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Aggregate Government Spending and Economic Growth in Nigeria: Short-Run Dynamics and Long-Run Relationships

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Abstract
This study investigates the relationship between aggregate government spending and economic growth in Nigeria, with particular emphasis on both short-run dynamics and long-run relationships. Using annual time-series data from the Central Bank of Nigeria (CBN) Statistical Bulletin spanning the period 1981–2023. The analysis employs techniques like the unit root test, the Johansen cointegration test and the Vector Error Correction Model (VECM) to determine the existence of a long-run equilibrium relationship among the variables. Given the evidence of cointegration, the Vector Error Correction Model (VECM) is utilised to estimate both the short-run effects and the speed of adjustment toward long-run equilibrium and long-run relationships. The variables considered included Real Gross Domestic Product (RGDP) as a proxy for economic growth and aggregate expenditure, which combines recurrent and capital expenditures. The findings reveal a significant negative long-run effect of aggregate expenditure on economic growth, highlighting inefficiencies in public spending. However, short-run results indicate a temporary positive response to expenditure shocks. The variance decomposition shows a moderate contribution of aggregate expenditure to GDP growth. The findings challenged the Keynesian hypothesis in the long run and underscored the necessity for directing public spending towards productive sectors to achieve sustainable economic growth. These results align with existing empirical literature emphasising the importance of efficient and targeted government spending. The study concludes by recommending the enhancement of public spending efficiency and a focus on productive expenditures in critical sectors like infrastructure, education, and healthcare to foster sustainable economic growth.

Keywords: Aggregate government expenditure, Productive expenditure, Real Gross Domestic Product, Vector Error Correction Model (VECM), Error Correction Term (ECT)

Introduction

The relationship between public expenditure and economic growth has generated considerable debate among scholars, particularly regarding the direction of causality between the two variables. This controversy is rooted in two major theoretical perspectives. Wagner's Law views government expenditure as an endogenous variable that increases as economic growth expands, while the Keynesian hypothesis posits that government spending serves as an exogenous policy instrument capable of stimulating economic growth. In modern economies, government intervention through public expenditure performs essential functions such as allocation, stabilisation, distribution, and regulation, especially where market mechanisms prove inefficient or socially undesirable (Usman et al., 2011b). Public expenditure is therefore widely recognised as an important fiscal policy tool for achieving macroeconomic objectives, including economic growth, employment generation, price stability, poverty reduction, and overall development. Its effects are often expected to manifest in both the short run and the long run.

Since independence, Nigeria has consistently utilised public expenditure as a strategy for promoting economic growth and equitable resource distribution. Despite increasing government spending on infrastructure, education, healthcare, security, and administration, economic growth has remained relatively sluggish and failed to produce corresponding improvements in key macroeconomic indicators (Dikeogu et al., 2016; Okoro, 2013). This weak performance is reflected in persistent poverty, unemployment, infrastructural decay, widespread illiteracy, and poor health outcomes, including high infant and child mortality rates (Aluko & Aigbedion, 2018; Nwaolisa & Amakor, 2017; Udo et al., 2018).

Empirical studies in Nigeria have produced mixed findings. While some studies reported positive effects of government expenditure on economic growth, particularly through capital and infrastructure spending, others found insignificant or negative effects due to inefficiency, corruption, and poor resource allocation. Against this background, this study investigates the relationship between aggregate government spending and economic growth in Nigeria by examining both short-run and long-run dynamics using the Johansen cointegration test and the Vector Error Correction Model (VECM).

Despite substantial public spending in key sectors such as recurrent expenditure, capital projects, transportation, education, and healthcare, Nigeria has yet to achieve the desired level of economic growth. Sadly, Nigeria continued to rank among the poorest countries in the world despite rising government expenditure. This persistent challenge raises concerns about the effectiveness and transparency of public expenditure implementation. While existing studies have explored the relationship between public spending and economic growth, many have focused on long-run dynamics, with limited attention to short-run equilibrium effects. Given the potential for short-term fiscal policies to influence economic performance, a deeper understanding of these short-run interactions is crucial. This study addresses this gap by estimating the short-run and long-run relationships between aggregate public expenditure and economic growth in Nigeria from 1981 to 2022 by providing empirical insights to inform more effective fiscal policy decisions. Thus, the main objective of this study is to examine the impact of aggregate government spending on economic growth in Nigeria. The specific objectives are:

i. To examine the short-run relationship between aggregate government spending and economic growth in Nigeria.
ii. To investigate the long-run relationship between aggregate government spending and economic growth in Nigeria.

The study was guided by the following research questions:

i. What is the short-run relationship between aggregate government spending and economic growth in Nigeria?
ii. What long-run relationship exists between aggregate government spending and economic growth in Nigeria?

In line with the objective stated, the study seeks to test the following hypotheses:

H_{O1}. There is no significant short-run relationship between aggregate public expenditure and economic growth in Nigeria.

H_{O2}. There is no significant long-run relationship between aggregate government spending and economic growth in Nigeria.

Literature Review

Conceptual Clarifications

Public expenditure, also referred to as government expenditure or public spending, constitutes a major fiscal policy instrument used to achieve macroeconomic stability and economic growth. Both developed and developing countries utilise public expenditure to improve income distribution, direct resource allocation, and influence the composition of national income (Aluthge et al., 2021; N. E. Onuoha & Okoye, 2020). In Nigeria, public expenditure is broadly classified into recurrent and capital expenditure (Agu et al., 2015; Akpan, 2005; Modebe et al., 2012; Olaoye, C. O.; Oladipo, 2019). Recurrent expenditure refers to expenses incurred for the daily running of government, including salaries, wages, consumables, rents, and maintenance costs, whose benefits are largely limited to the year of expenditure (Abubakar, 2016; Haliru, 2023). Capital expenditure, on the other hand, relates to investment spending on projects such as roads, bridges, hospitals, schools, and other infrastructure with long-term developmental benefits.

Although conceptually distinct, recurrent and capital expenditures are closely interconnected. Capital projects often generate recurrent obligations through operational and maintenance costs, while recurrent expenditure remains embedded in the implementation of capital projects (Agbonkhese & Asekome, 2014). Similarly, the amount available for investment depends not only on revenue generation but also on the scale of recurrent commitments (Aigheyisi, 2013). Public expenditure may also be categorised into exhaustive expenditure, involving government purchases of goods and services, and transfer expenditure, which does not involve direct factor purchases (Egbetunde & Fasanya, 2014).

Public expenditure in Nigeria can further be disaggregated into expenditure on human capital development, infrastructure, administration, and transfers (Usman et al., 2011b; Gukat & Ogboru, 2017). Human capital expenditure includes spending on education and health, while infrastructure expenditure covers transport, communication, and power. Administrative expenditure encompasses defence, internal security, and governance, whereas transfer expenditure includes pensions, debt servicing, gratuities, and contingency transfers.

Underpinning Theories

Classical growth theorists advocated minimal government intervention in economic activities. Rooted in the laissez-faire doctrine, they argued that unrestricted market forces ensure efficient resource allocation and economic growth, while excessive government intervention distorts market efficiency (Bingilar & Oyadonghan, 2020; Keita, 2016; Nworji & Oluwalaiye, 2012). The neoclassical growth theory reinforced this argument toward fiscal intervention. According to Nyasha and Odhiambo (2019), public expenditure may hinder economic growth through the crowding-out effect, where government spending displaces private investment. The theory further assumes that fiscal policy exerts limited long-run influence on real output because economies naturally converge toward equilibrium (Piętak, 2014).

In contrast, endogenous growth theory emerged in the 1980s as a critique of the neoclassical framework. The theory emphasises that growth is driven by internal factors such as innovation, human capital, and knowledge accumulation. It assigns a central role to government policy, particularly productive public expenditure, in stimulating long-run economic growth (Alper & Demiral, 2016; Hrnjic & Brankovic, 2017; Sharipov, 2012).

Wagner's Law of Increasing State Activities argues that causality runs from economic growth to government expenditure. According to Wagner, industrialisation and economic expansion

naturally increase public spending due to rising administrative and social demands (Esener & İpek, 2018; Keho, 2017; Mishra & Mohanty, 2021; Odo et al., 2016; Olanrewaju & Funlayo, 2021; Olayiwola et al., 2021). Conversely, the Keynesian hypothesis posits that government expenditure drives economic growth. Keynes argued that fiscal policy is necessary to address unemployment and economic instability through increased aggregate demand, output, and employment generation (Esener & İpek, 2018; Idris & Bakar, 2017; Iftikar-ul-husnain, 2011; Pula & Elshani, 2017; Srinivasan, 2013).

The Peacock and Wiseman displacement theory further explains that public expenditure grows in discrete shifts, particularly during political, economic, or social disturbances, leading to permanent increases in government spending (Efobi & Osabuohien, 2012; Ejem et al., 2019). Building on this perspective, the study adopts the endogenous growth model developed by Barro (1990) and Barro & Xavier (1992) as its theoretical framework. Barro's model distinguishes between productive and unproductive government expenditure, arguing that only the productive expenditure, such as spending on education, health, and infrastructure, contributes positively to long-run economic growth. Unproductive expenditure, by contrast, may hinder growth. The model further highlights that fiscal policy, including both government spending and taxation, can exert both temporary and permanent effects on economic growth.
Overall, while classical and neoclassical theories caution against excessive government intervention, Keynesian and endogenous growth theories emphasise the growth-enhancing role of productive public expenditure. Consequently, Barro's endogenous growth framework provides a suitable basis for analysing the influence of government spending on economic growth in Nigeria.

Empirical Review

Empirical evidence on the relationship between government expenditure and economic growth reveals complex interactions involving both short-run dynamics and long-run equilibrium relationships. Many studies using cointegration techniques establish the existence of long-run relationships between public expenditure and economic growth. Studies such as Tamilselvan & Manjul (2019), Paul & Furahisha (2017), Mwamkonko (2021), and Mulugeta (2022) confirmed that government expenditure and economic growth are cointegrated. Nigerian studies including Usman et al. (2011a), Ejem et al. (2019), Matthew et al. (2019), Badiru et al. (2022), and Abomaye-Nimenibo & Samuel (2020) similarly found long-run equilibrium relationships between public spending and growth. These findings generally support the Keynesian proposition that government expenditure stimulates economic activity over time.
However, contradictory evidence exists. Popescu & Diaconu (2021) and Mushtaq et al. (2023) found no evidence of long-run cointegration, suggesting that the fiscal-growth nexus may depend on country-specific institutional and structural conditions. The literature also reveals mixed short-run effects of government expenditure on economic growth. Some studies found positive short-run impacts, while others reported insignificant or negative effects. For example, Okpabi et al. (2021) reported a negative but insignificant short-run effect despite a positive long-run relationship. Usman et al. (2011b) similarly found no significant short-run effect of public expenditure on growth. In contrast, Badiru et al. (2022) and Bounsaythip & Inthakason (2022) found positive short-run effects, suggesting that fiscal shocks may temporarily stimulate economic activities. These inconsistencies indicate that short-run dynamics are sensitive to policy implementation, macroeconomic conditions, and expenditure composition.

A major theme across the literature concerns the distinction between aggregate and disaggregated expenditure. Empirical and theoretical studies by Barro (1990) and Barro and Sala-i-Martin (1992) emphasise that productive expenditures on education, health, and

infrastructure positively influence long-run growth by enhancing productivity and human capital. Studies such as Bose et al. (2007), Mwamkonko (2021), and F. C. Onuoha & Agbede (2019) found that capital and infrastructure expenditures positively affect growth, whereas recurrent expenditures often produce insignificant or negative effects.

Nigerian evidence also reflects mixed outcomes. Ebipre & Eniekezimene (2020) reported that capital expenditure negatively affects growth due to inefficiencies, while recurrent expenditure positively influences growth. Similarly, Matthew et al. (2019) found that recurrent expenditure contributes positively to growth, whereas capital expenditure exerts a negative long-run effect. These contradictions suggest that the effectiveness of public spending depends largely on governance quality, expenditure efficiency, and institutional effectiveness. Methodological differences also contribute to variations in empirical findings. Studies employing Johansen cointegration and Vector Error Correction Models often emphasise long-run equilibrium relationships and adjustment dynamics, while studies using Autoregressive Distributed Lag (ARDL) techniques provide greater flexibility in handling mixed integration orders and smaller samples. For example, Aluthge et al. (2021) and Ekpo et al. (2022) found significant short-run and long-run effects of government expenditure on economic growth in Nigeria using ARDL models.

The literature further reveals divergent support for Keynesian theory and Wagner's Law. Studies such as Tamilselvan and Manjula (2019), Ekpo et al. (2022), and Okpabi et al. (2021) support the Keynesian view that government expenditure drives economic growth. Conversely, Nwude and Boloupremo (2018) and Iftikar-ul-husnain (2011) provide evidence supporting Wagner's Law, suggesting that economic growth leads to increased government expenditure. Some studies, including Popescu and Diaconu (2021), even reveal bidirectional causality between the variables. Despite extensive empirical studies, important gaps remain. Much of the literature either focuses mainly on aggregate expenditure or fails to integrate short-run and long-run dynamics within a unified framework. The persistence of mixed findings, particularly within Nigeria, suggests that the relationship between government expenditure and economic growth remains inconclusive and heavily influenced by structural inefficiencies and institutional weaknesses. Against this backdrop, the present study contributes to the literature by simultaneously examining the short-run dynamics and long-run relationships between aggregate government expenditure and economic growth in Nigeria using a unified econometric framework.

Methodology

This study was premised on an ex-post facto research design aimed at ascertaining the short-term influence of aggregate government spending on Nigeria's real gross domestic product (GDP) from 1981 to 2022. The study employed secondary data for its analysis. The time series data used in this study was sourced from the published Statistical Bulletins of the Central Bank of Nigeria (CBN) covering the period from 1981 to 2022. Time series tools of analysis were adopted using the EViews econometric package. This study used correlational analyses alongside unit root tests to analyse the nature of the relationships between the variables and ensure the data's suitability for further analysis. This combined approach provides a comprehensive understanding of both the interconnections and the statistical properties of the data. The econometric techniques specifically employed the Johansen Cointegration Test and the Vector Error Correction Model (VECM) to examine the short-run relationship between public expenditure and economic growth, represented by real GDP. The Johansen Cointegration Test is used to determine whether a long-run relationship exists

among the variables. If cointegration is confirmed, the VECM is applied to analyse both short-run dynamics.

The VECM helps determine the adjustment speed at which deviations from short-run equilibrium converge to the long-run equilibrium. Higher coefficient values indicate a faster rate of correction from short-run fluctuations to long-term stability (Kyissima et al., 2017). If cointegration is confirmed between variables, it indicates a long-run relationship. The VECM is then used to analyse the short-run dynamics of these cointegrated variables (Usman & Osagie, 2023). The general form of Johansen cointegration can be expressed as follows:

$$\Delta Y_t = \prod Y_{t-1} + \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + \cdots + \Gamma_{p-1} \Delta Y_{t(p-1)} + \varepsilon_t \quad \text{---------- (1)}$$

Where:
Y_t is s vector of n non-stationary time series variables.

Δ represents the first difference operator (making the variables stationary).
Π is an n × n matrix of cointegration parameters
Γ_i for i = 1,2, ... P – 1 are matrices of coefficients on the lagged differences
P is the lagged length of the VAR model.
ε_t is a vector of white noise error terms.
The VECM is specified as follows:

$$\Delta Y_t = \prod Y_{t-1} + \Gamma_1 \Delta Y_{t-1} + \cdots + \Gamma_{p-1} \Delta Y_{t-p+1} + \varepsilon_t - \alpha_1 \varepsilon_{t-1} - \cdots - \alpha_{q-1} \varepsilon_{t-q+1} + \beta_1 \Delta X_{1t} + \cdots + \beta_k \Delta X_{kt} + \cdots \text{----------} \quad (2)$$

$$\Delta lnRGDP_t = \sigma + \sum_{i=1}^{k-1} \beta_i \, \Delta lnRGDP_{t-i} + \sum_{j=1}^{k-1} \varphi_j \, \Delta lnAE_{t-i} + \lambda_1 ECT_{t-1} + \varepsilon_{it} \quad (3)$$

Where: RGDP = Real Gross Domestic Product
AE = Aggregate expenditure

Variables in the model

Table 1: Data Description

S/N	Variable	Description
1	RGDP (Real Gross Domestic Product)	Used as a proxy for economic growth
2	AE (Aggregate Expenditure)	Refers to capital and recurrent expenditures fused together

Annual data was used for real GDP and Aggregate expenditure
Source: Author's Computation

The null hypotheses are tested against critical values at a 5% significance level

Results

Descriptive Statistics
Tables 2A and 2B presents descriptive statistics of the variables of the study. The mean, median, standard deviation, Variance, minimum, maximum, Skewness and Kurtosis have been used to describe the data.

Table 2A: Descriptive Statistics on Gross Domestic Products

	RGDP
Mean	38589.74
Median	28701.91
Maximum	74639.47
Minimum	16048.31
Std. Dev.	20854.23
Skewness	0.527287
Kurtosis	1.639848
Jarque-Bera	5.183742
(Probability)	(0.074880)
Observations	42

Source: Author's Computation, E-views 9.0

2A presents the descriptive statistics of the variables used in the study. The results show that Real Gross Domestic Product (LNRGDP) recorded a mean value of ₦38,589.74, with a standard deviation of ₦20,854.23, a minimum value of ₦16,048.31, and a maximum value of ₦74,639.47. The positive skewness indicates a right-tailed distribution, while the positive kurtosis suggests heavier tails than a normal distribution. Furthermore, the Jarque-Bera normality test revealed low probability values (less than 0.05), indicating rejection of the null hypothesis of normal distribution.

Table 2B: Descriptive Statistics on Aggregate Government Expenditures

	AE
Mean	2767.979
Median	1018.100
Maximum	13988.71
Minimum	9.600000
Std. Dev.	3615.657
Skewness	1.504860
Kurtosis	4.540087
Jarque-Bera	20.00299
(Probability)	(0.000045)
Observations	42

Source: Author's Computation, E-views 9.0

Table 2B presents the descriptive statistics of aggregate expenditure (AE) for the study period. The results show that AE recorded a mean value of ₦2,767.979, with a standard deviation of ₦3,615.657, a minimum value of ₦9.600000, and a maximum value of ₦13,988.71. The positive skewness indicates a right-tailed distribution, while the positive kurtosis suggests heavier tails than a normal distribution. In addition, the Jarque-Bera normality test revealed low probability values (less than 0.05), indicating rejection of the null hypothesis of normal distribution.

Table 3 Unit Root Test of Stationarity

Variables	**ADF with trend**				
	Test Statistic		1st difference		
	At level	Critical Value		Critical Value	
RGDP	-2.254449	-3.536601	-3.583322	-3.526609	I(1)
AE	3.013268	-3.540328	-3.088984	-3.540328	I(1)

ADF represents the Augmented Dickey Fuller test for stationarity with trend at level and first difference.
Source: Author's computation using EViews 9.0

The result of the ADF unit root test presented in Table 3 indicates that all variables are non-stationary at level; hence, the hypothesis of a unit root could not be rejected. However, at first difference, the variables became stationary and were consequently integrated of order one, I(1). This suggests the possibility of a long-run relationship among the variables and justifies the use of the Johansen cointegration test. The unit root hypothesis was therefore rejected for Real Gross Domestic Product (RGDP) and Aggregate Expenditure (AE) at first difference.

Test of Hypothesis

H_{o1}: There is no significant short-run relationship between aggregate public expenditure and economic growth in Nigeria.

To test this hypothesis, the Johansen co-integration and vector error mechanism, impulse response function and variance decomposition approach were applied. The VECM was used to estimate the short-run equilibrium and long-run equilibrium of aggregate government expenditure and the economic growth in Nigeria.

Johansen Cointegration

Cointegration Test on the Short-run Equilibrium Relationship between Aggregate Government Expenditure and the Economic Growth of Nigeria

Table 4: Series: LNRGDP LNAEX

Unrestricted Cointegration Rank Test (Tra				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.233234	14.87465	18.39771	0.1453
At most 1 *	0.100838	4.251693	3.841466	0.0392
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.233234	10.62296	17.14769	0.3423
At most 1 *	0.100838	4.251693	3.841466	0.0392

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level.
Source: Author's computation using EViews 9.0

The result of the Johansen cointegration test indicates the presence of one cointegrating equation at the 0.05 level of significance, as confirmed by both the Trace and Max-Eigen statistics. This suggests that Real Gross Domestic Product (RGDP) and Aggregate Expenditure (AE) maintain an equilibrium relationship in both the short run and the long run. The long-run cointegrating vectors and coefficients were obtained by normalising the cointegrating vector on RGDP, as presented in Table 4.

Table 5: Johansen Normalised

1 Cointegrating Equation(s): Log likelihood 66.70447

Variable	**Coefficient**	**Standard Error**	**Z**	**P>/Z/**
Normalized cointegrating coefficients				
RGDP	1			
AE	7.882576	1.79697		
Adjustment coefficients				
D(RGDP)	-0.027366	0.03074	0.89004	0.03453
D(AE)	-0.026984	0.00884	3.05248	0.00289

Source: Author's computation using E-view 9.0

The normalisation of the cointegrating vector produced the long-run elasticities by normalising with respect to Real Gross Domestic Product (RGDP). The result shows that Aggregate Expenditure (AE) has a negative and statistically significant long-run impact on RGDP, with a long-run elasticity of 7.882576. This implies that a decline in aggregate government expenditure reduces economic growth in Nigeria. Furthermore, the Vector Error Correction Model (VECM) was employed to estimate both the short-run and long-run equilibrium relationships between RGDP and AE.

$$\Delta lnRGDP_t = \sigma + \sum_{i=1}^{k-1} \beta_i \, \Delta lnRGDP_{t-i} + \sum_{j=1}^{k-1} \varphi_j \, \Delta lnAE_{t-i} + \lambda_1 ECT_{t-1} + \ \varepsilon_{it}$$

The result of the VECM model estimation is presented in Table 6 for each group of variables.

Table 6: Vector Error Correction Estimates on Short-Run Equilibrium Relationship between Aggregate Government Expenditure and the Economic Growth of Nigeria

Error Correction:	**D(LNRGDP)**	**D(LNAGEX)**
CointEq1	-0.005876 (0.00521) [-1.12834]	-0.008248 (0.00148) [-5.55841]
D(RGDP(-1))	0.569639 (0.12808) [4.44756]	-0.027092 (0.03649) [-0.74243]
D(AE(-1))	-0.612070 (0.67053) [-0.91281]	-0.256071 (0.19104) [-1.34041]
C	843.9110 (331.767) [2.54369]	463.0101 (94.5226) [4.89841]
R-squared	0.385077	0.617147
Adj. R-squared	0.333834	0.585243
F-statistic	7.514653	19.34363

Source: Author's computation using E-view 9.0

The Vector Error Correction Model estimates revealed that Real Gross Domestic Product (RGDP-1) has a negative and statistically significant influence on itself at lag one in the short run. The past realisation of RGDP is associated with about a 0.54 increase in RGDP, implying that a unit change in RGDP leads to a 0.54 rise in real gross domestic product in Nigeria in the short run. Similarly, Aggregate Expenditure (AE-1) exhibited a negative and statistically significant effect on RGDP at lag one. The past realisation of aggregate expenditure is associated with about a -0.61 per cent decrease in RGDP, indicating that a unit change in aggregate expenditure leads to a -0.02 reduction in real gross domestic product in the short run.

Furthermore, the error correction coefficient was negative and statistically significant at the 5 per cent level, indicating short-run adjustment toward long-run equilibrium. The error correction term suggests that about -0.58 per cent of disequilibrium in real gross domestic

product is corrected annually, implying a relatively low speed of adjustment toward long-run equilibrium.

Result on the Long-run Equilibrium Relationship between Aggregate Government Expenditure and the Economic Growth of Nigeria

Test of Hypothesis

H_{o2}: There is no significant long-run relationship between aggregate government spending and economic growth in Nigeria.

Table 7 : Vector Error Correction Estimates on long-run equilibrium relationship between aggregate government expenditure and the economic growth of Nigeria

Cointegrating Eq:	**CointEq1**
RGDP(-1)	1.000000
AE(-1)	-26.30314 (3.53517) [-7.44042]
C	29076.19

Source: Author's computation using E-view 9.0

Table 7 shows the VECM estimates of long-run coefficients revealed that the aggregate expenditure (AE) in the long run has a negative and statistically significant impact on Real Gross Domestic Product (RGDP), on average, ceteris paribus. The long-run coefficient is -26.3 between aggregate expenditure on real gross domestic product proxy economic growth in Nigeria. A unit change in aggregate expenditure will lead to a -26.3% decrease in real gross domestic product serving as a proxy for economic growth in Nigeria in the long run. This suggests that aggregate expenditure in the long run has a negative causal effect on real gross domestic product in Nigeria.

Impulse Response Function and Variance Decomposition

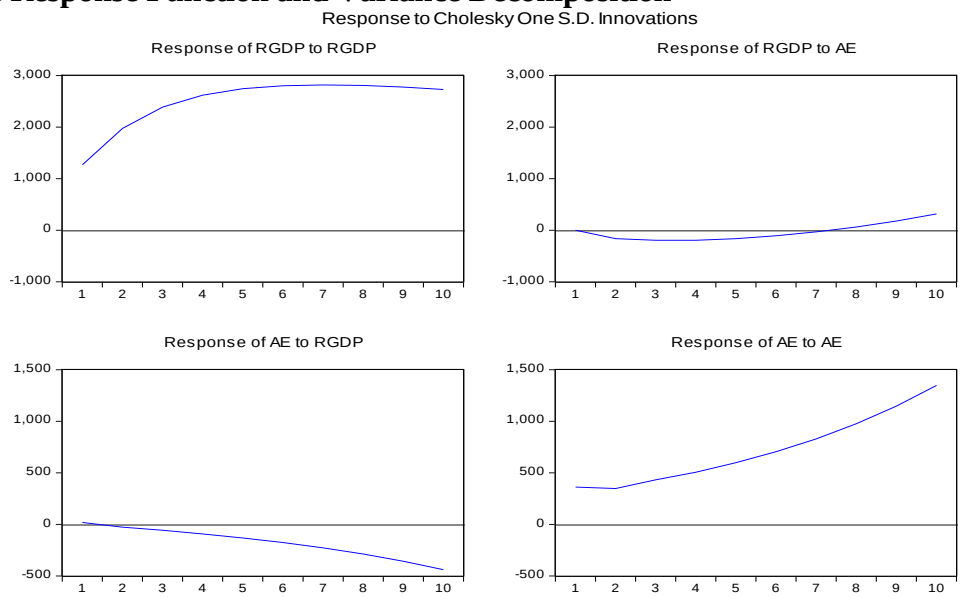

Figure 1: Impulse Response Function Between Real Gross Domestic Product and Aggregate Expenditure compiled by the authors.

The impulse response function (IRF) analysis quantifies the reaction of every variable in the model to an exogenous shock to the model. The reaction is measured for every variable at a certain time after shocking the system. The impulse response analysis is therefore a tool for inspecting the interrelation of the model variables.

Effect of Real Gross Domestic Product Shock: real gross domestic product response to shocks in the short run was positive and at the peak from the first period to the second period. The response declines from the third period throughout the tenth period but remains positive. As for aggregate expenditure response to shocks in real gross domestic product, the response was negative from the first period through to the tenth period.

Effect of aggregate expenditure Shock: aggregate expenditure response to shocks in the short run was positive and at its peak from the first period to the fourth period throughout the period. As for real gross domestic product response to shocks in aggregate expenditure, the response was positive from the first period and declined through to the fifth period and become negative through the tenth period.

Table 8: Variance Decomposition between Government Spending and Economic Growth

Variance Decomposition of LNRGDP

Period	**S.E.**	**RGDP**	**AE**
1	1267.359	100.0000	0.000000
4	4262.489	99.42476	0.575240
7	6443.429	99.65200	0.347995
10	8043.005	99.56897	0.431029
Variance Decomposition of AE			
Period	S.E.	RGDP	AE
1	361.0787	0.247163	99.75284
4	839.3422	1.846888	98.15311
7	1531.592	4.842383	95.15762
10	2613.173	7.588537	92.41146

Source: Author's computation using E-view 9.0

Table 8 shows the variance decomposition of Real Gross Domestic Product (RGDP) shocks in the 1-variable VECM model, and real gross domestic product shocks are treated as an exogenous variable. The estimates of the variance decomposition show that the aggregate expenditure (AE) has a moderate significant contribution to increases in real gross domestic product shocks, and this is consistent for the 10-time period chosen in this analysis for both the short run and the long run. Real Gross Domestic Product (RGDP) was a contributor to aggregate expenditure.

Impulse Response Function (IRF) Analysis

RGDP Response to AE Shocks: The positive short-run response of RGDP to AE shocks supports the Keynesian perspective, where government expenditure temporarily stimulates economic performance. However, the subsequent decline and eventual negative response in later periods reflect possible wastages in fiscal spending or unsustainable reliance on government expenditure.

Aggregate expenditure response to RGDP shocks suggested a positive and sustained response to RGDP shocks, indicating that economic growth might encourage increased fiscal outlays, potentially indicative of pro-cyclical fiscal behaviour.

Variance Decomposition

The results indicate that AE contributes marginally to variations in RGDP (less than 1% to 0.57% in the long run), underscoring its limited effectiveness in driving economic growth. Conversely, RGDP significantly contributes to AE variations, suggesting a growth-driven fiscal adjustment mechanism rather than an expenditure-driven growth model.

Discussion

The findings of this study provide important insights into the relationship between aggregate government spending and economic growth in Nigeria by revealing both short-run and long-run dynamics. The study established the existence of a positive short-run equilibrium relationship between aggregate public expenditure and economic growth, indicating that government spending exerts temporary stimulatory effects on economic activities. This finding aligns with the Keynesian proposition that fiscal expansion increases aggregate demand, output, and employment, especially during periods of economic instability. The result corroborates the findings of Ertekin and Bulut, Popescu and Diaconu, and Bounsaythip and Inthakason, who reported positive short-run effects of government spending on economic growth. Similarly, studies by Paul and Furahisha in Tanzania and Tamilselvan and Manjula in Oman confirmed significant relationships between public expenditure and economic performance.

Within the Nigerian context, the findings partially support the studies of Ekpo et al. and Badiru et al., which found that government expenditure stimulates economic growth in the short run. These studies argued that fiscal expenditure can serve as a stabilising mechanism capable of stimulating production and economic recovery. However, the findings contradict Jeff-Anyeneh et al. and Usman et al., who reported no significant short-run effect of government expenditure on growth. These inconsistencies may result from differences in methodology, periods of analysis, model specification, and the structure of expenditure examined. While some studies focused on disaggregated expenditure components, the present study concentrated on aggregate government spending, which may conceal variations among expenditure categories.

The study further reveals that the effect of government expenditure differs across expenditure categories. Existing literature suggests that productive expenditures on infrastructure, education, healthcare, and capital investment exert stronger positive effects on economic growth than recurrent or consumption expenditure. This position is supported by Barro and Barro and Sala-i-Martin, who argued that only productive government expenditure contributes positively to long-run growth through improved productivity and reduced production costs. Empirical findings by Mwamkonko showed that expenditure on human and physical capital positively affects growth, while consumption expenditure negatively influences economic performance. Similarly, Mulugeta found that expenditure on education stimulates growth, whereas expenditure in some sectors produces adverse effects. These findings imply that the effectiveness of government spending depends more on expenditure composition and efficiency than on aggregate expenditure size.

Evidence from Nigeria equally presents mixed outcomes. Matthew et al. found that recurrent expenditure positively influences growth, whereas capital expenditure exerts negative long-run effects. Likewise, Ebipre and Eniekezimene reported that recurrent expenditure positively affects growth while capital expenditure negatively impacts economic performance due to corruption, inefficiency, and project abandonment. In contrast, Kolawole and Aluthge et al. maintained that capital expenditure positively contributes to growth when efficiently

implemented. These conflicting findings suggest that Nigeria's challenge lies less in the volume of expenditure and more in weak institutions, corruption, poor implementation, and leakages associated with public spending.

The study further established that although government expenditure may stimulate economic activities in the short run, its long-run effect on economic growth is negative and statistically significant. This finding contradicts the Keynesian hypothesis, which assumes that increased government spending promotes long-run growth through aggregate demand expansion. Instead, the result aligns more closely with the neoclassical crowding-out argument, which suggests that excessive government expenditure can distort resource allocation, reduce efficiency, and crowd out private investment.

The long-run negative relationship also contrasts with several international studies. Tamilselvan and Manjula found a positive long-run relationship between government expenditure and economic growth, while Paul and Furahisha reported a positive long-run equilibrium relationship consistent with Wagner's Law. However, the Nigerian experience appears different due to structural inefficiencies, governance problems, and the dominance of recurrent expenditure over productive capital investment.

The findings strongly support the endogenous growth framework advanced by Barro, which argues that only productive expenditure contributes positively to long-run economic growth. The negative long-run effect identified in this study suggests that a substantial portion of Nigeria's expenditure is directed toward unproductive activities such as excessive administrative costs, debt servicing, political patronage, and inefficient recurrent spending. This interpretation is reinforced by Mwamkonko, who found that consumption expenditure negatively affects growth, and by Onuoha and Agbede, who observed that infrastructure spending promotes growth while education and health expenditures remain weak due to implementation challenges.

The findings also align with Nigerian studies emphasising inefficiencies in public expenditure management. Ejem et al. found that administrative expenditure negatively affects growth despite some positive effects from recurrent expenditure. Similarly, Okpabi et al. reported unstable fiscal policy outcomes characterised by negative short-run effects alongside positive long-run relationships. The present study therefore extends existing literature by showing that aggregate public expenditure, when inefficiently managed, may undermine long-run growth despite generating temporary short-run benefits.

Methodological differences also explain variations in empirical findings. Studies using Autoregressive Distributed Lag (ARDL) models, such as Aluthge et al. and Ekpo et al., often report more positive growth effects due to the flexibility of ARDL techniques in handling mixed integration orders and smaller samples. In contrast, the Johansen cointegration and vector error correction approaches adopted in this study emphasise long-run equilibrium relationships and adjustment dynamics, thereby exposing structural weaknesses embedded within Nigeria's fiscal system.

Conclusion

In conclusion, this study contributes to the literature on public expenditure and economic growth in Nigeria by examining both short-run and long-run dynamics. The findings support Keynesian short-run economic stimulation but reveal a negative long-run effect of government expenditure, thereby reinforcing the endogenous growth theory. The study highlights the need for disaggregated analysis of expenditure components and emphasises

that efficient allocation, transparency, accountability, and fiscal sustainability are essential for achieving sustainable economic growth in Nigeria.

Limitations

The study focused on public expenditure as the determinant of economic growth in Nigeria. The study is limited by the exclusion of other macroeconomic variables like inflation, exchange rate, investment, and labour force. Since economic growth is influenced by multiple factors, restricting the analysis to aggregate government spending and economic growth may not fully capture the broader macroeconomic environment.

Recommendations

i. Government should prioritise productive public expenditure by allocating more resources to infrastructure, education, healthcare, agriculture, technology, and other growth-enhancing sectors capable of promoting sustainable long-run economic growth in Nigeria.
ii. Policymakers should reduce excessive recurrent expenditure and redirect spending toward capital and developmental projects with stronger multiplier effects on productivity, employment generation, and economic expansion.
iii. The government should strengthen transparency, accountability, and fiscal discipline in public expenditure management to minimise corruption, leakages, project abandonment, and wasteful spending.
iv. Fiscal policy measures should focus not only on increasing the volume of government expenditure but also on improving the quality and efficiency of spending to enhance long-run economic growth.
v. Public projects should be subjected to effective monitoring, evaluation, and implementation mechanisms to ensure timely completion, efficient utilisation of funds, and measurable economic outcomes.
vi. Economic policymakers should design fiscal interventions that balance short-run economic stimulation with long-run sustainability to prevent temporary expenditure increases from creating long-term fiscal inefficiencies.

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