Government Expenditure on Education and Economic Growth in Nigeria

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Abstract
This study investigates the impact of educational expenditure on economic growth in Nigeria using time series data and the Autoregressive Distributed Lag (ARDL) methodology. The findings indicate that government expenditure on education has a negative and statistically insignificant impact on economic growth in both the short and long run. In contrast, labor productivity exhibits a significant positive impact on economic growth in the short run but not in the long run. Additionally, gross fixed capital formation and household consumption expenditure show positive effects on economic growth, though these are not statistically significant. The study highlights the inefficiency of current educational spending in promoting economic growth and suggests a reevaluation of government expenditure on education. Recommendations include focusing on programs that enhance skills and productivity, investing in infrastructure, implementing policies to boost household consumption, and improving data collection and analysis. These measures aim to foster a more robust economic environment and leverage education as a driver of sustainable economic growth in Nigeria.

Keywords*:* Educational expenditure, economic growth, autoregressive distributed lag, Nigeria

1.0 Introduction

Education's role in economic growth is multifaceted and pivotal for national economic development. It serves as a cornerstone for enhancing efficiency, raising awareness of opportunities, imparting crucial knowledge and skills, driving research and development, elevating living standards, and fostering broader participation in economic, social, and political spheres (Chima & Yusuf, 2023; Armeanu, Vintila, & Gherghina, 2018; Oluwatobi & Ogunrinola, 2011; Adelakun, 2011). Various studies, such as those by Salisu (2023), Nkoro and Uko (2019), Udeaja and Obi (2015), and Ajide (2014), highlight education's significant contribution as a source of economic growth alongside factors like physical capital and labor. Education acts as a catalyst by nurturing human capital, facilitating technological adaptation, fostering innovation, and bolstering productivity, thereby driving sustainable economic development (Chima & Yusuf, 2023; Ayeni & Omodue, 2018; Urhie, 2014).

Scholarly literature reveals several mechanisms illustrating the correlation between education, as a component of human capital, and economic growth. Mankiw, Romer, and Weil (1992) emphasize education's role in enhancing productivity, while Lucas (1988) and Romer (1990) argue that human capital development fosters innovation capacity, leading to technological advancements and productivity gains. Additionally, Benhabib and Spiegel (2002) underscore education's role in disseminating new knowledge, which fuels technological progress and, consequently, economic growth. Education emerges as a crucial factor in transitional programs, equipping individuals with essential knowledge, skills, and competencies necessary for functional participation in industry and overall development.

Nigeria, like many developing nations, confronts the ongoing challenge of achieving sustainable economic growth amidst complex socio-economic dynamics. Within this context, government expenditure on education emerges as a pivotal determinant influencing economic development trajectories. Despite considerable investments in education, Nigeria struggles with suboptimal economic growth rates and enduring developmental disparities, contrasting with findings emphasizing the necessity of education investment for economic success (Chima & Yusuf, 2023; Armeanu et al., 2018; Oluwatobi & Ogunrinola, 2011; Adelakun, 2011). This is worrisome and hence, the nexus between educational expenditure and economic growth in Nigeria needs more revelation. It is for this reason that this study is carried to revisit the effectiveness of government allocations to the education sector in fostering sustainable economic growth.

2.0 Literature Review

2.1 Conceptual Review

a. Government Expenditure on Education

According to Organisation for Economic Co-operation and Development, government expenditure on education covers expenditure on schools, universities and other public and private educational institutions (OECD, 2023). It includes instruction and ancillary services for students and families provided through educational institutions. UNESCO (2020) defines expenditure on education as expenditure on core educational goods and services, such as teaching staff, school buildings, or school books and teaching materials, and peripheral educational goods and services such as ancillary services, general administration and other activities. Expenditure on education can come from public source (i.e. all government ministries and agencies financing or supporting education programmes in the country), international source, and private source (e.g. households).

Under UNESCO's National Education Accounts (NEA) framework, a country's education expenditure comes from three main sources: government or public sector, private sector (households and firms), and the] rest of the world (through grants and aid) (UNESCO 2016). These funds may be used for different levels of education inclsuding preprimary, primary, secondary, technical-vocational, tertiary, and non-formal. Educational expenditure includes current expenditures (such as teaching and nonteaching staff compensation, textbooks and other teaching materials, and other goods and services) and capital expenditures, (De Guzman, 2020).

According to the World Bank (2019), expenditure on education includes all expenditures made, on the national territory, by all economic agents, central and local government, companies and households, for educational activities. These activities include academic and extra-curricular teaching at all levels, organisation of educational system (general administration, educational guidance and education research), activities intended to encourage attendance at school (catering and boarding facilities, school medical services, school transport) and expenses requested by schools (supplies, books, clothing).

Government expenditure on education refers to the component of education expenditure that comes from national, regional, and local government units to finance and/or produce educational services, (De Guzman, 2020). It comprises of recurrent and capital expenditure on education. Recurrent expenditure on education is the expenses borne to fulfill day to day services like salary to teachers and staff. Similarly capital expenditure on education is the expenditure incurred to do development work and it comprises of returns after the year of investment too.

For the purpose of this study, education expenditure is defined as both the recurrent and capital expenditures incurred by the Federal Government of Nigeria in providing educational services to Nigerians measured in Naira.

b. Economic Growth

Todaro (2007) defined the term economic growth as a process by which the productive capacity of the economy is increased over time to bring about raising level of national output and

income. According to Guru and Yadav (2016), economic growth can be defined in two ways. In one way, economic growth is defined as sustained annual increases in an economy's real national income over a long period of time. In other words, economic growth means rising trend of net national product at constant prices. This definition has been criticized by some economists as inadequate and unsatisfactory. They argue that total national income may be increasing and yet the standard of living of the people may be falling. This can happen when the population is increasing at a faster rate than total national income. Hence, the second and better way of defining economic growth is to do so in terms of per capita income. According to the second view of Guru and Yadav (2016) economic growth means the annual increase in real per capita income of a country over the long period.

To Kessier (2012), economic growth occurs when a society becomes more productive and is able to produce more goods and services. The offering of new goods and services makes economic growth positive but when economic growth is negative for two quarters, we say we are in a recession. International Monetary Fund (2012) defined economic growth as the increase in the inflation adjusted market value of goods and services produced by an economy over time. Uwakaeme (2015) defined economic growth precisely and concisely to mean the positive and sustained increase in aggregate goods and services produced in an economy within a specified time period.

Economic growth according to Wilson (2008) is a process of sustained rise in material output, so that the physiological or material needs of man can be continually met as these needs (his demands, tastes and expectations) rise. It is a process in which investment improves the quality of existing physical and human resources, or of specific resources through invention, innovation, technological progress and managerial capacity have been and continue to be primary factors. To Haller (2012), economic growth is an increase in per capita income of a nation, and it involves the analysis, especially in quantitative terms, of the process, with a focus on the functional relationship between the endogenous variables. In a wider sense, it involves the increase in the GDP, GNP and National income, therefore of the national wealth, including the production capacity expressed in both absolute and relative size, per capita, encompassing also the structural modification of the economy.

From the above definitions it is essential to understand that economic growth basically entails a long run process by which a nation's wealth increases. Economic growth is concerned with increase in the level and volume of production linked with large increase in the productive ability of the economy, which result in the reduction of poverty and unemployment in a country. For the purpose of this study, economic growth can therefore be seen as the annual increase or improvement in the real per capita income (real GDP per capita or output per person) of a country over a long period of time. This is measured using annual real GDP which is the monetary value of all final goods and services at market prices with year 2010 as the base year.

2.2 Theoretical and Literature review

The study is anchored on the human capital theory and the endogenous growth theory. Human capital theory posits that, the source of divergence in economic performance and the rate of growth between countries is human capital. According to the human capital idea, acquiring more education and training in specific abilities can boost a person's capacity for production. Therefore, investments in education and training contribute to the accumulation of human capital, which in turn enhances productivity and economic growth. In the context of Nigeria, increased government spending on education can lead to improvements in the quality and quantity of human capital, thus driving economic growth. Endogenous growth theory on the other hand, emphasizes the role of factors such as human capital, innovation, and technology in driving economic growth. In the case of Nigeria, increased government expenditure on education can lead to the development of human capital, which in turn stimulates innovation and technological progress, ultimately fostering economic growth.

Studies on the relationship between educational expenditure and economic growth consistently demonstrate that investing in education plays a crucial role in enhancing economic development. This is achieved by increasing individual efficiency, raising awareness of opportunities,

imparting knowledge and skills, fostering research and development, improving living standards, and boosting participation rates in economic, social, and political activities. For example, Owusu-Nantwi (2015) analyzed the relationship between education expenditures and economic growth in Ghana from 1970 to 2012, using vector error correction and cointegration analysis. The findings indicated a long-run positive and significant relationship between education spending and real GDP, gross capital formation, and labor force participation, suggesting that education significantly contributes to Ghana's long-term economic growth. Similarly, Jackson, Rucker, and Persico (2015) examined the effects of school spending on educational and economic outcomes in the United States. They found that a 10 percent increase in per-pupil spending over twelve years of public school leads to 0.27 more completed years of education, 7.25% higher wages, and a 3.67 percentage-point reduction in annual adult poverty, with more pronounced effects for children from low-income families. The improvements were linked to better school quality, including reduced student-to-teacher ratios, increased teacher salaries, and longer school years.

In Nigeria, Obi and Obi (2014) used time series data from 1981 to 2012 and found a positive relationship between education expenditure and economic growth, although a long-run relationship was absent due to labor market distortions and other issues such as brain drain. They recommended a comprehensive overhaul of the education system to improve its performance. Chima and Yusuf (2023) also found that health and education expenditures positively affected GDP growth in both the short and long run, while factors like inflation and exchange rate had negative impacts. They suggested improving education expenditures, stabilizing inflation, and enhancing national investment to foster long-term economic growth.

Ayeni and Omobude (2018) observed that while recurrent educational expenditure positively affected economic growth, capital expenditure did not have a significant impact, attributing this to policy mismatches and inadequate funding. They recommended prioritizing capital expenditures to stimulate economic growth. Urhie (2014) highlighted that public education expenditure has both direct and indirect effects on economic growth, with recurrent expenditure positively impacting growth while capital expenditure had a negative impact.

Iyabode and Umar (2020) found that all levels of education expenditure contributed positively to economic growth, with tertiary education having the most significant impact. They recommended improved funding for all education levels and better economic diversification policies. Okerekeoti (2022) confirmed a positive and significant relationship between government education expenditure and economic growth, advocating for increased public spending on education.

Bosco, Omekwe, and Obayori (2019) reported that both capital and recurrent expenditures on education were positively and significantly related to economic growth, suggesting increased financing for education, particularly in tertiary education. Kabuga and Hussani (2015) found that both types of education expenditure positively influenced economic growth, recommending higher budgetary allocations for education. Naburgi, Abdul, and Mainoma (2019) emphasized the importance of recurrent expenditure on education in enhancing economic growth, while Aluthge, Jibir, and Abdu (2021) highlighted the significant positive impact of capital expenditure on economic growth, recommending a focus on meaningful capital projects.

3.0 Methodology

3.1 Model Specification

The model is this study is specified base on human capital theory and endogenous growth theory which argued that growth in the economy is a function of education and training in specific areas.

$$RGDP_t = GXE_t \quad \text{---------- 1}$$

Where
RGDP = Real Gross Domestic Product (proxy for economic growth).
GXE = Government expenditure on education

The principal preposition of the endogenous growth model is that growth is endogenous in the sense that it is determined by the values of the parameters of the system rather than being given by external factors such as the rate of scientific progress. Therefore, for high labour productivity, an integral part of technological progress is investment in human capital and this is termed endogenous factor because accumulation of physical capital is enhanced by the knowledge, skills and attitudes of the people who partake in such exercise and human capital is human capital formation is accounted for by expenditure on education and health. Base on this argument, this study adopted and modified the model by Uwatt, (2002), Althge *et al* (2021) and Chima and Yusuf (2023) as follows;

$$RGDP = f(GFCF, LAB, GXE, GXH, TBL, HCE) \text{ ---------- } 2$$

Where GDP = Real Gross Domestic Product (proxy for economic growth).
GFCF = Gross Fixed Capital Formation
LAP = Labour productivity
GXE = Government Expenditure on education
GXH = Government Expenditure on Health
TBL = Trade Balance (as an additional variable to include the external sector).
HCE= Household Consumption Expenditure

Stochastically, the model is rewritten as;

$$RGDP_t = \beta_0 + \beta_1 GXE_t + \beta_2 GFCF_t + \beta_3 LAP_t + \beta_4 TBL_t + \beta_5 HCE_t + \xi_t \text{ -- } 3$$

Where β_0 - β_5 are coefficients and ξ_t is the error term.

It has become a custom to manage data in a manner that reliable results may be obtained from the use of that data and hence the need for data transformation. This is due to the fact that, the magnitude of the data set may differ widely and hence the need to harmonize same. To achieve this, this study took the natural logs of both the regressand and regressors. Thus equation (3) becomes;

$$LnRGDP_t = \beta_0 + \beta_1 LnGXE_t + \beta_2 LnGFCF_t + \beta_3 LnLAP_t + \beta_4 LnTBL_t + \beta_5 LnHCE_t + \xi_t \text{ ---- } 4$$

Thus, the generic form of ARDL model $(p, q_1, \ldots, q_k)$ is specified as:

$$y_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \psi_i y_{t-i} + \sum_{j=1}^{k} \sum_{l_j=0}^{q_i} \beta_{j,l_j} x_{j,t-l_j} + \varepsilon_t \text{ ----- } 5$$

Where ε_t stand for innovations, α_0 is a constant, and α_1, ψ_i and β_{j,l_j} are coefficients of respective linear trend with lags of y_t, while lags of k regressors $x_{j,t}$ are such that $j = 1, \ldots, k$. Following the general specification to the equation (4.5), it can be stated as:

$$LnRGDP_t = \alpha_0 + \alpha_{1t} + \sum_{i=1}^{p} \beta_1 LnRGDP_{t-i} + \beta_2 LnGXE_t + \beta_3 LnGFCF_t + \beta_4 LnLAP_t + \beta_5 LnTBL_t + \beta_6 LnHCE_t \text{ ------ } \mathbf{6}$$
$$+ \sum_{j=1}^{k} \lambda_{1,j} \Delta GXE_{t-j} + \sum_{j=1}^{k} \lambda_{2,j} \Delta GFCF_{t-j} + \sum_{j=1}^{k} \lambda_{3,j} \Delta LAP_{t-j} + \sum_{j=1}^{k} \lambda_{4,j} \Delta TBL_{t-j} + \sum_{j=1}^{k} \lambda_{5,j} \Delta HCE_{t-j} + \xi_t$$

Furthermore, given that, the study seeks to estimate the relationship between regressand y_t on both its lags just as the contemporaneous and lag values of k regressors $x_{j,t}$. Equation 4.6 can be stated as:

$$y_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \psi_i y_{t-i} + \sum_{j=1}^{k} \beta_j (1) x_{j,t} + \sum_{j=1}^{k} \beta_j (L) \Delta x_{j,t} + \varepsilon_t \quad \text{---- -- 7}$$

Where $\Delta = (1-L)$ is used to denote the first difference. Since the above equation (6) does not clearly solve for y_t, it is simply a regression of intertemporal dynamics. Thus, the ideal regression setting of the above model that uses theoretical coefficients is specified as:

$$LnRGDP_t = \alpha_0 + \alpha_{1t} + \sum_{i=1}^{p} \beta_1 LnRGDP_{t-i} + \beta_2 LnGXE_t + \beta_3 LnGFCF_t + \beta_4 LnLAP_t + \beta_5 LnTBL_t + \beta_6 LnHCE_t$$
$$+ \sum_{j=1}^{k} \lambda_{1,j} \Delta GXE_{t-j} + \sum_{j=1}^{k} \lambda_{2,j} \Delta GFCF_{t-j} + \sum_{j=1}^{k} \lambda_{3,j} \Delta LAP_{t-j} + \sum_{j=1}^{k} \lambda_{4,j} \Delta TBL_{t-j} + \sum_{j=1}^{k} \lambda_{5,j} \Delta HCE_{t-j} + \xi_t$$

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Equally, "the conditional error correction form and the Bounds Test" is usually expressed as:

$$\Delta y_t = \alpha_0 + \alpha_1 t - \psi(1) EC_{t-1} + \left(\psi^*(L) \Delta y_{t-1} + \sum_{j=1}^{k} \beta_j (L) \Delta x_{j,t-1} \right) \quad \text{---..--- 9}$$

From equation (8), the error correction term, is denoted by EC_t and it also serve the purpose of a cointegrating relationship where y_t and $x_{1,t}, \ldots, x_{k,t}$ do not drift apart with the passage of time. Given that the there is no trend from cross examination, the study assumes no trend and restricts the constant inside the co-integrating equation, thus, specifies and estimates restricted constant with no trend. The model with restricted constant and no trend specification can be specified as:

$$\Delta y_t = \alpha_0 + b_0 y_{t-1} + \sum_{j=1}^{k} b_j x_{j,t-1} + \sum_{i=1}^{p-1} c_{0,i} \Delta y_{t-i} + \sum_{j=1}^{k} \sum_{l_j=1}^{q_j-1} c_{j,l_j} \Delta x_{j,t-l_j} + \sum_{j=1}^{k} d_j \Delta x_{j,t} + \varepsilon_t \quad \text{---10}$$

And

$$EC_t = y_t - \sum_{j=1}^{k} \frac{b_j}{b_0} x_{j,t} - \frac{a_0}{b_0} \quad \text{---------- 11}$$

With $H_0 : b_0 = b_j = \alpha_0 = 0, \forall_j$

Where is a vector and the variables in x_t are allowed to be purely I(0) or I(1); α is a Constant b, c and d are coefficients $j = 1, \ldots, k$; p, q are optimal lag orders and ε_t is a vector of the error terms. Thus, the error correction model can be specified as:

$$\Delta RGDP = \sum_{i=1}^{p} \beta_1 \Delta RGDP_{t-i} + \sum_{i=1}^{q} \beta_2 \Delta GXE_t + \sum_{i=1}^{q} \beta_3 \Delta GFCF_t + \quad \text{------ 12}$$
$$\sum_{i=1}^{q} \beta_4 \Delta LAP_t + \sum_{i=1}^{q} \beta_5 \Delta TBL_t + \sum_{i=1}^{q} \beta_6 \Delta HCE_t + \lambda EC_{t-1}$$

3.2 Kinds and Sources of Data

This study is a time series study and it relies essentially on secondary data that will be generated namely from The Global Economy sit, World Bank Statistics Bulletin, Central Bank of Nigeria (CBN) annual publications, and Macrotrends Site. The data are gross fixed capital formation, labour productivity, government expenditure on education, government expenditure on health, trade balance (as an additional variable to include the external sector) and household consumption expenditure

3.3 Method of Data Analysis

The study utilized Autoregressive Distributed Lag (ARDL) technique to examine the long-run and short-run relationships between variables in a time series framework. The ARDL model as proposed by Pesaran, Shiny and Smith (2001). The adoption of the ARDL approach for this study lies on the advantages inherent in it. First, irrespective of whether the underlying variables are I(0), I(1) or a combination of both. In such a situation, the application of ARDL approach to cointegration was to be realistic and efficient estimates. The endogeneity problem, which arises when explanatory variables are correlated with the error term in the regression model, is less problematic with ARDL technique since it is devoid of residual correlation because each of the underlying variables stands a stand-alone equation (i.e all variables are assumed endogenous). Second, the ARDL technique can distinguished between dependent and explanatory variables when there is a single long-run connection. In other words, the ARDL technique presupposes that the dependent variables and the exogenous variables have only one reduced form equation relationship (Pesaran, Smith and Shin 2001). Thirdly where there are several cointegrating vectors, this approach's main benefit is its ability to identify the cointegrating vectors. The Error Correction Model (ECM) which blends short-run correction with the long-run equilibrium without sacrificing long-run information, can finally be derived from the ARDL model, the associated ECM model has a sufficient number of lags to capture the data generation process generally to particular modeling frameworks.

4.0 Results

4.1 Unit Root Test Results

In order to ascertain that the variables used in the study had desirable econometric properties, the Augmented Dickey Fuller (ADF) was carried out and the result is presented in table 1.

Table 1: The results of the unit root test

Table 5.2a Augmented Dickey-Fuller Unit Root Test Results

Variables	At level	Prob. Value	First Difference	Critical Values			Prob. Values	Order of Co-integration
				1%	5%	10%		
RGDP	-1.227493	0.6514	-6.685617	-3.639407	-2.951125	-2.614300	0.0000	I(1)
HCE	3.682549	1.0000	-3.735528	-3.632900	-2.948404	-2.612874	0.0077	I(1)
GFCF	-1.362127	0.5897	-4.610746	-3.632900	-2.948404	-2.612874	0.0007	I(1)
GXE	-1.772959	0.3872	-7.812130	-3.632900	-2.948404	-2.612874	0.0000	I(1)
GXH	-2.486468	0.1273	-10.78795	-3.632900	-2.948404	-2.612874	0.0000	I(1)
LAP	-3.476746	0.0147		-3.632900	-2.948404	-2.612874		I(0)
TBL	-2.747537	0.0781	-4.456930	-3.752946	-2.998064	-2.638752	0.0020	I(1)

Source: Extract from E-views 10 output

From the results in Table 1, all the variables were found to be stationary at 1st difference except Labour Productivity which was found to be stationary at levels.

4.2 Optimal Lag selection

To analyze the impact of education expenditure on economic growth in Nigeria, the optimal lag selection criteria were estimated and the results presented in table 2.

Table 2: Optimal Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-64.21841	NA	2.51e-06	4.130494	4.399852	4.222353
1	146.2359	334.2509*	9.07e-11*	-6.131523	-4.246019*	-5.488512*
2	172.9892	33.04823	1.93e-10	-5.587601	-2.085951	-4.393438
3	228.9055	49.33790	1.11e-10	-6.759148*	-1.641351	-5.013832

* indicates lag order selected by the criterion

Source: Author's Computation Using E-views 10

The results of sequential modified LR test statistic, Final Prediction Error, Schwarz information criterion and Hannan-Quinn information criterion showed that Lag 1 is the optimal lag length for the study, while, the result of Akaike Information Criterion showed that lag 3 is the optimal lag length. However, Lag 1 was selected as the optimal lag length for this study this is due to the fact that for impact analysis Schwarz information criterion is most appropriate.

4.3 Result of the Bound Test

Based on the result of the optimal lag length, the bound test was estimated to ascertain whether there exist a long-run relationship between education expenditure and economic growth in Nigeria and the results are presented in Table 3.

Table 3: ARDL Bounds Test Result

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.686966	10%	3.03	4.06
K	4	5%	3.47	4.57
		2.5%	3.89	5.07
		1%	4.4	5.72

Source: Author's Computation Using E-views 10

The results of the bounds cointegration test presented in table 3 show that the F-statistic value of 5.69 is greater than the upper bound critical value of 4.57 at the 5% level of significance. Therefore, the null hypothesis of no long-run relationship between education expenditure and economic growth in Nigeria was rejected, implying that there existed a long-run relationship between education expenditure and economic growth in Nigeria at the 5% level of significance.

4.4 Short Run Impact of Educational Expenditure on Economics Growth.

Given the existence of a long-run relationship, the short-run and long-run estimates were computed and the results are presented in the Table 4.

Table 4: Short-run Estimate of ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-47.34748	8.247103	-5.741105	0.0000
@TREND	0.001213	0.006001	0.202143	0.8414
D(GXE)	-0.044307	0.120127	-0.368836	0.7154
D(GFCF)	0.094464	0.297530	0.317495	0.7535
D(LAP)	1.204309	0.382873	3.145455	0.0042
D(HCE)	4.167890	6.869554	0.606719	0.5495
ECM(-1)*	-1.087759	0.189399	-5.743205	0.0000

R-squared	0.537768
Adjusted R-squared	0.442133
F-statistic	5.623168
Prob(F-statistic)	0.000571

Source: Author's Computation Using E-views 10

Table 5.7 shows the short-run estimates of the relationship between education expenditure and economic growth in Nigeria. It can be observed that, government expenditure was negatively related to economic growth which is contrary to expectations. The relationship was also not statistically significant. The negative relationship implies that a unit increase in government expenditure on education will result to a 0.04% reduction in economic growth in the short-run and vice versa. The result also shows that the coefficient of gross fixed capital formation is positive and correctly signed implying that gross fixed capital formation had a positive effect on economic growth in Nigeria. Thus a unit increase in gross fixed capital formation will result to 0.09% increase in economic growth in the short-run. However, this effect is statistically not significant. Also, the result shows that as expected, labour productivity had a positive impact on economic growth in the short-run. This implies that a unit change in labour productivity had a 1.20% positive impact on economic growth in Nigeria. Furthermore, this effect is statistically significant at the 5% level. It is also clear from the results that household consumption expenditure had a positive impact on economic growth in Nigeria. This result conforms to apriori expectations but is statistically not significant at 5% level of significance. The result implies that a one percentage increase in household consumption expenditure will lead to 4.16% increase in economic growth in Nigeria.

At -1.087759 the ECM term is correctly signed and statistically significant at 5% level. This implies that any perturbation in the series in the short-run equilibrium will be re-established in the long-run. The speed of adjustment is however slow. The adjusted R-Squared of 0.44 means that 44% of the variation in economic in Nigeria is explained by the variables included in the model. Also, the F-Statistics value of 5.62 and its probability value of 0.000571 which is statistically significant at the 5% level of significance, suggest a strong joint impact of the variables on economic growth in the short-run.

4.5 Short Run Impact of Educational Expenditure on Economics Growth.

The long-run estimate of the model is presented in Table 5.

Table 5: Long Run Estimates of education expenditure on economic growth (ARDL)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GXE	-0.062729	0.223524	-0.280638	0.7813
GFCF	0.052147	0.210498	0.247732	0.8064
LAP	0.472855	0.330078	1.432556	0.1644
HCE	3.810329	5.116380	0.744732	0.4634

Source: Author's computation using E-views 10

The long-run results of the model showed that government expenditure on education had negative and statistically not significant impact on economic growth in Nigeria at the 5% level of significance, implying that a 1% increase in government expenditure on education will reduce in economic growth by 0.06%. Also, it is evident from Table 5 that gross fixed capital formation had a positive but statistically insignificant impact on economic growth in the long-run. This indicates that 1% increase in gross fixed capital formation would lead to 0.05% increase in economic growth in Nigeria. Again, labour productivity had positive but statistically insignificance impact on economic growth at 5% level of significance, in in the long-run. This means that, 1% increase in labour productivity increased economic growth by 0.47% in the long-run. In a similar way, the long-run estimates indicated that household consumption expenditure has a positive but statistically insignificant impact on economic growth. This means that, 1% increase in house hold consumption expenditure would increase economic growth by 3.81%.

4.6 Diagnostic Tests for Education Expenditure and Economic Growth in Nigeria

In order to validate the performance of the model, stability test (Ramsey RESET Test) for model Mis-Specification, Breusch-Godfrey LM test for autocorrelation, and Breusch-Pagan-Godfrey heteroscedasticity test were performed and results are presented in Table 6.

Table 6: Diagnostic Tests (ARDL)

Tests	Statistics	Probability values
Ramsey RESET test (F-statistic)	0.000683	0.9794
Autocorrelation (Breusch-Godfrey LM test)	0.918081	0.4140
Heteroskedasticity (Breusch-Pagan-Godfrey)	0.669555	0.7406
Normality Test (Jarque-Bera)	390.7432	0.00000

Source: Author's computation using Eviews 10

The results in table show that the model did not suffer from model mis-specification problems, autocorrelation and heteroskedasticity problems. However, it had normality problem. The result of Ramsey RESET test showed that, the model is stable. The model is therefore valid for policy formulation and implementation.

Furthermore, the stability of the estimates was tested using the CUSUM and CUSUM of Squares plots as shown in figure 1 and 2.

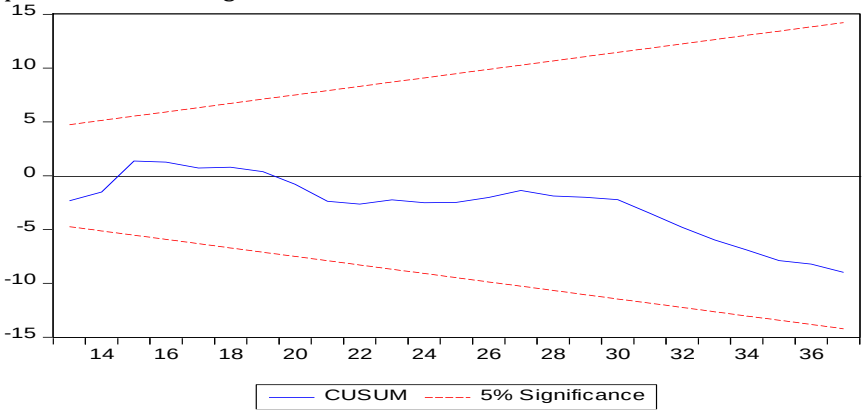

Figure 1: CUSUM Plots of the Estimates

The CUSUM plot showed that the estimates were stable in the long-run since the CUSUM line lies within the bounds of the 5% significance level. This suggests no change in the behaviour of the variables in the overtime. The implication is the parameters in the model did not suffer from any structural instability over the period under study. That is, the entire coefficient in the error correction model is stable.

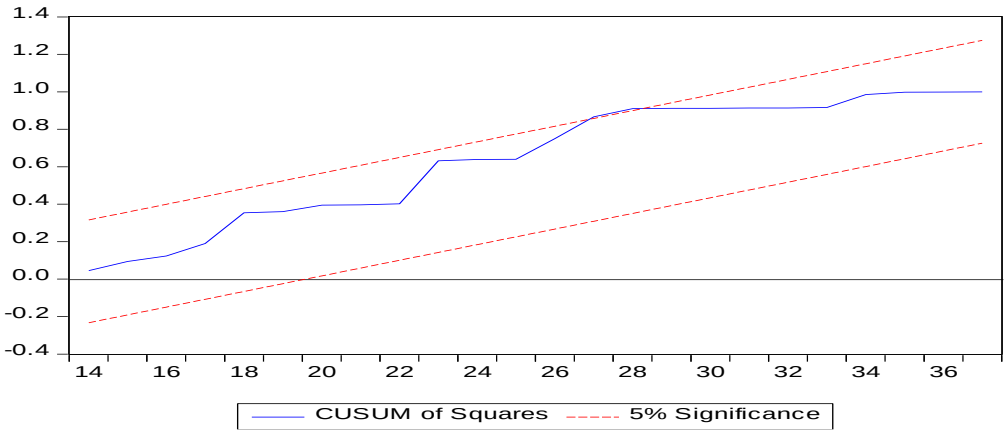

Figure 2: CUSUMQ of Square Plots

Figure 5.2 also showed that the plot of CUSUM of Squares plot for the domestic investment model is within the 5% critical bound. This implies that the parameter of the model did not suffer from any structural instability over the period under study. That is, the entire coefficient in the error correction model is stable

5.0 Conclusion and Recommendation

This paper was taken to examine the impact of educational expenditure on economic growth in Nigeria. The analysis of the short-run and long-run impacts of various economic variables on economic growth in Nigeria reveals significant insights. Government expenditure on education has a negative and statistically insignificant impact on economic growth in both the short and long run. Conversely, labour productivity shows a significant positive impact on economic growth in the short run, although this effect is not significant in the long run. Gross fixed capital formation and household consumption expenditure exhibit positive impacts on economic growth, but these effects are not statistically significant in either timeframe. In conclusion, government expenditure on education does not appear to be an effective tool for promoting economic growth in Nigeria in either the short or long-run.

Based on these findings, it is recommended that the Nigerian government reevaluate its educational expenditure to address potential inefficiencies or misallocations. Investing in educational programs that directly enhance skills and productivity could translate expenditure into economic growth. Additionally, policies should focus on improving workforce skills and productivity through training programs, vocational education, and continuous professional development, given the significant short-run impact of labour productivity. Investment in infrastructure should be continued or increased to create a conducive environment for economic activities, potentially leading to long-term benefits. To stimulate economic growth through household consumption, policies that increase disposable income and encourage consumer spending, such as tax incentives or subsidies, should be developed. Finally, improving data collection methods and utilizing advanced econometric techniques can ensure accurate tracking of economic indicators and the effectiveness of government spending, allowing for necessary adjustments to economic policies. By addressing these areas, Nigeria can

enhance the positive impacts of its economic variables on growth and foster a more robust economic environment.

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