EDUCATION FINANCING AND ECONOMIC DEVELOPMENT: EVIDENCE FROM DISAGGREGATED GOVERNMENT SPENDING IN NIGERIA

SAMSON ADEGBOYEGA OPADEJI
Faculty of Arts Social and Management Sciences, Dominion University Ibadan
s.opadeji@dominionuniversity.edu.ng
MUMEEN OLATUNBOSUN ALABI
Economic Unit Osun State University, Osogbo, Nigeria
BAMIDELE SULAIMAN OLUGBON
Economic Unit Osun State University, Osogbo, Nigeria

Abstract

This study examines the impact of disaggregated educational expenditure on economic growth in Nigeria from 1981 to 2023. Specifically, it investigates the effects of capital and recurrent expenditures at the primary, secondary, and tertiary education levels on real gross domestic product (GDP). The study is anchored on the theoretical framework of Wagner and employed the Vector Error Correction Model (VECM) to explore both the short-run dynamics and long-run equilibrium relationships among the variables. This study contributes to empirical literature by disaggregating education spending across different levels and types of expenditure, thereby providing nuanced insights into the education-growth nexus. The results of the VECM reveal both the capital expenditure and recurrent expenditure significantly enhance economic growth in the long run in Nigeria. Based on the findings, the study recommends the need for strategic and efficient allocation of educational resources particularly in tertiary capital projects and recurrent funding for secondary education, as a means of fostering sustainable economic development and to optimize their growth-enhancing potential.

Keywords: Educational expenditure, Economic growth, VECM, Nigeria, Disaggregated spending, Public finance.

JEL Classification: H52, I22, I25, O40.

1. INTRODUCTION

The relationship between government expenditure and economic growth has remained a subject of debate in literature. Oyinlola and Akinnibosun (2013) trace the theoretical foundations of this debate to Wagner (1883), who argued that economic growth drives public spending, and Keynes (1936), who posited the reverse which indicates that public expenditure stimulates growth. Governments increase public

spending to drive economic activity, believing in its critical role in economic control and growth stimulation.

Scholars argue that government expenditure on socio-economic and physical infrastructure promotes economic growth. Okoro (2013) asserts that spending on education and health boosts labor productivity, thereby increasing national output, while investment in infrastructure such as roads, power, and communication lowers production costs and enhances private investment. However, expenditures may hamper growth due to negative effects from taxation and rising debt levels.

Government typically performs two main functions: protection and provision of public goods. Protection includes law enforcement and security, while provision covers sectors like education, health, and infrastructure. Many studies (Olaniyi & Adekanmbi, 2021; Abu & Abdullahi, 2010) support the view that public spending on infrastructure and human capital development enhances growth by raising productivity and reducing costs for the private sector.

Despite this theoretical consensus, not all countries achieve desired economic outcomes. Economic development involves not just growth but transformational changes. While Smith (1776) advocated for minimal government interference, Keynes (1936) argued that state intervention is necessary to counter market failures and stimulate aggregate demand. Knoop (1999) found that reducing government size negatively affects economic welfare, though some studies disagree, suggesting large governments may also hinder growth through inefficiencies.

Another strand of literature critiques the efficiency of government spending, particularly where political motives lead to investments in unproductive projects. Such misallocation can hinder growth. Barro (1991) argued that excessive taxation or borrowing to finance public expenditure can suppress innovation, crowd out private investment, and slow economic growth.

Public investment in education is widely believed to influence growth both directly via the Keynesian multiplier and indirectly through knowledge acquisition. From 1970 to 2010, Nigeria's education spending rose steadily, averaging 5.7% of total government expenditure. However, capital expenditure exceeded recurrent only until 1980; since then, recurrent spending has dominated. Despite this rise, outcomes remained poor. Secondary school enrollment remains low (under 40%), and real GDP per capita growth averaged just 0.602%, indicating a disconnect between education spending and actual economic performance.

This discrepancy could stem from a flawed conceptualization of the education-growth relationship. Hence, this study examines both the direct and indirect effects of public education spending on economic growth in Nigeria. From 1981 to 2016, education spending continued to rise, averaging 5.7% of total government expenditure, though still far below UNESCO's 26% benchmark. Capital education expenditure surpassed recurrent until 1985, but the trend reversed post1986. For instance, the budget allocation to education rose from ₦367.73 billion in 2015 to ₦541 billion in 2016 indicating a 49% increase. Yet, the impact on GDP

growth has remained marginal (National Bureau of Statistics and Trading Economics, 2018).

This raises important questions about the effectiveness of educational spending. Specifically, does disaggregated education expenditure by type or level positively influence economic growth? This study seeks to empirically investigate both the short-run and long-run relationship in the Nigerian context from 1981 to 2023.

2. LITERATURE REVIEW

Government expenditure encompasses all forms of public spending such as consumption, investment, and transfers aimed at achieving specific socio-economic objectives (Churchill et al, 2015). Key components include spending on education, health, defense, social security, etc. Education expenditure, in particular, is categorized into recurrent and capital spending.

According to the OECD (2018), education expenditure includes direct spending on institutions and related subsidies to households managed by these institutions. The World Bank (2018) defines it as operating expenses, including wages and salaries but excluding capital investments. It covers all educational levels from primary to tertiary and reflects government priority through its share in GDP and total public expenditure (OECD, 2018). Public spending spans ministries, local authorities, and other agencies involved in education.

Recurrent education expenditure refers to ongoing annual costs such as salaries, wages, allowances, goods, and services. It excludes capital assets and includes all transfers by federal, state, or local governments for education. However, capital expenditure involves long-term investments such as construction of school buildings, provision of equipment, hostels, libraries, and laboratories. These expenditures depend on fund availability and the government's ability to sustain associated recurrent costs.

UNESCO defines school enrolment as the gross enrolment ratio which is the total number of students enrolled (regardless of age) relative to the population in the official age group for a given education level. This metric is often used to assess education access and performance.

Investment in education, a key component of human capital, is crucial for economic growth, as recognized by the endogenous growth model (Churchill, et al. 2015). However, Nigeria's investment in education has historically fallen short. For example, public education expenditure was only 2.3% of GDP in 1998 and 14.2% of total government spending (Hinchliff, 2002). Between 2010 and 2014, the average allocation was 7.53%, dropping slightly to 7.05% during 2015-2016 despite overall budget increases (Olaniyi & Adekanmbi, 2021).

Economic growth refers to the increase in a country's output per capita overtime. It is typically measured as the annual percentage change in real Gross Domestic Product (GDP), which reflects the inflation-adjusted value of all goods and

services produced. Real GDP accounts for value-added by producers, taxes, and excludes subsidies, depreciation, and environmental degradation.

Empirical literature consistently highlights the nuanced relationship between education financing and economic growth, with variations across developed, developing, and Nigerian contexts. In developed countries, recent studies underscore the positive and significant impact of education spending on economic performance, particularly when investments are targeted and efficiently managed. For instance, Sanchez and Ortega (2022) demonstrated that increased education expenditure among OECD countries is associated with measurable GDP growth, especially when funds support early childhood and tertiary education, with a clear emphasis on developing STEM and digital skills. Supporting this, Baker et al. (2021) found that investments in vocational education in Germany and Nordic countries enhanced labor productivity and employment. However, as Zhang and Wilson (2023) caution, the benefits of increased funding are contingent upon efficient resource allocation and governance; inefficient or excessive spending can yield diminishing returns, highlighting the need for prudent fiscal management.

The broader empirical landscape reveals mixed findings regarding government spending and economic growth, shaped by differences in methodologies, country contexts, and time periods. Some studies, such as Loizides and Vamvoukas (2005) for the UK and Ireland, and Liu (2008) for the US, affirm the Keynesian view that government expenditure—particularly in education—can drive growth. Others, like Dissou et al. (2016), highlight that the mode of financing (non-distortionary versus distortionary taxes) significantly shapes the growth effects of education spending. Moreover, Aschauer (2000) and Gylfason and Zoega (2003) emphasize the complementary roles of public and private investment in education, with positive spillovers for income equality and human capital formation.

In developing countries, the relationship between education expenditure and economic outcomes is positive but highly dependent on the quality of governance and the initial human capital base. Evidence from Sub-Saharan Africa and Southeast Asia shows that increased education spending often leads to higher GDP per capita and reduced income inequality, particularly when funds are directed effectively and corruption is minimized (Mensah & Gyimah-Brempong, 2022; Tan & Rahman, 2023). Disaggregated analyses, such as those by Olaniyan et al. (2021), reveal that investments in primary education yield immediate social benefits, while tertiary education financing drives longer-term economic growth and innovation. Nevertheless, the literature also identifies context-specific challenges: while some studies affirm significant growth effects from education investment (Musila & Balassi, 2004; Kweka & Morrissey, 2000), others find the impact to be limited or dependent on complementary investments in health and infrastructure (Al-Shatti, 2014; Nketia-Amponsah, 2009).

In Nigeria, empirical evidence presents a complex and sometimes paradoxical picture. Several studies confirm a positive long-run relationship between education spending and economic growth, particularly when expenditures target tertiary education and science and technology (Adeleke & Yusuf, 2022; Ojo &

Adeyemi, 2024). Recurrent expenditure, such as teacher salaries and operational costs, appears to have a stronger and more direct link to human capital development compared to capital investments in infrastructure, which are often diluted by corruption and inefficiencies (Eze & Okafor, 2023). However, primary education spending yields limited economic returns unless coupled with quality enhancements and health interventions (Ogunleye et al., 2021). Despite recurrent findings of positive associations, other studies highlight inefficiencies, weak fiscal management, and instances where education spending has not translated into meaningful economic growth (Adewara & Oloni, 2012; Ayara, 2003; Uche & Ibrahim, 2023). This suggests that while education financing is crucial, its impact is mediated by the quality of governance, fiscal discipline, and the broader socioeconomic environment.

3. METHODOLOGY

3.1. THEORETICAL FRAMEWORK AND MODEL SPECIFICATION

This study is anchored on the Wagner's law of increasing state activities, which have been argued by different Scholars as a universal truth in recent years. It is a fact that economic growth of a country has always been accompanied by increasing state activities and, hence increasing public expenditure. Wagner's hypothesis provides the most suitable framework for explaining economic factors, as the most important determinant of an expanding public sector in order to increase the growth in the economy (Gaurav, 2011). Also, Wagner's law was based on the facts that there is a functional relationship between the growth of an economy and the growth of government activities. That is.

$$GDP = f(GE) \tag{1}$$

Where: GDP = Gross Domestic Product
GE = Government Expenditure

In the explicit form, equation (1) can be re-specified as:

$$\text{GDP} = \beta_0 + \beta_1 AE + \beta_2 HE + \beta_3 ED + \beta_4 ESS + \beta_5 EADM + \mu_t \tag{2}$$

Where: AE is Agricultural Expenditure, HE is Health Expenditure, EDisEducation Expenditure, $ESS$is Expenditure on Social Services and EADM isExpenditure on Administration

The purpose of the government activities is to meet the economic needs of the people. According to World Bank (2018), education expenditure refers to the current operating expenditures in education, including wages and salaries and excluding capital investments in buildings and equipment. This implies that part of government expenditure can be disaggregated into capital and recurrent component and re-specified as:

$$GDP = f(GEE) \tag{3}$$

Where: GEE is Government expenditure on education

However, this study will adapt the work of Kabuga and Hussaini (2015) because the study disaggregates the government expenditure into two basic variables, namely capital expenditure on education and recurrent expenditure on education, which is in line with the main objective of this research work and specified the model as thus:

$$GDP = f(CEE, REE) \quad (4)$$

Where: $CEE$is Capital Government expenditure on education

$REE$is Recurrent Government expenditure on education

Re-specifying the model in an implicit form.

$$\text{GDP} = \beta_0 + \beta_1 CEE + \beta_2 REE + \beta_2 ENR + \mu_t \quad (5)$$

Where *ENR* is Students Enrolment

4. RESULTS AND DISCUSSIONS

4.1. UNIT ROOT TEST

Augmented Dickey-Fuller (ADF) test is conducted to verify the stationarity properties of the variables. The result in Table 1 indicates that the series are all stationary at first difference and at 1% level of significance apart from GCEE which is stationary at 5%level of significance. When variables have a stationary series of I (1), there is a possibility of co-integration (the existence of a long-run relationship) among them.

Table 1: *Unit Root Test*

		AUGMENTED DICKEY-FULLER TEST				
Variables	Level	1st Difference	Order of Integration	1%	5%	10%
GDP	-0.52	-5.04*	I(1)	-4.27	-3.56	-3.21
ENR	-2.76	-4.62*	I(1)	-4.27	-3.56	-3.21
GREE	-1.89	-4.61*	I(1)	-4.27	-3.56	-3.21
GCEE	-0.160116	-4.108766*	I(1)	-4.27	-3.56	-3.21

Source: Author's Computation, 2025

4.2. CO-INTEGRATION ANALYSIS

A co-integration test was performed using the Johansen co-integration approach to find out whether there is a long-run relationship among the variables employed for this study in order to avoid biased results. Hence, the Johansen co-integration test for GDP, ENR, GREE, and GCEE are presented in Table 3.

Table 2: *Johansen Co-integration Test*

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.856375	153.9007	69.81889	0.0000

At most 1 *	0.743307	91.80314	47.85613	0.0000
At most 2 *	0.643023	48.28720	29.79707	0.0001
At most 3	0.364336	15.32450	15.49471	0.0530
At most 4	0.025476	0.825791	3.841466	0.3635

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's Computation, 2025

Table 2 above reveals the co-integration result tests for long run relationship between the dependent variable and the independent variables For rank (0), since the trace statistics (153.9) is more than 5% critical value (69.81) and the probability value of 0.0000, we reject the null hypothesis (that there is no co-integration among variables). Otherwise, accept the alternate hypothesis indicating that there is a long run relationship among the variables. In fact, the Trace test indicates 3 co-integrating equations at the 0.05 level of significance.

4.3. VECTOR ERROR CORRECTION ESTIMATES RESULT

Table 3: *Estimated VECM Results*

Equation	**D(GDP)**	**D(ENR)**	**D(GREE)**	**D(GCEE)**
ECM	0.204643	-0.368495	0.026139	0.005600
	(0.12367)	(1.21087)	(0.01383)	(0.01062)
	[1.65479]	[-0.30432]	[1.89057]	[0.52714]
D(GDP(-1))	0.156231	-0.070136	-0.106431	0.036819
	(0.47480)	(4.64895)	(0.05308)	(0.04078)
	[0.32904]	[-0.01509]	[-2.00498]	[0.90277]
D(GDP(-2))	-0.952719	-2.038877	-0.001120	0.023228
	(0.55241)	(5.40891)	(0.06176)	(0.04745)
	[-1.72465]	[-0.37695]	[-0.01813]	[0.48951]
D(ENR(-1))	0.049871	-0.002357	0.005369	0.000955
	(0.02136)	(0.20911)	(0.00239)	(0.00183)
	[2.33521]	[-0.01127]	[2.24880]	[0.52071]
D(ENR (-2))	-0.015495	0.051313	-0.000814	0.001895
	(0.02336)	(0.22874)	(0.00261)	(0.00201)
	[-0.66328]	[0.22433]	[-0.31171]	[0.94415]
D(GREE(-1))	-2.023743	10.56768	0.125767	-0.508426
	(3.49773)	(34.2476)	(0.39105)	(0.30045)
	[-0.57859]	[0.30857]	[0.32161]	[-1.69222]
D(GREE(-2))	6.596636	22.36279	0.030417	-0.523584
	(3.12821)	(30.6295)	(0.34974)	(0.26871)
	[2.10876]	[0.73011]	[0.08697]	[-1.94853]
D(GCEE(-1))	8.603583	78.08460	0.087160	-0.367215
	(3.70817)	(36.3081)	(0.41458)	(0.31852)
	[2.32017]	[2.15061]	[0.21024]	[-1.15287]
D(GCEE(-2))	-1.248235	-7.485100	0.381932	-0.025700
	(3.45609)	(33.8399)	(0.38640)	(0.29687)
	[-0.36117]	[-0.22119]	[0.98845]	[-0.08657]

C	991.1630	-3668.923	138.1812	61.86529
	(569.923)	(5580.33)	(63.7180)	(48.9552)
	[1.73912]	[-0.65747]	[2.16864]	[1.26371]
R-squared	0.705109	0.560900	0.851569	0.646578
Adj. R-squared	0.534383	0.306685	0.765635	0.441966
F-statistic	4.130060	2.206397	9.909570	3.160015
Log likelihood	-259.5167	-330.2433	-191.5947	-183.4243
Akaike AIC	17.51721	22.08021	13.13514	12.60802

Source: Authors' computation 2025

The result presented in Table 3 revealed that the estimated VECM of the first lag of gross domestic product ((GDP (-1)), first lag of Students enrolment ((ENR (-1)), and first lag of government capital expenditure ((GCE (-1) have positive impact on gross domestic product (GDP)) while first lag of government recurrent expenditure ((GRE (-1)) have negative impact on gross domestic product (GDP) and therefore it doesn't conform with a' priori expectation or theoretical framework. In terms of magnitude, a 10% change in ((GDP (-1)), ((ENR (-1)) and ((GCE (-1) will enhance gross domestic product by 1.5%, 0.4%, and 8.6%, respectively. On the other hand, a 10% change in ((GRE (-1)) will decrease gross domestic product by -2% respectively.

However, the first lag of student enrolment ((ENR (-1)), first lag of government recurrent expenditure on education ((GREE (-1) and first lag of government capital expenditure on education ((GCEE (-1)) have positive impact on government recurrent expenditure while first lag of gross domestic product ((GDP (-1)) have negative impact on government recurrent expenditure therefore it doesn't conform with 'a priori' expectation or theoretical framework. In terms of magnitude, a 10% change in ((ENR (-1)), ((GREE (-1)) and ((GCEE (-1)) will enhance government recurrent expenditure by 0.05%, 1.3% and 0.9%, respectively. On the other hand, a 10% change in ((GDP (-1)) deteriorated government recurrent expenditure by -1.0% respectively.

First lag of gross domestic product ((GDP (-1)) and first lag of students enrolment ((ENR (-1)) have positive impact on government capital expenditure on education ((GCEE (-1)) while first lag of government recurrent expenditure on education ((GREE (-1)) and first lag of government capital expenditure ((GCEE (-1)) have negative impact on government capital expenditure therefore it doesn't conform with a' priori expectation or theoretical framework. In terms of magnitude, a 10% change in ((GDP (-1)) and ((ENR (-1)) enhanced GCEE by 0.3%, 0.01% and 0.001%, respectively. On the other hand, a 10% change in ((GREE (-1)) and ((GCEE (-1)) will deteriorate government capital expenditure by -5% and -3.6% respectively.

Furthermore, all their overall tests reveal that the incorporated variables are simultaneously significant at 5% during the reviewed period. The adjusted R-square for all the variables revealed a total of explained variation up to 53% changes in economic growth is accounted by the explanatory variables.

5. CONCLUSION AND POLICY RECOMMENDATIONS

This study examined the impact of disaggregated government educational expenditure on economic growth in Nigeria from 1981 to 2023. The findings revealed that student enrolment and capital expenditure on education have a positive and significant impact on economic growth. A long-run relationship exists between disaggregated educational expenditure and economic growth. However, recurrent expenditure exhibited a negative impact on growth, contrary to theoretical expectations. The study confirms that disaggregated educational spending significantly influences Nigeria's economic growth. In line with the endogenous growth theory, educational investment remains a vital tool for achieving economic development. However, the negative effect of recurrent expenditure suggests inefficiencies in wage structures and resource allocation within the education sector. This indicates that sub-optimal recurrent spending may hinder rather than enhance growth. The study concludes that inefficient use of recurrent educational funds undermines their potential to support sustainable economic development.

Based on the findings of a strong positive impact of capital expenditure on GDP which underscores the importance of investing in educational infrastructure. Government should scale up funding for school facilities, laboratories, and ICT to promote long-term productivity and economic growth.
The findings of a negative relationship between recurrent expenditure and GDP call for better allocation and monitoring of these funds. Thus, policies should focus on minimizing administrative inefficiencies and redirecting recurrent spending toward quality-improving components such as teacher training and curriculum enhancement.

Since student enrolment significantly affects both recurrent and capital expenditure, policy makers should integrate demographic and enrolment forecasts. This helps ensure responsive funding mechanisms that meet actual education demand without overstretching government resources.

Finally, given the overall significance of education-related variables in explaining growth, policymakers should integrate education sector development into broader economic strategies, recognizing it as a cornerstone for sustainable development.

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