



Assessment of the Influence of Government Education Expenditure and Economic Growth in Nigeria

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Abstract: Do government investments in education, including ongoing expenses and infrastructure development, affect Nigeria's economic growth? This study examines the relationship between the allocation of government funds towards education and the economic development of Nigeria during the period from 1980 to 2020. The study uses the Autoregressive Distributed Lagged (ARDL) and Error Correction Model (ECM) to analyze the impact of repeated government investment in education and capital on economic growth. The data acquired from the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS) demonstrates a clear correlation between the increase in the Gross Domestic Product (GDP) and the amount of money

invested in education. The results of the ARDL model suggest that government investment in education capital has a significant and lasting positive impact on economic growth. More precisely, a one percent increase in capital investment is associated with a 3.14 percent increase in economic growth.

The study's findings suggest that authorities in Nigeria should prioritise augmenting investment in education capital expenditure to foster long-term economic growth.

Keywords: Economic Growth, Education, Government Expenditure, Human Capital Development, Educational Financing

JEL Classification: I22, I25



I. INTRODUCTION

Societal and global advancement increasingly depend upon research, invention, innovations, and adaptation. For that critical reason, United Nations Sustainable Development Goal 4 focuses on Quality Education (Magaji, 2023). However, education is a public good in the Less Developed Countries (LDCs) and needs effective government involvement (Liu et al., 2021). Therefore, human capital (HK) and sectors that rely on information are increasingly recognised as the primary drivers of wealth generation (Keji, 2021). Economic growth and decline hinge on the population's quality, which plays a role in economic growth or decline (Kheng et al., 2017). Economists view investments in HK stocks, such as those in education, training, health care, and other areas, as investments (Becker, 1964). Earlier, Schultz (1961) noted that health and education should consider innate and learned skills.

[1]. Developing nations like Nigeria need help with economic growth. One of the measures proposed is human capital development (HKD), primarily through building the educational system (Okerekeoti, 2022). The level of HKD of a nation reflects the level of health, education, and other critical social amenities that affect the level of economic activities in that nation (Sun, 2021). The dual function of individuals as both recipients of economic progress and as crucial contributors to an economy is also of great importance (Le & Tran, 2021). Therefore, HKD is the productive investment that is embodied in human beings. These include the knowledge, skills, and health acquired through investment in formal education, on-the-job training, and medical care (Todaro & Smith, 2009).

[2]. The persistent problem of inadequate funding for education persists, even in the present day. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) has mandated that developing nations allocate at least 26 percent of their budget to the education sector to ensure stability in their educational systems (Odigwe & Owan, 2019).

[3]. The academics concur that the need for more funding allocation is one of the foremost obstacles confronting the education system in Nigeria. Contrary to the government's commitment to give 26% of its yearly budget to the education sector, this goal has yet to be met, as it has received less than 10% of the budget in recent years. This calls for concern, considering the significance of the industry for economic growth and development.

[4]. Apart from this introductory section, the paper is divided into four sections. Section two presents an examination of theories, a study of relevant literature, and establishing a theoretical framework. Section three outlines the methodology, including the sources of data, the technique of data collecting, and the method of data analysis. Section four centres on the discussion of the empirical results and the implications of the findings. The final section of the study presents conclusions derived from the analysis and discusses the policy implications.

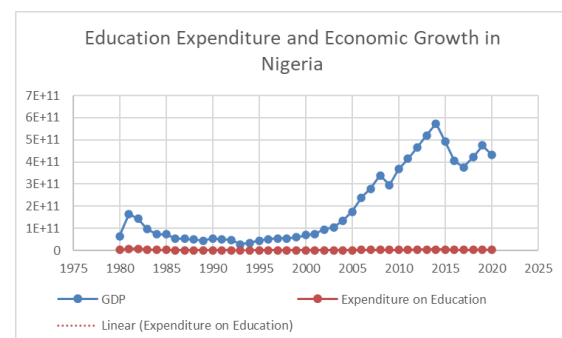


Figure 1. The trend of Education Expenditure and Economic Growth in Nigeria

Source: Research finding

The table and graph above demonstrate a clear positive association between economic growth, as measured by GDP (Gross Domestic Product), and education expenditure in Nigeria. Over time, there has been a discernible correlation between the growth of the country's GDP and an upward trajectory in expenditure on education. Although there may be variations, the general trend indicates that periods of economic expansion are frequently linked to heightened investment in the education sector. This association highlights the acknowledgment of education's significance in contributing to and reaping the benefits of the country's economic prosperity. Nevertheless, although the GDP has risen, the investment in education has also increased. However, it is essential to note that the expansion in education expenditure has not kept pace with the overall economic growth.

II. THEORIES AND REVIEW OF LITERATURE

The origin of the concept of human capital (HK) can be attributed to the classical school of thought in 1776. HK is identified by Schultz (1961) as a crucial factor that significantly impacts economic growth. By building upon previous



concepts, Becker (1964) formulated a scientific hypothesis establishing a connection between HK and economic growth. Bloom and Canning (2005) established a connection between HK and economic growth in their study. In contrast, Todaro and Smith (2003) defined a country's economic growth as a gradual increase in its ability to produce a broader range of economic commodities through technological advancements and institutions over an extended period. Romer (2008; 1987) argues that the long-term expansion of the economy relies on the continuous increase of HK. Economic growth refers to the progressive expansion of the number of products and services an economy generates over time (Adam et al., 2016). According to UNDP (2013), HK refers to the valuable labor, skill, and knowledge resources contributing to productivity. Several empirical works of literature have emerged to substantiate Berker's theory.

III. EMPIRICAL REVIEW

Several empirical studies investigate the correlation between health and education expenditures and economic variables. The study examined empirical studies that investigated the collective influence of education expenditures on economic variables in Nigeria and other countries, following its specific aims.

Obialor (2017) analyses the influence of public investment in Hong Kong on the economic expansion in Sub-Saharan Africa, utilising data from Ghana, South Africa, and Nigeria from 1980 to 2013. The study uses vector error correction (ECM) and cointegration methodologies to analyze the impact of HK on economic growth. The three nations' results demonstrate that only Nigeria has a statistically significant and beneficial impact on health (GIH) and education (GIE) growth. However, the effect of the literacy ratio (LR) on growth is only marginally positive across all three nations. The paper suggests prioritising skills enhancement, allocating more funds, and advocating for policies that enhance enrollment in secondary schools within the sub-region.

Anvari et al. (2019) analysed panel data from 2004 to 2016 to investigate the influence of government expenditure on health and education on the economic growth of Iran and OPEC countries. It is essential to analyze the oil revenue, overall government expenditure, and the allocation of funds toward healthcare, education, and economic growth to understand the situation comprehensively. Before 2011, Iran's healthcare expenditure followed a clear pattern, but the

percentage of government funds devoted to education continually decreased in the total budget. There is a robust and statistically significant association between the revenues generated from oil, the government's total expenditure, and government funds' educational allocation. Every country's development plans place economic growth as a primary objective, and member nations of OPEC need to comprehend the interdependencies between economic factors to achieve sustainable long-term development. Understanding this is crucial to creating effective policies and strategies for each unique situation.

Bechama et al. (2021) analyze the influence of human capital on Nigeria's economic growth by utilizing time series data from 1970. Using the ARDL method, the data analysis shows that a 1% increase in government spending on education results in a 0.45% rise in net GDP in the long term and a 0.08% increase in the short term. However, the data was collected when the Nigerian currency, the naira, had a substantial value before implementing the Structural Adjustment Programme (SAP). Despite SAP's profitability, no modifications were made to the currency exchange rate.

Keji (2021) investigates the relationship between human capital (HK) and economic growth in Nigeria from 1981 to 2017, with a specific emphasis on the education and health sectors. He employed the Johansen methodology and vector autoregressive models. According to his research, a rise in school attendance by a specific percentage is linked to a 0.044 rise in real GDP, whereas a decrease in government spending on education is linked to a 0.0396 decline in real GDP. However, this result could be altered if the data is updated to represent the year 2020 accurately.

The film "Sun" (2021) delves into the relationship between economic progress and education in China. He employed the PVAR modal, a theoretical model based on the Cobb-Douglas production function. He discovered that economic prosperity could facilitate the progress of education, contingent upon the particular geographical area. Furthermore, he discovered a mutually dependent relationship between economic progress and educational attainment. The panel data vector autoregressive model (PVAR) he used demonstrates that the swings in regional economic success may be attributed to the regions themselves, accounting for 50% of the variability.

According to a research titled "Empirical Analysis on Public Expenditure for Education and Economic Growth: Evidence from Indonesia" by



Suwandaru et al. (2021), 20% of Indonesia's state budget is allocated to education. The researchers applied the Cobb-Douglas Production function as an economic measurement approach and employed Autoregressive Distributed Lag models to establish the relationship between the variables. Their research indicates that increasing government spending on education by just 1% will have a minimal impact on economic growth, resulting in a short-term increase of 0.00029% and a long-term increase of 0.0011%.

Le and Tran (2021) conducted a study investigating the correlation between government spending on education and economic growth in Vietnam. The study employs data from the General Statistics Office of Vietnam spanning 2006 to 2019. The researchers employed a VAR model and conducted a Granger Causality analysis to establish the association. Their research reveals a mutual connection between economic growth and government spending on education, with a delay of around two years. According to their data, 63.7% of the variation in educational expenditure (EE) during ten years may be ascribed to the increase in GDP.

Trabelsi (2017) used a method of research called gross counting to investigate the correlation between investment in public education and economic growth. The results suggest that economic growth is positively influenced by investment in education, notably when the education system demonstrates excellent quality. Nevertheless, if the quality is insufficient, the impact becomes harmful. For example, Tunisia and Moldova dedicate substantial resources to education, with expenditure rates of 6.04% and 7.03%, respectively. Nevertheless, despite the substantial investment made, the quality of education in both countries remains significantly deficient, with scores of 380.5 and 399.4, respectively. Furthermore, the allocation of resources towards education does not have any noticeable impact on their economic expansion, as seen by growth rates of 2.48% and -1.08%, respectively.

Liu et al. (2021) employ the Cobb-Douglas Production Function model to examine the correlation between public education expenditure and economic growth in China. The expenditure effects are categorised into three distinct groups: primary, secondary, and tertiary education. The findings indicate that the presence of the public sector has a beneficial impact on economic growth, resulting in a significant increase of 8.84%. The tuition fee for higher education is 6.08%.

IV. THEORETICAL FRAMEWORK

Gary Becker's Human Capital Theory, initially introduced in his 1964 publication "HK: A Theoretical and Empirical Analysis," brought about a significant transformation in labor economics and offered a fresh outlook on the significance of education, training, and health in economic progress. This notion is fundamental in comprehending how investments in HK contribute to the well-being of both individuals and society.

The essential elements of Becker's HK Theory

Investing in HK: According to Becker's theory, education and training are considered investments in HK, like investments made in physical capital, such as machinery and equipment. People and communities commit resources to obtain knowledge and expertise in anticipation of future benefits.

Growth and Accumulation: HK is acquired gradually through education, training, and learning while working. As individuals accumulate more knowledge and skills, their HK expands, resulting in more production and income.

Becker's theory shows the link between education, increased income, and economic output. Higher levels of education are positively correlated with the potential for higher income and improved economic well-being.

HK significantly impacts an individual's labor market outcomes, such as income, employment prospects, and possibilities for professional growth. Education and skills are often regarded as valuable resources in the labor market.

Becker (1964) posits three fundamental presumptions that form the basis of HK theory. One key point is that labor skills can adjust and endure over time. Furthermore, it is essential to note that the present productivity level directly impacts future productivity and significantly determines current earnings. Furthermore, the correlation between educational achievement and individual income, along with these three factors, supports the claim that it is feasible to sacrifice current earnings, either whole or partially, to enhance future earning potential. Education, whether acquired through formal means or by practical experience, can be viewed as a form of capital investment. This investment is considered worthwhile if the total value of costs and returns, adjusted for time, reaches a value of one.

$$Y = f(X) + \mu$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \dots \beta_n X_n + \mu$$

Where:

Y = Economic Growth,



X_1 = Human Development Index,
 X_2 = Life Expectancy,
 X_3 = Expected Year of Schooling.
 μ = Error term

This model serves as the theoretical foundation for this study. These models suggest that an economy's growth is driven by its HK. This study is based on the theoretical underpinning of the generalization of HK production technology as growth determinants and the available channels of HK investment in emerging nations. The consensus on this topic is still contested in the literature.

The concept considers capital to encompass physical capital and the labour input's knowledge, skills, and experience. Growth is perceived because of the combined influence of HK and physical capital. The advancement of technology in the economy is directly responsible for the increase in output growth, which can be attributed to the enhanced accumulation of both physical and HK.

V. METHODOLOGY AND DATA

A. DATA

This analysis employed annual data covering the period from 1980 to 2020. The study used secondary data from the CBN Statistical Bulletin December 2021 and the NBS Annual Report 2021. The study incorporates variables on HK expenditures, specifically government education recurrent and capital expenditures. These variables are sourced from the CBN Statistical Bulletin of December 2021. Data on the economic growth rate was obtained from the NBS annual report for the year 2021.

B. METHODS OF DATA ANALYSIS

This study employed the ARDL and the ECM to determine the relationship and impact of government expenditures on education as HKD in Nigeria.

C. MODEL SPECIFICATION

The model for this study was adopted from Oluwatobi & Ogunrinola (2011). Theoretically, the model for this study is stated as follows: Gross domestic Product (GDP) depends on Government Education Expenditure (GEE), Life Expectancy (LE), and Total School enrollment rate (TSE).

Thus: $GDP = f(GEE, LE, TSE)$

(3.1)

D. AUTOREGRESSIVE DISTRIBUTED LAGGED (ARDL) MODEL

The adjustment of Equation 3.1 was conducted to conform to the research objectives and determine

the functional relationship between investments in HK and economic growth in Nigeria. The economic growth rate in Nigeria was proxied by the country's economic growth rate. In contrast, HK expenditures were proxied by government education recurrent expenditures, government health recurrent expenditures, government education capital expenditures, and government health capital expenditures. The functional relationship model is formulated as follows:

$$EGRN = f(GREEXP, GCEEXP) \quad (3.2)$$

Equation 3.2 represents a linear and functional connection between the dependent variable and independent variables, which is determined by the specific goals of the study. Equation (3.2) depicts the Economic Growth Rate in Nigeria as a mathematical expression that depends on the Government Education Recurrent and Government Education Capital Expenditure in Nigeria.

$$\begin{aligned} \Delta EGRN_t &= \beta_0 + \sum_{i=1}^d \beta_{1i} \Delta EGRN_{t-i} + \sum_{k=1}^f \beta_{2i} \Delta GREEXP_{t-i} \\ &+ \sum_{n=1}^h \beta_{3i} \Delta GCEEXP_{t-i} + \beta_{4i} EGRN_{t-i} \\ &+ \beta_{5i} GREEXP_{t-i} + \beta_{6i} GCEEXP_{t-i} \\ &+ \varepsilon_t \end{aligned} \quad (3.3)$$

Equation 3.3 is the ARDL model that represents the impact of GREEXP and GCEEXP on Nigeria's economic growth rate.

Where:

$EGRN_t$ = The Economic Growth Rate in Nigeria
 $GREEXP_t$ = The Government Recurrent Education Expenditures in Nigeria.

$GCEEXP_t$ = The Government Capital Education Expenditure in Nigeria

β_0 = The constant

while $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$, and β_6 . are model parameters.

E. ERROR CORRECTION MODEL (ECM)

The construction of the ECM commences with the fundamental framework of the ECM, which is expressed as:

$$\Delta Y = \alpha + \beta X + \beta \Delta X_{t-1} - \beta EC_{t-1} + \varepsilon_t \quad (3.4)$$

Where:

ΔY represents the output of Economic Growth, a substitute for Nigeria's Economic Growth Rate. The βX represents the endogenous variables, namely the GREEXP and the GCEEXP in Nigeria. The term $\beta \Delta X_{t-1}$ represents the lag or delay of the variables by one period. The formulation of the ECM starts with the use of Ordinary Least Squares



(OLS). The formulation of OLS for multiple models is as follows:

$$EGRN_t = \beta_0 + \beta_1 GREEXP_t + \beta_2 GCEEXP_t + \mu_t \quad (3.5)$$

Equation (3.5) represents the GREEXP and GCEEXP Models. Thus, from equation (3.5), the ECM that was used for estimation and analysis is formulated as follows:

$$\begin{aligned} \Delta EGRN_t &= \beta_0 + \sum_{g=1}^m \beta_{1i} EGRN_{t-1} + \sum_{i=1}^o \beta_{2i} \Delta GREEXP_{t-1} \\ &+ \sum_{j=1}^p \beta_{3i} \Delta GCEEXP_{t-1} + \beta ECM_{t-1} \\ &+ \varepsilon_t \end{aligned} \quad (3.6)$$

Source: Research finding

Table 1 shows the descriptive statistics of the variables employed in the symmetric and asymmetric models. SD is the standard deviation which can be used to measure the relative spread of the variables. It can be deduced from the variables that the GREEXP is more volatile, followed by the GCEEXP and EGRN. The average values of all the variables are positive. At the same time, the GREEXP has the maximum value, followed by the GCEEXP and EGRN, which shows the trend of HK expenditure in Nigeria throughout the study. Similarly, the table shows that only GCEEXP has a platykurtic distribution, as indicated by its kurtosis value being less than three (3). The remaining variables have mesokurtic distributions, with more than three kurtosis values (3). The Jarque-Bera test indicates that the variables GREEXP and GCEEXP do not follow a normal distribution, although the variable EGRN does follow a normal distribution. However, the use of a large sample size eliminates

The estimation was refined using a model with a coefficient of 3.6 until the error-correcting mechanism (ECM) reached a negative value. The presence of a negative coefficient (-1) in the error correction term ECM indicates the equation's statistical importance, which is determined by its corresponding t-value and probability value. Equation (11) of the ECM model illustrates the influence of GREEXP and GCEEXP on Nigeria's economic growth pace.

VI. EMPIRICAL FINDINGS

Table 1: Descriptive Statistics

| | Mean | Max. | Min. | SD. | Skewness | Kurtosis | JB | Obs. |
|--------|--------|--------|--------|--------|----------|----------|--------|------|
| EGRN | 4.2575 | 15.330 | -2.04 | 3.7386 | 0.4508 | 3.4991 | 1.8146 | 41 |
| GREEXP | 131.61 | 593.44 | 0.1200 | 175.82 | 1.2680 | 3.4116 | 11.277 | 41 |
| GCEEXP | 31.190 | 117.98 | 0.0600 | 34.807 | 0.8043 | 2.3569 | 5.1275 | 41 |

any obstacle regarding the normality of the data, thanks to the law of big sample size. As a result, the parameter estimates derived from the data will gradually approach their actual values.

Table 2: Data Pairwise Correlations

| Variables | EGRN | GREEXP | GCEEXP |
|---------------|----------|----------|----------|
| EGRN | 1.000000 | | |
| GREEXP | 0.557048 | 1.000000 | |
| GCEEXP | 0.454079 | 0.978985 | 1.000000 |

Source: Research finding

The pairwise correlation coefficients between the variables are shown in Table 2. All the variables have a pairwise positive correlation, as seen in the table. The result revealed a relatively strong positive correlation between the economic growth rate and GCEEXP and GREEXP. However, strong positive relationships are established between GCEEXP and GREEXP.

Table 3: Unit Root Test Results

| Variable | Test | Level | | Difference | | Remark |
|----------|------|-----------|-----------|------------|-----------|--------|
| | | C | c & t | C | c & t | |
| EGRN | ADF | -2.101 | -2.034 | -11.32*** | -11.20*** | I (1) |
| | PP | -4.109*** | -4.050*** | -14.52*** | -14.90*** | I (0) |
| LGREEXP | ADF | -2.054 | -3.029 | -5.268*** | -5.875*** | I (1) |
| | PP | -1.469 | -2.955 | -10.86*** | -13.99*** | I (1) |
| LGCEEXP | ADF | -1.082 | -0.727 | -9.497*** | -9.514*** | I (1) |
| | PP | -1.245 | -1.600 | -9.514*** | -8.462*** | I (1) |

Source: Research finding



*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 3 shows the results of ADF and Phillips-Perron Unit Root Tests for economic growth rate, government capital education spending, and GREEXP. All variables follow a first-order integrated process except for EGRN, which exhibits stationary characteristics. An ARDL methodology addresses spuriousity due to its adaptability and ability to incorporate specific variables. ARDL is applicable when all variables are stationary, integrated into order one, or have mixed orders. However, modifying variables for stationarity is necessary.

4. ARDL Lag Selection

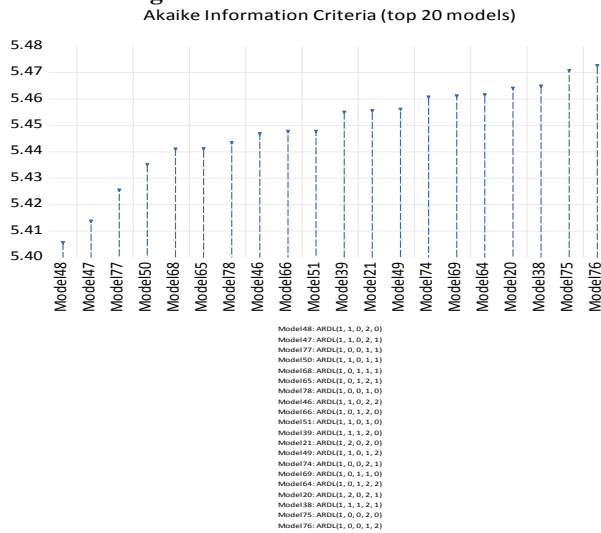


Figure 1: Lag Selection Criteria

Source: Research finding

Like the unit root test mentioned in point 3, the selection of lags is of utmost importance as it directly influences the model's outcomes. Various techniques can be employed to determine each variable's most favourable time delay. Nevertheless, in the ARDL framework, the SIC criterion offers more accurate estimations than the AIC criterion with limited sample sizes (Pesaran & Shin, 1999). The AIC criterion tends to overestimate the optimal number of lags to include. This is not desirable in small samples because increasing the lag reduces the number of

observations available. However, based on our observation, it is evident that we are working with a large sample size since our number of observations exceeds 30. Therefore, to create a consistent model using our sample size, the lag duration for the ARDL model is determined by the AIC criterion.

The AIC information criteria, as shown in Figure 1, indicate that the most suitable lag for our ARDL model is (1, 1, 0, 2, 0). Nevertheless, according to Pesaran et al. (2001), ensuring the absence of serial correlation, heteroskedasticity, misspecification, and non-normality is essential. Therefore, the lag duration can be modified to account for any biases and accurately capture the impact of the explanatory variables on the target variable.

4.2 ARDL - Bounds Test for Cointegration Analysis

The F-Bounds test assesses whether the variables exhibit a long-term relationship. The test entails calculating the ARDL equation and examining whether the coefficients for the lagged variables of one period, denoted as $\eta_{j,j} = 0, 1, 2, \dots, p$, are collectively equal to zero. Therefore, the subsequent hypothesis test is conducted:

$H_0: \eta_j = 0 \forall j$: A Long-run relationship does not exist.

$H_1: \eta_j p = 0$ for some j : A Long-run relationships exist.

A hypothesis test is undertaken for each long-run coefficient to assess the significance of the association with the indicators. Following prior studies, the null hypothesis is either rejected or not rejected based on the critical values, as employed in Pesaran et al. (2001). If the F-statistic exceeds the critical levels, we infer the existence of a long-term link between the variables. If the value decreases below a certain threshold, we dismiss the concept of a sustained correlation. If the value falls within a range, we consider the outcome inconclusive by employing the F-bounds test. Thus, to obtain additional verification, we might utilise the t-ratio.

Table 5: ARDL F-Bounds Test for Cointegration Analysis

| | | |
|-----------------------|--------------------|--|
| F = 5.053860 | K= 4 | Null-Hypothesis: No long-run relationships exist. |
| Critical Value | Lower Bound | Upper Bound |



| | | |
|-----|------|------|
| 1% | 3.29 | 4.37 |
| 5% | 2.59 | 3.49 |
| 10% | 2.2 | 3.09 |

Source: Research finding

The F-statistic estimated in Table 4 is 5.05, which is significant at the 0.01 level. The upper bound value for this statistic is 4.37. According to Pesaran et al. (2001), the F-test exceeds the threshold values at the 1%, 5%, and 10% significance levels. The

result, therefore, rejects the null hypothesis of no long-term association among the variables being studied. This development also confirms the accuracy of this study's estimated ARDL long-run model.

4.3 ARDL Long-run and Short-run Estimated Model

Table 6: ARDL Long-run and Short-run Estimated Result

| Regressors | Coeff. | Std. Err. | T-Stat. | Prob. |
|---------------------------|--------------|-----------|-----------|----------|
| Long-run | | | | |
| $EGRN_{t-1}$ | 0.229279 | 0.170714 | 1.343058 | 0.1893 |
| $LGREEXP_t$ | 2.390456 | 1.854893 | 1.288729 | 0.2073 |
| $LGCEEXP_t$ | 3.148877 | 1.269434 | 2.480535 | 0.0190** |
| Constant | -0.939760 | 2.148769 | -0.437348 | 0.6650 |
| R^2 | 0.42 | | | |
| F – stat. | 2.70(0.02) | | | |
| Serial Cor. χ^2_{LM} | 2.00(0.15) | | | |
| Heteo. χ^2_{ARCH} | 0.35(0.93) | | | |
| Normality | 20.79(0.0)* | | | |
| Ecm_{t-1} | -0.770721 | | t-Stat | |
| | (0.0000) *** | | 5.947858 | |

Source: Research finding

***P<0.01; **P<0.05; *P<0.1

The ARDL result is presented in Table 5. The panels exhibit the results for the dependent variable, Economic growth, in both the long-term and short-term. Based on the statistics presented in Table 5, the government's allocation of funds towards education, including regular expenditures and investments, positively impacted the economy's long-term growth. Nevertheless, it is only the government's investment in education that has a significant effect on economic growth. Therefore, an increase in GCEEXP in the current year will lead to a proportional 3.14 percent expansion of the economy in the following years. However, the association could not be proven in the short term since the effects of recurrent and capital education expenditure vanished in the short term. This occurred because both variables were included in the model with a zero (0) lag. The error correction terms ($Ecm_{(t-1)}$) indicate that the estimated models have successfully converged, and the rate at which price disequilibrium is corrected falls within the range of 77% per year. Consistent with

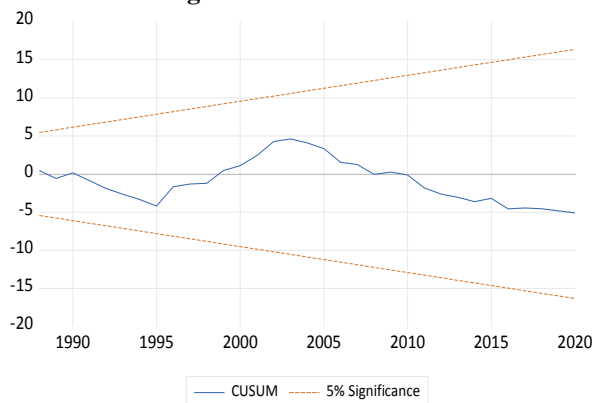
expectations, the result is negative and highly significant, as indicated by a T-value of 5.947858. Furthermore, the model's fitness is assessed using the coefficient of determination and its adjusted version, as shown in Table 5. Additionally, the overall significance of the model is evaluated using the F-statistics. The coefficient of determination (R^2), which is 0.419165, indicates that the explanatory factors account for 42% of the variation in the target variable. The revised R^2 value (0.264276) indicates that the independent variable accounts for 26% of the variation in the target variable, considering the degrees of freedom. The F-statistic value, 2.706228 (0.022667), indicates that the model is highly significant at a 5% level of significance, as the probability of the F-statistic is less than 0.05. Additionally, it implies that the model is suitable for making predictions. The results undergo multiple econometric diagnostic tests before utilising the model estimates for economic analysis. Greene (2008) and Gujarati and Sangeetha (2007) incorporate tests for



heteroscedasticity, serial correlation, normality, and stability. The econometric approaches employed were the Breusch-Pagan-Godfrey test, the Breusch-Godfrey Serial Correlation LM test, the Jarque-Bera test, the Specification test (Ramsey Reset Test), and the Cusum and Cusum square tests. The residuals of the model do not follow a normal distribution. Nevertheless, the computed diagnostic indicators indicate that they are not considerably influenced by serial correlation, unaffected by heteroscedasticity issues, highly vulnerable to multicollinearity, and correctly characterised without misspecification. The appealing nature of OLS models stems from these qualities. Our model exhibits all the desirable qualities of Ordinary Least Squares (OLS), making it highly reliable for economic research and forecasting.

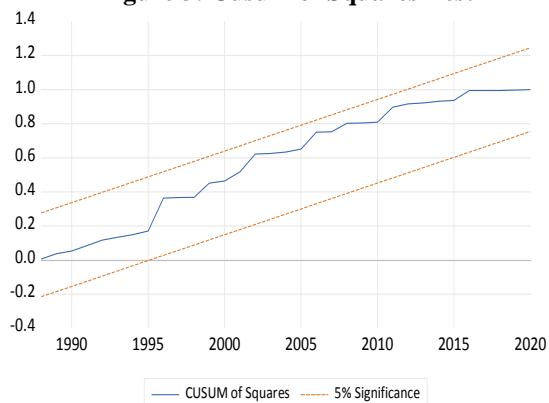
Figures 2 and 3 depict the results of the stability test using the Cusum and Cusum square tests, which provide additional evidence of the model's stability. The estimates remained consistent throughout the duration since the residual plots did not exceed the 5% significance boundaries.

Figure 2: Cusum Test



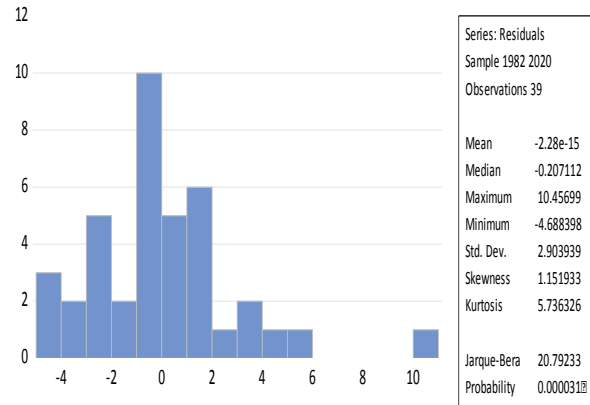
Source: Research finding

Figure 3: Cusum of Squares Test



Source: Research finding

Figure 4: Normality Test



Source: Research finding

VII. IMPLICATION OF FINDINGS

The research indicates that the government's recurring investment in education has little effect on economic growth in the short and long term. On the other hand, the long-term effect is beneficial but lacks statistical significance in explaining the variability in economic growth. The findings are supported by that of (Aluthge et al. (2021) and contradict the study by Obi and Obi (2014). This means that even though government expenditure is increasing, the expenditure is only significant in the short run and does not contribute to the future. This is widely unacceptable as the outcomes negate the Sustainable Development Goals (SDGs) and the national development plan related to educational aspirations in the country. Ultimately, the study concluded that allocating government funds toward education infrastructure has minimal impact on immediate economic expansion. Concurrently, the application of symmetric analysis has a positive and significant impact on sustained economic growth over a prolonged period.

On the other hand, a long-term and significant impact is recognised as time passes. We can definitively refute the null hypothesis that government investment in education capital has no significant effect on economic growth. Concurrently, we recognize the alternative hypothesis that the variable significantly impacts Nigeria's economic growth throughout the study. Hence, the correlation between educational expenditure and economic growth in Nigeria is contingent upon the level of investment in other expenditure categories.



This is because educational spending during the research period was influenced by external variables such as policy inconsistencies, insufficient funding, and misallocation of funds.

VIII. CONCLUSION AND RECOMMENDATIONS

The study posits that government education expenditures influence Nigeria's economic growth. While the ultimate outcomes are positive, the immediate impacts are insignificant. Government funding in education is an essential determinant in fostering economic expansion. An increase in the proportion of funds allocated to education results in a substantial enhancement of economic growth in the following years. However, the report highlighted the persistent issue of inadequate financial resources dedicated to education, emphasising the significance of consistent investment in advancing HK to achieve sustainable economic expansion. The research proposes that the government address the persistent issue of inadequate funding for education by striving to achieve or exceed the United Nations' recommended allocation of at least 26 percent of the budget for the education sector, with a specific emphasis on capital expenditures. This will facilitate the advancement of sustained economic expansion.

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