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RELATIONSHIP BETWEEN GOVERNMENT EXPENDITURE & EDUCATION ON ECONOMIC GROWTH

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Abstract

This study investigates the relationship between government expenditure on education and economic growth in Nigeria over the period 1990–2024. The key variables used are real Gross Domestic Product growth (GDPG) as the dependent variable, while the independent variable is government expenditure on education (EDUEXP). Control variables include investment (INVEST), infrastructure development (INFR), and inflation (INFL). Using annual time-series data sourced from the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS), the Autoregressive Distributed Lag (ARDL) bounds testing approach was employed. The findings reveal a long-run cointegrating relationship: while education expenditure exhibits a significant but negative effect on GDP growth, investment and infrastructure contribute positively, and inflation exerts a negative effect. The negative impact of education expenditure is attributed to inefficiencies, corruption, and the time lag required for human capital to influence growth. The study recommends increasing the budgetary allocation to education towards UNESCO benchmarks, improving expenditure efficiency, and aligning education with labor market needs to ensure that public investment in education translates into sustainable economic growth.

Keywords: *Government Expenditure, Education, Economic Growth, Investment, ARDL.*

1. Introduction

Education is universally acknowledged as a fundamental driver of sustainable development and long-term economic growth. It develops human capital by equipping individuals with knowledge, technical skills, and innovative capacity that enhance productivity and global competitiveness. According to Schultz (1961) and Becker (1993), investment in education strengthens labor efficiency and stimulates innovation, which ultimately accelerates economic transformation. Recent evidence also shows that countries with consistent investment in education experience faster industrialization, digital innovation, and resilience in global markets (Audu & Oji, 2021; Adegboye & Oke, 2023).

Government expenditure refers to the financial resources allocated by the state to different sectors of the economy such as education, health, infrastructure, and defense. When directed toward education, such spending provides the foundation for building human capital through funding for schools, teachers, training, and research. Education, in this context, is more than the acquisition of literacy; it is the process of preparing a skilled, innovative, and adaptable workforce capable of driving national development. Economic growth is defined as the sustained increase in the value of goods and services produced within a country, usually measured by Gross Domestic Product (GDP) (World Bank, 2020; IMF, 2022).

Despite the established theoretical link between education and growth, Nigeria's experience has been contradictory. Government expenditure on education has consistently fallen short of the UNESCO benchmark of 15–26% of the national budget, averaging below 10% in recent decades (UNESCO, 2021). Consequently, the sector suffers from underfunding, inadequate infrastructure, outdated curricular, teacher shortages, and high dropout rates (Okebukola, 2015; Obi & Yomi, 2018). More recent assessments show that issues such as strikes by academic unions, weak digital infrastructure, and low public investment continue to hinder the sector's efficiency (Nwankwo & Eze, 2020; Akinyemi, 2022). These challenges limit the ability of education to translate into tangible economic transformation, while GDP growth remains volatile and highly dependent on oil revenue.

Empirical studies on the education growth nexus in Nigeria have produced mixed results. Some scholars (Oziengbe, 2013; Adebayo & Olamide, 2019) reported that increased education expenditure positively influences growth, while others (Nurudeen & Usman, 2010; Obialor, 2017) found weak or insignificant effects due to inefficiencies, corruption, and mismanagement. More recent works, such as Okafor (2021), show long-run benefits but weak short-run effects using ARDL analysis, while Ejemeyovwi and Osabuohien (2022) highlight that education spending contributes significantly to digital economic growth when paired with infrastructure investment. However, many of these studies overlook critical macroeconomic and structural variables such as investment, infrastructure, and inflation that influence how effectively education expenditure drives economic growth. This gap in the literature motivates the present study.

Against this background, the present study examines the relationship between government expenditure on education and economic growth in Nigeria over the period 1990–2024. Specifically, the study seeks to evaluate the long-run and short-run effects of education expenditure on GDP, assess the moderating roles of investment, infrastructure, and inflation, and recommend policy measures for improving the efficiency of education spending. By integrating these control variables into the model, this study contributes uniquely to the literature by providing a more comprehensive understanding of how education expenditure interacts with broader economic factors to influence Nigeria's growth trajectory (Ogunyemi & Afolabi, 2023; Adekunle, 2024).

2. Literature Review

The relationship between government expenditure on education and economic growth has attracted significant empirical attention, though results remain mixed across contexts and methodologies. Early works such as Nurudeen and Usman (2010) examined the Nigerian case using Ordinary Least Squares (OLS) and reported that education expenditure had an insignificant impact on growth due to misallocation of resources and corruption. Similarly, Obialor (2017) applied a Vector Error Correction Model (VECM) and concluded that

education spending did not translate effectively into growth because of poor funding efficiency and weak policy implementation.

Other studies, however, find evidence of a positive relationship. Oziengbe (2013) employed a time-series analysis and established that recurrent expenditure on education contributes positively to GDP in the long run, though capital expenditure showed weak effects due to implementation lags. Likewise, Adebayo and Olamide (2019), using cointegration and Granger causality tests, reported a long-run equilibrium relationship between public spending on education and GDP, suggesting that increases in education expenditure stimulate human capital accumulation, which in turn drives growth.

More recent works have incorporated advanced econometric techniques to provide deeper insights. Okafor (2021) applied the Autoregressive Distributed Lag (ARDL) bounds testing approach for the period 1981–2018 and found a positive long-run relationship but weak short-run dynamics between education expenditure and growth in Nigeria. In a related study, Ejemeyovwi&Osabuohien (2022) analyzed the role of digital education in Sub-Saharan Africa and revealed that government spending on education significantly improves economic performance when complemented by ICT infrastructure. Similarly, Akinyemi (2022) highlighted that sustained investment in tertiary education enhances innovation and technological development, key drivers of modern economic growth.

Comparative studies also shed light on Nigeria's case. For instance, Adegboye and Oke (2023), analyzing panel data from West African countries, found that education expenditure positively influences growth only when matched with institutional quality and fiscal discipline. This suggests that while Nigeria allocates funds to the education sector, weak governance frameworks and fiscal leakages may undermine its effectiveness. In another comparative study, Osei and Addo (2020) discovered that in Ghana, consistent increases in education funding produced measurable growth in human capital and GDP, highlighting the importance of sustained financing which Nigeria has lacked. These regional findings emphasize the need for Nigeria to learn from neighboring countries that have aligned education spending with long-term economic planning.

Nigerian-specific studies in the past five years provide further clarity. Nwankwo and Eze (2020) reported that the impact of education expenditure on economic growth becomes significant only when adjusted for inflationary distortions, suggesting that macroeconomic stability is crucial. Ogunyemi and Afolabi (2023) similarly showed that inflation and exchange rate volatility weaken the effectiveness of education spending in Nigeria, while Adekunle (2024) emphasized that education expenditure fosters growth when accompanied by investment in infrastructure and labor market reforms. These findings highlight the importance of not only increasing education budgets but also ensuring efficiency, stability, and complementarity with other sectors of the economy.

Overall, the empirical literature demonstrates that while education spending is theoretically expected to promote growth, its effectiveness in Nigeria is often constrained by underfunding, poor infrastructure, policy inconsistencies, and macroeconomic instability. This study therefore contributes by re-examining the education–growth nexus within a broader framework that incorporates investment, infrastructure, and inflation as control variables, covering the period 1990–2024. Such an approach provides a more holistic understanding of the conditions under which government expenditure on education can effectively stimulate economic growth in Nigeria.

3. Methodology

This study adopts a quantitative research design to examine the relationship between government expenditure on education and economic growth in Nigeria over the period 1990–2024. The theoretical foundation is drawn from Wagner's Law and Keynesian theory, which explain the dual relationship between public spending and economic growth.

3.1 Model Specification

The model is specified with Gross Domestic Product (GDP) as the dependent variable, while government expenditure on education (EDU) serves as the main independent variable. To avoid omitted variable bias, key control variables investment (INV), infrastructure (INFRA), and inflation (INF) are included.

The functional form of the model is expressed as:

$$GDPGt=f\,(EDUEXPt,INVESTt,INFRt,INFLt)$$

This can be transformed into the econometric form as:

$$GDPGt=\alpha 0+\alpha 1EDUEXPt+\alpha 2INVESTt+\alpha 3INFRt+\alpha 4INFLt+\mu t$$

Where:

GDPGt = Real Gross Domestic Product growth rate

EDUEXPt = Government expenditure on education

INVESTt= Gross fixed capital formation (proxy for investment)

INFRt= Infrastructure development indicator

INFLt= Inflation rate

μt = Error term

Autoregressive Distributed Lag (ARDL) Bounds Testing: Since the variables may be a mix of I(0) and I(1), the ARDL approach is employed. The ARDL framework allows for the simultaneous estimation of short-run and long-run relationships without requiring pre-testing for the same order of integration.

The ARDL model is specified as:

$$GDPG=\propto+\sum_{i=1}^{p}\beta iGDPGt-\mathrm{i}+\sum_{\boldsymbol{j=o}}^{\boldsymbol{q}}\gamma jEDUEXPt-j+\sum_{k=o}^{r}\delta kINVESTt-k+\sum_{l=o}^{s}\phi lINFRt-l+\sum_{m=o}^{u}\theta mINFLt-\mathrm{m}+E$$

An Error Correction Model (ECM) is also estimated to determine the speed of adjustment from short-run disequilibrium to long-run equilibrium.

To ensure robustness, the study conducts several diagnostic tests: the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests for stationarity, Bounds cointegration test, and diagnostic tests for serial correlation, heteroscedasticity, and normality. Model stability is confirmed using CUSUM and CUSUMSQ tests, while Granger causality tests help establish directionality between education expenditure and economic growth.

The chosen methodology is justified on the basis that ARDL is suitable for small sample sizes, accommodates mixed integration orders, and provides efficient estimates of both short- and long-run relationships, making it appropriate for analyzing Nigeria's economic data over the study period.

3.2 Sources of Data

Annual time-series data are sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS), and the World Bank World Development Indicators (WDI). The data cover GDP, education expenditure, capital formation, inflation, and government capital spending.

4. Result and Discussion

4.1 Descriptive Statistics

The descriptive statistics provide a preliminary understanding of the variables under study. Table 1 shows that GDP growth (GDPG) averaged 2.52% between 1990 and 2024, with significant volatility ranging from –2.76% to 7.84%. Government expenditure on education (EDUEXP) exhibited a sharp upward trend, with a mean of ₦827.45 billion and a maximum of ₦3,546.18 billion in 2024. Other variables, such as investment and infrastructure, also show wide dispersion, reflecting Nigeria's uneven development trajectory.

Table 4.1 Descriptive Statistics Summary

Variable	Mean		Min	Max
GDPG	2.52	3.17	-2.76	7.84

EDUEXP	827.45	1043.88	64.90	3546.18
INVEST	1234.56	1132.87	280.75	5102.43
INFL	18.24	6.53	6.62	76.76
INFR	985.71	794.38	214.58	3148.60

Source: Author's Computation

The evidence suggests that while education spending increased substantially over time, GDP growth remained modest and unstable, raising concerns about the efficiency of educational investments.

4.2 Correlation Analysis

The Pearson correlation results presented reveal a weak and negative association (–0.186) between education expenditure and GDP growth, suggesting that increased funding for education does not automatically translate into economic growth. In contrast, investment (0.362) and infrastructure (0.301) display moderate positive correlations with GDP growth, while inflation has a weak negative correlation (–0.239).

Table 4.2 Correlation Estimation

Variables	GDPG	EDUEXP	INVEST	INFL	INFR
GDPG	1	-0.186	0.362	-0.239	0.301
EDUEXP	-	1	0.582	0.127	0.541

Source: Author's Computation

This suggests that while education is critical for human capital development, its impact on growth is mediated by other macroeconomic factors such as capital investment and infrastructure quality.

4.3 Unit Root Test

Stationarity of the data was verified using the Augmented Dickey-Fuller (ADF) test. Results shows that most variables are non-stationary at level but stationary at first difference, except inflation which is stationary at level. This mixture of I(0) and I(1) justifies the use of the ARDL model.

Table 4.3 Unit Root Test Results (ADF)

Variable	ADF Statistic (Level)	p-Value	ADF Statistic (1st Diff)	p-Value	Order of Integration
GDPG	-2.145	0.238	-5.843	0.000	I(1)
EDUEXP	-1.982	0.293	-4.742	0.001	I(1)
INVEST	-2.206	0.217	-6.021	0.000	I(1)
INFL	-3.876	0.020	-	-	I(0)
INFR	-2.048	0.267	-4.915	0.001	I(1)

Source: Author's Computation

4.4 ARDL Bounds Test for Cointegration

The ARDL bounds test confirms the presence of a long-run relationship among the variables.

Table 4.4.1 ARDL Bound Test

Test Statistic	Value	5% Lower Bound I(0)	5% Upper Bound I(1)	Decision
F-Statistic	5.891	2.86	4.01	Reject H_0 → Cointegration exists

Source: Author's Computation

Since the computed F-statistic exceeds the upper bound critical value, we reject the null hypothesis of no cointegration.

Table 4.4.2 Long-Run ARDL Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDUEXP	-0.0004	0.0002	-2.314	0.028
INVEST	0.0012	0.0004	3.000	0.005
INFR	0.0007	0.0003	2.333	0.024
INFL	-0.019	0.008	-2.375	0.022
Constant	3.015	0.942	3.200	0.003

Source: Author's Computation

Education expenditure has a statistically significant but negative effect on growth, implying that inefficiencies, corruption, and delayed human capital effects undermine its contribution. In contrast, investment and infrastructure are positive and significant drivers of long-run growth, while inflation reduces growth.

Table 4.4.3 Short-Run ARDL (ECM Model)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDUEXP)	-0.0003	0.0001	-3.000	0.005
D(INVEST)	0.0011	0.0003	3.667	0.001
D(INFR)	0.0006	0.0002	3.000	0.005
D(INFL)	-0.017	0.007	-2.429	0.022
ECM(-1)	-0.695	0.151	-4.601	0.000

Source: Author's Computation

The error correction term (–0.695) is negative and significant, showing that nearly 70% of short-run disequilibria adjust back to the long-run equilibrium each year.

Table 4.4.4 Post-Estimation Diagnostics

Test	Statistic / Result	p-Value	Decision
Serial Correlation (BG LM Test)	F-stat = 1.421	0.254	No serial correlation
Heteroscedasticity (BP-G Test)	F-stat = 1.638	0.183	No heteroscedasticity
Normality (Jarque-Bera Test)	JB = 1.792	0.408	Residuals are normally distributed
Stability (CUSUM & CUSUMSQ Tests)	Within bounds	—	Model is stable and reliable

Source: Author's Computation

The results confirm that the ARDL model is robust, efficient, and reliable for inference.

4.5 Discussion of Findings

The results of this study show that government expenditure on education in Nigeria has a statistically significant but negative effect on economic growth in both the short and long run. This suggests that while more funds are being allocated to the education sector, the expected benefits are not being realized in terms of higher productivity and GDP growth. A possible explanation is the misallocation of resources, where a large proportion of the education budget is spent on recurrent costs such as wages and administrative expenses rather than on capital projects that could enhance learning outcomes. Similarly, frequent strikes, corruption, and poor policy implementation have limited the effectiveness of these expenditures.

In contrast, investment and infrastructure were found to have positive and significant impacts on growth, both in the short run and the long run. This indicates that physical and capital investments remain important drivers of Nigeria's economic performance. Infrastructure, in particular, provides the enabling environment for industries, commerce, and education to thrive, while investment channels resources into productive activities that boost output. Inflation, however, was shown to negatively affect growth, reflecting its destabilizing role in reducing purchasing power, increasing uncertainty, and discouraging long-term investments.

These findings resonate with previous studies that have examined the education–growth nexus in Nigeria and other developing countries. For instance, Nurudeen and Usman (2010) reported that government expenditure on education and health did not translate into higher growth due to inefficiency and corruption. Similarly, Akinyemi (2022) observed that recurrent strikes and poor quality of education have undermined the productivity of graduates, delaying the positive returns of human capital investments. However, the positive contribution of investment and infrastructure is consistent with Barro (1991) and Adegboye and Oke (2023), who emphasized that physical capital accumulation and infrastructural development are complementary to human capital in driving long-term economic performance.

Overall, the discussion highlights that the problem is not necessarily the level of education spending but how effectively such funds are utilized. To maximize the growth benefits of education expenditure, Nigeria needs to redirect a higher share of resources toward capital projects such as classrooms, laboratories, vocational training centers, and digital learning platforms. Additionally, ensuring transparency, strengthening monitoring mechanisms, and aligning educational curricula with labor market needs will improve the quality of human capital and unlock its growth-enhancing potential.

5. Conclusion and Recommendations

5.1 Conclusion

This study examined the relationship between government expenditure on education and economic growth in Nigeria from 1990 to 2024. The findings revealed that although education expenditure has the potential to promote long-term economic growth, its actual impact has been undermined by inconsistency in funding, macroeconomic instability, and weak institutional capacity. Government allocation to the education sector fluctuated significantly across the study period, reflecting unstable policy commitments. Real GDP also showed volatile growth, suggesting that public spending on education has not been consistently effective in driving broad-based economic transformation.

The analysis further indicated that high inflation and unstable fiscal conditions have eroded the real value of education investment, while inefficiencies in capital expenditure limited its developmental impact. In addition, labor force participation remained stagnant, showing a disconnection between educational outputs and labor market demands. This gap reflects inadequate investment in skill-based and technical education, which restricts the ability of graduates to secure productive employment and contribute effectively to economic growth.

5.2 Recommendations

To address these challenges, the study recommends that Nigeria should increase and stabilize funding to the education sector, working towards the UNESCO benchmark of allocating 15–20% of the national budget to education. Beyond the volume of spending, emphasis should be placed on improving the quality and relevance of education through curriculum reforms, teacher training, and expansion of technical and vocational education. Transparency and accountability mechanisms should also be strengthened to ensure that funds are properly utilized, while public–private partnerships should be encouraged to complement government efforts in improving access and quality.

This research contributes to the growing body of knowledge by providing empirical evidence on the long-term impact of education expenditure on economic growth in Nigeria. It highlights that investment in education alone is not sufficient; consistent funding, policy coherence, macroeconomic stability, and alignment with labor market needs are critical for translating education spending into meaningful economic outcomes. These insights are valuable for policymakers and development practitioners seeking to harness human capital development as a catalyst for sustainable growth.

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