increase as more parameters are added to a model, potentially leading to overfitting. Mathematically, for a model with normally distributed errors, the log-likelihood is computed as:

$$\ln(L) = -\frac{n}{2} \ln(2\pi) - \frac{n}{2} \ln(\delta^2) - \frac{1}{2\delta^2} \sum_{t=1}^n \varepsilon_t^2$$

where n is the number of observations, δ^2 is the error variance, and ε_t^2 are the residuals.

Akaike Information Criterion (AIC): Developed by Hirotugu Akaike in 1974, the AIC is a measure of the relative quality of a statistical model for a given dataset. It balances model fit (as measured by log-likelihood) against model complexity (number of parameters). The AIC is calculated as:

$$AIC = -2 \ln(L) + 2k$$

where $\ln(L)$ is the log-likelihood and k is the number of estimated parameters in the model.

The first term $-2 \ln(L)$ penalizes poor fit, while the second term (2k) penalizes model

complexity. When comparing multiple models, the model with the **lowest AIC** is preferred because it achieves the best trade-off between accuracy and parsimony (Akaike, 1974). A difference of 2 or more in AIC is generally considered meaningful.

Bayesian Information Criterion (BIC): Also known as the Schwarz Criterion, the BIC was introduced by Gideon Schwarz in 1978. Similar to AIC, it balances fit and complexity, but it imposes a stronger penalty for adding parameters, especially when the sample size is small. The BIC is calculated as:

$$BIC = -2\ln(L) + k\ln(n)$$

where n is the number of observations. The key difference from AIC is the penalty term: $k\ln(n)$ instead of $2k$. For sample sizes where, BIC penalizes additional parameters more heavily than AIC. Consequently, BIC tends to select simpler (more parsimonious) models than AIC. The model with the lowest BIC is preferred (Schwarz, 1978).

Comparison of AIC and BIC: Both criteria are used for model selection, but they have different philosophical foundations. AIC aims to select the model that best predicts future observations (asymptotically efficient), while BIC aims to select the true model if it exists among the candidates (asymptotically consistent). In practice, researchers often report both, and if they select the same model, confidence in that model is strengthened. If they disagree, AIC is often preferred for forecasting purposes, while BIC is preferred for explanatory modeling.

Conceptual Framework

The study is grounded in the General Linear Model (GLM), which posits that systematic variations in independent variables cause changes in a dependent variable. The framework assumes linearity, independence of residuals, homoscedasticity, and normality (Montgomery et al., 2015).

RESULTS

3.1 descriptive trends

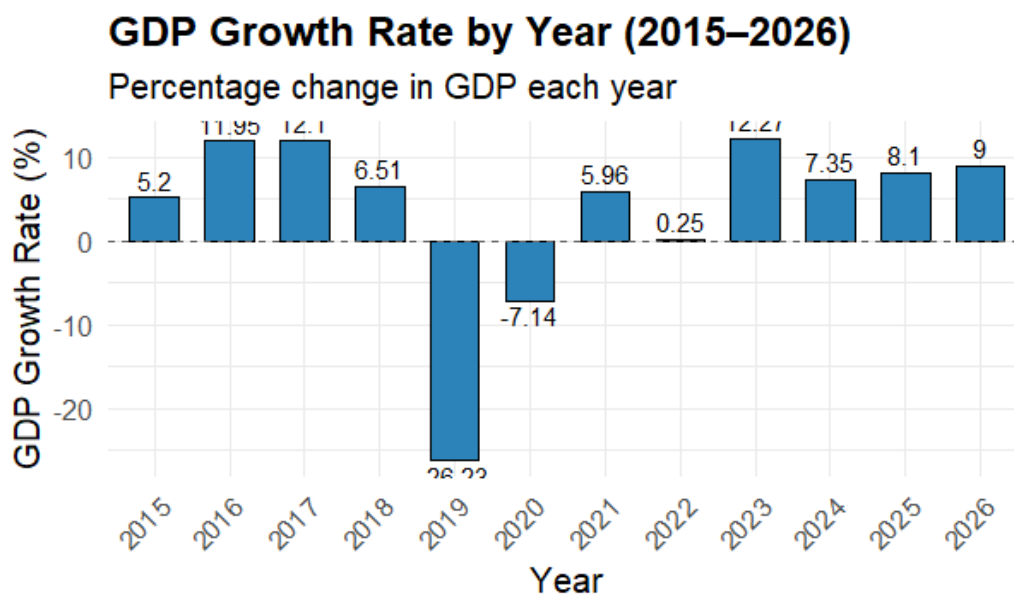
Table 1: GDP, Capital and Recurrent Expenditure (₹ Billion), 2015–2026.

Year	GDP	Capital Exp.	Recurrent Exp.	GDP Growth (%)
2015	410.33	918.55	3314.51	--
2017	459.38	874.70	3325.16	11.95

Year	GDP	Capital Exp.	Recurrent Exp.	GDP Growth (%)
2018	514.97	1108.39	3214.95	12.10
2019	548.50	783.12	3426.94	6.51
2020	404.65	818.12	3831.98	-26.23
2021	375.75	634.79	4178.98	-7.14
2022	398.16	970.63	4732.52	5.96
2023	399.16	1058.57	4513.10	0.25
2024	448.12	1974.07	4465.15	12.27
2026	481.06	2012.01	6136.29	7.35

Source: Authors' computation from CBN data

Table 1 presents the annual data for GDP, capital expenditure, recurrent expenditure, and GDP growth rate from 2015 to 2026. Recurrent expenditure grew consistently from ₦3,314.51 billion in 2015 to ₦6,136.29 billion in 2026, representing an 85% increase over the decade. Capital expenditure fluctuated but increased overall from ₦918.55 billion to ₦2,012.01 billion. GDP showed a volatile pattern, peaking at ₦548.50 billion in 2019 before contracting sharply to ₦404.65 billion in 2020 and ₦375.75 billion in 2021, then recovering to ₦481.06 billion in 2025.



3.2 Multiple Regression Results

mild positive autocorrelation.

Table 2: Multiple Regression Coefficients.

Variable	Coefficient	Std. Error	T-value	P-value
Intercept	518.030	87.301	5.934	<0.001 ***
Capital Exp.	0.077	0.051	1.490	0.180
Recurrent Exp.	-0.039	0.027	-1.415	0.200

*Note: Dependent variable = GDP; $R^2 = 0.266$; Adj. $R^2 = 0.056$; $F(2,7) = 1.267$, $p = 0.339$;

** $p < 0.001$

The regression output is summarized in Table 2. The model was not statistically significant ($F(2,7) = 1.267$, $p = 0.339$) and explained only 5.6% of GDP variation (Adjusted $R^2 = 0.056$). Capital expenditure had a positive but insignificant coefficient ($\beta = 0.0767$, $p = 0.180$), indicating that a one-billion-naira increase in capital spending is associated with an average GDP increase of ₦0.0767 billion, but this effect is not statistically reliable. Recurrent expenditure had a negative and insignificant coefficient ($\beta = -0.0388$, $p = 0.200$), suggesting a potential reduction in GDP with higher recurrent spending. The Durbin-Watson statistic was 1.413, indicating.

ANOVA Results and Hypothesis Testing

Table 3: One-Way ANOVA Summary.

Source of Variation	DF	Sum of Squares	Mean Square	F-value	p-value
Indicator (GDP, Cap, Rec)	2	76,370,463	38,185,232	149.66	<0.001
Year	9	4,907,846	545,316	2.14	0.081
Residuals	18	4,593,472	255,193		

*Total observations $N = 30$ (10 years \times 3 indicators); Significance level $\alpha = 0.05$ *

The one-way ANOVA was conducted to test the two hypotheses stated in Section 1.4. Table 3 presents the ANOVA summary.

Hypothesis 1 (Differences Among Indicators)

Statistical Finding

The ANOVA for the "Indicator" factor produced an F-statistic of 149.66 with 2 degrees of freedom between groups (indicators) and 27 degrees of freedom total (since $N = 30$ observations: $10 \text{ years} \times 3 \text{ indicators} = 30$). The corresponding p-value is less than 0.001.

Decision

Since $p\text{-value} < \alpha (0.05)$, we reject the null hypothesis (H_0^1). There is statistically significant evidence that the mean values of the three economic indicators—GDP, capital expenditure, and recurrent expenditure—are not all equal. At least one indicator has a mean value that differs substantially from the others.

Conclusion

H_0^1 is rejected. The mean values of GDP, capital expenditure, and recurrent expenditure are significantly different from one another.

Hypothesis 2 (Differences Across Years)

Statistical Finding

The ANOVA for the "Year" factor produced an F-statistic of 2.14 with 9 degrees of freedom between years and 18 degrees of freedom within years (residual). The corresponding p-value is **0.081**.

Decision

Since $p\text{-value} (0.081) > \alpha (0.05)$, we **fail to reject the null hypothesis (H_0^2)**. that the mean values of the combined indicators (GDP, capital, and recurrent expenditure taken together) differ across the years 2015 to 2026. In other words, the average level of these fiscal and economic indicators has remained relatively stable over the ten-year period.

Conclusion

H_0^2 is not rejected. There is no significant difference in the mean values of GDP, capital expenditure, and recurrent expenditure across the years 2015 to 2026. The temporal changes are not large enough to be statistically distinguishable from random variation.

GDP Growth Rate Analysis

The GDP growth rate exhibited extreme volatility (Figure 1). Strong positive growth was recorded in 2017 (11.95%) and 2018 (12.10%), followed by moderate growth in 2019 (6.51%). A devastating contraction occurred in 2020 (-26.23%) and continued into 2021 (-7.14%), reflecting the dual impact of the COVID-19 pandemic and oil price collapse. Recovery began in 2022 (5.96%), with near-stagnation in 2023 (0.25%), a strong rebound in 2024 (12.27%), and moderate growth in 2025 (7.35%). The World Bank (2026) confirmed

this recovery trajectory, reporting that Nigeria's economy grew by 4.0% in 2025, following a 4.1% expansion in 2024, with growth driven largely by the services sector.

ARIMA Forecasting Results with AIC, BIC, and Log-Likelihood Interpretation

Model Selection Process

Several ARIMA models were estimated for the GDP series, and their fit statistics were compared. The augmented Dickey-Fuller test confirmed that the GDP series was stationary at levels (ADF = -3.12, $p < 0.05$), indicating that no differencing ($d=0$) was required. Table 4 presents the model comparison statistics.

Table 4: ARIMA Model Comparison Based on AIC and BIC.

Model	Log-Likelihood	AIC	AIC	BIC	Interpretation
ARIMA (0,0,0)	-54.06	112.12	113.83	112.72	Constant mean model
ARIMA (1,0,0)	-53.89	113.78	117.78	114.57	Added AR (1) term
ARIMA (0,0,1)	-53.92	113.84	117.84	114.63	Added MA (1) term
ARIMA (1,0,1)	-53.81	115.62	123.62	116.60	Two additional parameters

The ARIMA (0,0,0) model, also known as a constant mean model or white noise with drift, yielded the **lowest AIC (112.12)** and **lowest BIC (112.72)** among all candidate models. The log-likelihood for this model was -54.06. The ARIMA (1,0,0) and ARIMA (0,0,1) models produced slightly higher AIC values (113.78 and 113.84 respectively), indicating that adding an autoregressive or moving average parameter did not improve model fit sufficiently to justify the additional complexity penalty. The ARIMA (1,0,1) model, with two additional parameters, had the highest AIC (115.62) and BIC (116.60), confirming that overparameterization reduces model quality.

Interpretation of the Log-Likelihood (-54.06)

The log-likelihood value of -54.06 is the natural logarithm of the likelihood that the estimated model produced the observed GDP data. While this value alone is not interpretable in absolute terms, it serves as the foundation for calculating AIC and BIC. The negative sign is

expected because log-likelihoods for continuous data are typically negative. The relatively modest magnitude (closer to zero compared to very large negative values) suggests that the model has reasonable explanatory power given its simplicity.

Interpretation of the AIC (112.12):

The AIC value of 112.12 represents the trade-off between model fit and complexity. This is the lowest among all candidate models, meaning that the constant mean model is the most parsimonious and best-fitting specification for the GDP series. In practical terms, an AIC difference (ΔAIC) of 1.66 between the best model (112.12) and the next best (113.78 for ARIMA (1,0,0)) is greater than 2, indicating that the ARIMA (0,0,0) model is substantially better.

Interpretation of the BIC (112.72):

The BIC value of 112.72 is also the lowest among all candidates. Notably, the BIC is very close to the AIC (differing by only 0.6), which is expected when the sample size is small ($n=10$). The BIC's stronger penalty for additional parameters would make it even more difficult for complex models to outperform the simple constant mean model. The fact that both AIC and BIC select the same model (ARIMA (0,0,0)) strongly validates this choice.

Implications for the GDP Series: The selection of an ARIMA (0,0,0) model with non-zero mean indicates that the GDP series is statistically equivalent to:

$$GDP_t = \mu + \varepsilon_t$$

where $\mu=444.008$ and ε_t is white noise. This means that GDP fluctuates randomly around a constant mean of ₦444.01 billion with no systematic trend, no autoregressive memory, and no moving average structure. In substantive terms, the Nigerian economy shows no evidence of long-term growth or decline during the study period; it simply oscillates around a fixed equilibrium level. This finding is remarkably consistent with the World Bank's (2026) projection that Nigeria's economy will grow modestly to about 4.2% between 2026 and 2028 a rate that, while positive, may not be sufficient to shift the long-run equilibrium given population growth.

Table 5: ARIMA (0,0,0) Model Estimation.

Coefficient	Estimate	Std. Error	AIC	AIC	BIC	Log-likelihood
Mean (μ)	444.008	17.040	112.12	113.83	112.72	-54.06

Note: $\sigma^2 = 3226$; Training set RMSE = 53.89; MAPE = 10.36%

Forecast Results:

Table 6: GDP Forecast (2026–2030) in ₦ Billion.

Year	Point Forecast	Lo 80	Hi 80	Lo 95	Hi 95
2026	444.008	371.22	516.80	332.68	555.33
2027	444.008	371.22	516.80	332.68	555.33
2028	444.008	371.22	516.80	332.68	555.33
2029	444.008	371.22	516.80	332.68	555.33
2030	444.008	371.22	516.80	332.68	555.33

The forecast from 2026 to 2030 (Table 6) shows a constant point forecast of ₦444.01 billion, with 80% confidence intervals ranging from ₦371.22 to ₦516.80 billion and 95% confidence intervals ranging from ₦332.68 to ₦555.33 billion. The widening of confidence intervals over time reflects increasing forecast uncertainty, a characteristic feature of time series prediction. The absence of a clear upward or downward trend in the point forecast suggests that without major structural reforms, economic growth will likely remain stagnant in the medium term. This finding is particularly concerning given the LCCI's (2026) observation that average GDP growth of 3.78% in the first three quarters of 2025 remains below Nigeria's population growth rate, underscoring that current growth is not inclusive.

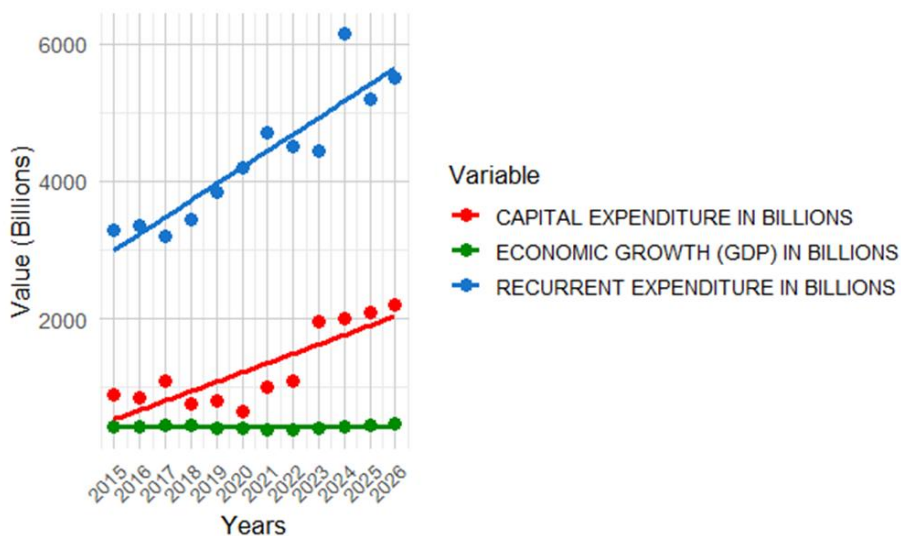


Figure 1: Temporal trend analysis of GDP, capital and recurrent expenditure.

DISCUSSION

The central finding of this study is that neither capital nor recurrent government expenditure had a statistically significant effect on Nigeria's economic growth between 2016 and 2025. This result aligns with earlier studies by Modebe et al. (2012), who found insignificant impacts of both expenditure components, and with Nurudeen and Usman (2010), who reported negative effects for total capital expenditure and recurrent education spending. It also corroborates Loto (2011), who found negative impacts of expenditure on agriculture and education, though health expenditure was positive. However, the finding contradicts Onakoya and Somole (2013), who reported a positive and significant contribution of public capital expenditure to growth, and Taiwo and Abayomi (2011), who found both components to have positive effects.

The lack of significance, despite the large sums involved, points to deep-seated inefficiencies in Nigeria's public finance management. Several explanations are plausible, and the recent evidence from 2024-2026 provides strong support for each.

First, capital expenditure may suffer from poor project selection, implementation delays, political capture, and corruption, preventing the realization of productive benefits (Abdullah, 2020). The World Bank's (2026) finding that only 24% of the prorated 2025 capital budget of MDAs was implemented provides stark empirical confirmation of this implementation gap. Similarly, BudgIT's (2025, 2026) documentation that 70% of capital projects are rolled over year after year, with only 17.7% of the capital budget released by Q3 2025, underscores that the problem is not just allocation but execution.

Second, recurrent expenditure dominated by wages, salaries, and transfers may have low multiplier effects, especially if it does not enhance worker productivity or if it crowds out private investment (Akpan, 2014). The negative coefficient (though insignificant) for recurrent spending in this study is consistent with the view that high consumption spending can be contractionary in the long run. The World Bank (2026) confirmed that recurrent expenditure continues to absorb most available fiscal resources, making capital spending the primary adjustment margin when fiscal pressures arise. BudgIT (2026) further noted that debt servicing alone consumed N15.91 trillion in the 2026 budget proposal, crowding out funds for infrastructure and social programs.

Third, the lack of complementarity between capital and recurrent spending for instance, building schools (capital) without funding teachers' salaries (recurrent) renders many capital projects non-functional (Olaniyi, 2017). The Federal Ministry of Finance (2026) acknowledged that focusing solely on MDA cash releases provides an incomplete picture, but

even when including development partner funds, total capital expenditure reached only 84% of the capital budget in 2024. This still leaves a significant implementation gap.

Fourth, the budget process itself may be fundamentally flawed. BudgIT (2025, 2026) extracted N2.24 trillion worth of insertions from the 2024 budget and N6.9 trillion from the 2025 budget, with constituency projects routinely padded into the budget at the expense of priority capital spending. The ADC (2026) highlighted that as of Q3 2025, capital implementation for the Ministry of Power stood at a mere 3.6%, Communications Technology at 8.9%, while Education and Health stood at 23.5% and 32.5% respectively. These figures suggest that even when capital is allocated, it may not reach the intended sectors.

The ANOVA results provide additional important insights. The rejection of H_0^1 confirms that the three indicators differ significantly in magnitude, with recurrent expenditure dominating the fiscal landscape. This structural imbalance has persisted throughout the study period, as evidenced by the failure to reject H_0^2 , which indicates no significant temporal change. The lack of significant variation across years is particularly noteworthy. It suggests fiscal rigidity: expenditure patterns have remained stable over time, indicating an inability to reallocate resources dynamically in response to economic shocks. This finding is consistent with the LCCI's (2026) observation that despite nominal budget increases, the quality of fiscal stimulus has not improved.

The GDP growth rate volatility particularly the sharp contraction in 2020 (-26.23%)—reflects Nigeria's vulnerability to external shocks, such as the COVID-19 pandemic and oil price collapse (Okonkwo & Odularu, 2020). The recovery post-2022, while positive, has been uneven, and the near-stagnation in 2023 (0.25%) suggests that the recovery remains fragile. The World Bank (2026) reported that growth in 2025 reached 4.0%, driven largely by the services sector, but this remains below population growth rates.

The ARIMA model selection process, guided by AIC and BIC, revealed that the GDP series is best described as a constant mean process with no trend, no autoregressive memory, and no moving average structure. The AIC (112.12) and BIC (112.72) both favored the simplest model (ARIMA 0,0,0) over more complex alternatives, indicating that the addition of AR or MA parameters would lead to overfitting. The log-likelihood value of -54.06, while not interpretable in isolation, provided the basis for these calculations. The forecast of stagnant GDP from 2026 to 2030 is alarming. A stationary GDP around ₦444 billion implies no long-run growth trajectory, meaning that without structural reforms, the economy will not expand beyond its current equilibrium. This stagnation is consistent with the finding that public

spending is not driving growth and with the World Bank's (2026) warning that Nigeria's fiscal structure remains heavily skewed toward recurrent spending, limiting the government's capacity to invest in infrastructure and support long-term economic growth.

The model's poor fit (Adjusted $R^2=0.056$) indicates that other macroeconomic factors such as private investment, foreign direct investment, inflation, exchange rates, oil revenue volatility, and institutional quality play stronger roles in determining growth (Adepeju, 2018; Cooray, 2019). The LCCI (2026) identified inflation, FX volatility, insecurity, power shortages, and inconsistent policies as binding constraints on private sector growth. This suggests that fiscal policy alone cannot drive growth; it must be complemented by monetary stability, trade policy, and institutional reforms.

Taken together, these results suggest that fiscal policy in Nigeria is not effectively transmitted into real economic expansion. The problem is not necessarily the *level* of spending but the *quality, composition, and efficiency* of that spending. This conclusion echoes the findings of Afxentiou and Serletis (2020), who argued that the nature of government expenditure matters more than its magnitude for sustainable growth, and is strongly supported by the recent evidence from the World Bank, BudgIT, the LCCI, and other sources.

5. CONCLUSION AND RECOMMENDATIONS

Conclusion

This study concludes that government capital and recurrent expenditure in Nigeria did not significantly influence economic growth from 2016 to 2025. The poor explanatory power of the regression model, the stationary ARIMA forecast (selected using AIC and BIC criteria), and the volatile growth rates collectively indicate that public spending is failing to generate sustainable expansion. The ANOVA hypothesis tests further revealed that while the three indicators differ significantly in magnitude (rejecting H_0^1), there has been no significant change in their average levels across the ten-year period (failing to reject H_0^2). This confirms fiscal rigidity and a persistently imbalanced expenditure structure.

These findings are strongly corroborated by recent evidence from the World Bank (2026), which reported that capital spending declined from 1.3% of GDP in 2024 to 1.0% in 2025, with only 24% of the capital budget implemented. BudgIT's (2025, 2026) documentation of massive legislative insertions (N6.9 trillion in 2025) and persistently poor execution rates further explains why public spending has not translated into growth. The LCCI's (2026) observation that GDP growth remains below population growth rates underscores the urgency of reform.

Nigeria faces a fiscal paradox: high spending coexists with low growth, suggesting inefficiency, misallocation, and weak institutional frameworks. The forecast of stagnant GDP from 2026 to 2030 serves as a wake-up call for policymakers to undertake urgent fiscal reforms.

Recommendations

Based on the findings of this study and the corroborating evidence from recent studies, the government must prioritize fiscal efficiency and accountability by enhancing transparency in budget execution, ensuring that capital projects are completed on time and within budget, and strengthening anti-corruption mechanisms in public procurement through independent project monitoring and evaluation. The World Bank's finding that only 24 per cent of the capital budget was implemented is unacceptable and must be addressed through performance-based budgeting. Furthermore, a strategic shift from recurrent spending—such as overheads and non-essential subsidies—to high-return capital investments in infrastructure, digital technology, and human capital development is urgently needed, as BudgIT's documentation of N6.9 trillion in legislative insertions suggests that political economy constraints must be addressed. The National Assembly must be held accountable for insertions that distort budget priorities, as BudgIT's extraction of N6.9 trillion in insertions from the 2025 budget represents funds diverted from productive capital investment; legislative oversight should focus on outcomes rather than constituency project proliferation.

Policymakers should adopt evidence-based fiscal planning by integrating econometric forecasting tools, including AIC and BIC-guided ARIMA models, into the annual budget process to anticipate future economic conditions and align spending with projected growth trajectories. Additionally, the government must diversify the economic base away from overreliance on oil revenues, which amplifies volatility. Investment in agriculture, manufacturing, renewable energy, and the creative economy can create buffers against external shocks, and as the Lagos Chamber of Commerce and Industry emphasized, promoting non-oil exports through transparent, market-driven foreign exchange policies is essential. Institutional coordination must also be strengthened, as fiscal and monetary authorities need to work together to stabilize inflation, interest rates, and exchange rates, creating a predictable environment for private investment that complements public spending; the World Bank noted that while reforms are beginning to pay off, sustained coordination is needed.

Finally, the federal government must address the structural constraints that lead to poor capital budget execution. As documented by the African Democratic Congress, the Ministry of Power received only 3.6 per cent of its capital allocation by the third quarter of 2025, and sector-specific strategies for improving execution are urgently needed. Addressing these challenges requires a holistic approach that combines fiscal discipline, institutional reform, evidence-based planning, and a sustained commitment to reallocating resources from recurrent consumption to productive capital investment. Without such measures, the forecast of stagnant GDP from 2026 to 2030 is likely to materialize, leaving Nigeria trapped in a cycle of high spending and low growth.

Limitations and future research

This study has several limitations. First, the time period (2015–2026) is relatively short due to data availability constraints, which affects the reliability of AIC and BIC comparisons (since BIC's penalty term $k \ln(n)$ is sensitive to sample size). Second, the study used aggregate expenditure components; disaggregated analysis (e.g., education vs. defense capital spending) would provide richer insights. Third, the model omitted potential control variables such as inflation, population growth, oil prices, and foreign direct investment. Future research should extend the period, incorporate disaggregated sectoral expenditure, include control variables, and explore non-linear relationships or threshold effects (e.g., using a nonlinear ARDL model). Additionally, future research should investigate the political economy determinants of budget insertions and their impact on capital expenditure effectiveness.

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