EDUCATION GROWTH IN NIGERIA: DOES FORGONE EXPENDITURE ON EDUCATION MATTER?

IHUGBA, OKEZIE. A
+2348035501438/okezieihugba@gmail.com
OBIUKWU, SANDRALYN I.
+2348060148200/sandyify@gmail.com
AKOBUNDU, PRECIOUS
+2348037425538/akobundupreciou s0@gmail.com
OKORO, DANIEL C.
+2348036771055/danidany2020@yahoo.com
OYELADE, OLANYINKA
08148841850/oyeladeo230@gmail.com
Department of Economics, Alvan Ikoku Federal College of Education, Owerri, Imo State.

ABSTRACT
This paper investigated the education sector's budget shortfall based on UNESCO's recommendation of a 15–25% budgetary allocation to the education sector for developing countries (forgone expenditure) and its effect on education growth in Nigeria using annual data from 1981 to 2019. This paper used Vector Error Correction Mechanism (VECM), impulse response, and variance decomposition simulations to explain the response to shock amongst the variables. In addition, the study used the VECM Granger causality approach to understand short-run causation among variables through F-/Wald test simulation. Later, the aforementioned simultaneous system equation is evaluated using ordinary least squares (OLS). In its three lags, empirical results show that forgone education spending has a positive and substantial association with education growth, whereas real education expenditure has a negative relationship with education growth. The VECM Granger causality result also shows that forgone education expenditure causes education growth. A closer examination of the impulse response function reveals that foregone education expenditure will contribute to educational growth in the short and long run. Based on the findings, the government should boost its share of education spending to achieve the UNESCO recommendation of 15–20%. Furthermore, government education spending should be properly managed in order to improve educational growth.

Keywords: UNESCO; Government Expenditure and Education; Growth; VECM.
JEL CODES; F13, H52, Q4, B23

1 INTRODUCTION
Education is the foundation upon which advanced societies are built. This industry is distinct from others in the economy, such as health care, agriculture, manufacturing, communication, transportation, defense, finance, and banking. Schooling produces professionals in a variety of economic sectors. If an economy is struggling, look at how much money is spent on education, according to Ola (1998). As a result, one would expect the government to invest heavily in this industry that is laying the golden egg in order to meet its challenges and needs. Individuals who begin with a solid foundational education will always fare better. They outperform in secondary school and in life. Individuals, societies, and governments all benefit from investing in education.

According to the United Nations International Children's Emergency Fund (2019), Nigeria has the world's highest number of school-age children, with 10.5 million children not receiving an education. In 2013, only 22% of children in the poorest households completed primary school, down from 35% in 2003. This means that the gap between the richest and poorest households has grown by nearly 20%. In the Times Higher Education World University Rankings, the best university in the country was ranked "401." Education for All (EFA), 2000-2015: Achievements and Challenges, published by UNESCO, "proposed that 15 to 20% of poor countries' national budgets be spent on education." It also recommended that countries spend between 4% and 6% of their GDP on education (Shuaib, 2020).

Nigeria is not doing enough to fund education, which is a universal human right, and the meager allocation is concerning. Thirty-one years after the United Nations Educational, Scientific, and Cultural Organization (UNESCO) (1990) recommended that developing countries devote 15 to 25% of their annual budgets to public education, Nigeria's allocation to the sector averaged 7.2 percent during the study period. In comparison, while Ghana and South Africa did not meet UNESCO's recommended 25 percent, they did far more than Nigeria, allocating a maximum of 23 percent and 16.7 percent, respectively (Adesina, 2021). The amount isn't enough to deal with problems like low education levels, a lot of kids not going to school, crumbling infrastructure, and a lack of teachers.

Foregone education expenditure represents the difference between 20% of total government expenditure and the actual amount spent on education in Nigeria during the study period. The national budget specifies financial activities, particularly commodities and services such as education, healthcare, power, roads, and life security. It also has an impact on monetary policy, such as interest rates, currency rates, and economic growth (Shuaib, 2020). Nigeria's low education budget allocation has resulted in inadequate infrastructure facilities in public schools, and those that do exist are in disrepair. Teachers decide their own pay and benefits, making unions more likely to do things that harm academic work and student education quality. Because there isn't enough money for education, groups like the Academic Staff Union of Universities (ASUU), the Non-Academic Staff Union (NASU), the College of Education Staff Union (COEASU), and the Nigerian Union of Teachers (NUT) often fight with the federal government.

The hypothesis of whether government expenditure affects economic growth has been tested in many countries using time-series and cross-sectional data. Examples of academics that have tested this theory are Biswal et al. (1999); Devlin and Hansen (2001); Samudram et al. (2009); Qi (2016); Dissou et al. (2016); Kagiso and Choga (2017); Anning et al. (2017); and Nurudeen and Usman (2020). Tabar et al. (2016) investigated the impact of educational expenditures by the government on aggregate economic growth in Iran. While Onoja et al. (2020) conducted a study on the effect of government education expenditure and educational development in Nigeria, which is close to the objective of this study, this study will also include the Nigeria education sector's budget shortfall (forgone expenditure) on the growth of the education sector. The budget is based on the UNESCO recommendation that 15–25% of total government expenditure should go to the education sector. This study wants to know if the government would have increased the growth of the education sector if it had followed this policy recommendation. The results could help

policymakers come up with budget-adjustment plans that focus on growth and set spending priorities.

The remainder of the paper is structured as follows. Section 2 provides the theoretical framework and literature review. Section 3 discusses the data and specifies the econometric model and methodology. The empirical estimates and results are reported in Section 4. Finally, the findings, conclusion, and recommendation are presented in Section 5.

2. LITERATURE REVIEW

2.1 Theoretical Framework

Government spending and economic growth have long been linked. According to various points of view, two major theories have dominated this debate: the Wagner and Keynesian schools of thought. Wagner a well-known German economist proposed a formula for determining government spending at the time. Based on his empirical findings, he concluded that an increase in government spending is a natural result of economic growth dominated this debate: the Wagner and Keynesian schools of thought. Wagner's law states that as economic growth accelerates, so does the share of government spending in GDP. As the economy grows, so does the demand for and complexity of social, administrative, and welfare issues. Keynes (1936) proposes a model in which fiscal policies could be used to stimulate economic activity during a recession. In other words, increased government spending and expansionary fiscal policy, among other things, can stimulate economic growth. Wagner's law and Keynesian theory take opposing positions when studying the relationship between government spending and growth. Wagner's model attempts to demonstrate that growth leads to government spending, whereas the Keynesian model (Kaynes, 1936) asserts that government spending during recession's leads to economic growth.

2.2 Empirical Framework

There is evidence in some studies that suggests experimental confirmation of both Wagner's and Keynes' hypotheses. For example, Inoja et al. (2020) conducted an experimental study on the effect of government education expenditure and educational development in Nigeria. The study found that spending on education can have different effects on different types of educational outcomes. The study used data from 1980 to 2016 and discovered that capital educational expenditure had a significant positive impact on all access measures, whereas recurrent educational expenditure had a weak positive impact. Finally, the findings indicated that educational expenditure had no discernible long-term effect on educational quality in Nigeria, implying that factors other than spending explain the quality of education in Nigeria. So, it is suggested that leaks in education spending be found using more creative ways for the government to spend money that involve both policymakers and planners in education and the budgeting process as a whole.

In their experimental studies, Devlin and Hansen (2001) and Biswal et al. (1999) confirmed a bidirectional causality between real GDP and real public expenditures. In contrast to other studies, none of the hypotheses in Huang's (2006) study were experimentally confirmed. As a result, it is clear that Wagner's law and Keynes' theory remain relevant. It is worth noting that in many studies, only the test for Wagner's law and the Keynesian hypothesis are performed using estimations based on a simple regression equation with only one independent variable. However, it is clear that a wide range of other factors influence GDP growth. Government spending, including education spending, has an impact on GDP growth. As a result, Chow et al. (2002) discovered a specification error in a simple regression involving GDP and government spending.

Nurudeen and Usman (2020) investigated the relationship between Nigerian government spending and economic growth. They built their model on Keynesian and endogenous growth models, using co-integration and error correction methods and time series data from 1979 to 2007, and discovered that total capital expenditure, total recurrent expenditure, and government spending on education all have a negative effect on economic growth. On the other hand, increased government spending on transportation and communication promotes economic growth. Kagiso and Choga (2017) investigated the relationship between government spending and economic growth in South Africa from 1990 to 2015 using the vector error correction model and Granger causality approaches. The model included time-series data for GDP, government spending, national savings, government debt, and the consumer price index, or inflation. The findings of the analysis revealed a negative long-run relationship between government spending and economic growth in South Africa.

Anning et al. (2017) identified 57 studies that evaluate educational outcomes rather than educational expenditure (e.g., enrolment rates, literacy rates, and years of schooling in the workforce). However, studies using educational expenditure as a proxy for education discovered that education had a positive effect on growth. According to Carmignani (2016), a recent study looked at 29 studies that specifically looked at the impact of government education spending on economic growth. In 14 of the 29 studies, government spending had a positive and statistically significant effect on growth, 12 had a negative effect, and three had no statistically significant effect. When all studies are taken into account, the effect of education spending on growth is positive but marginal. For every 1% increase in spending, growth increases by 0.2% to 0.3%.

Qi (2016) studied the impact of government education spending on Chinese economic growth while accounting for spatial third-party spillover effects. (1) Overall, government education spending in China has a significant positive impact on economic growth, but spending at different educational levels has different results. Government education spending on lower education is positively related to local economic growth, whereas education spending on higher education has no effect. (2) Neighboring government education spending has spatial spillover effects on local economic growth, and the spatial spillover effects differ at different education levels. (3) Third-party input factors also have spatial effects. Some educational and economic development policies are proposed. Meanwhile, this study recommends that corporate relationships between regions be prioritized. Dissou et al. (2016) calculated the growth implications of various methods of financing public education spending in a small open economy. They created a multi-sector endogenous growth model with human capital accumulation and considered a variety of fiscal instruments to finance the increase in government spending, including transfers to households, output, capital, and labor taxes. They discovered a significant difference in the growth impact caused by the financing method chosen. Their simulation results also indicate that, while all of the financing methods considered in this paper are growth-inducing in the long run, their transitional effects differ.

Wolf (2015) first re-examined the so-called cost disease model on the basis of a new formulation of the model, providing a new implicit price deflator for educational expenditures using data on educational spending for 31 OECD countries from 1988 to 2008 by level and type of expenditure. The disease effect in education is estimated to be one to two percentage points per year based on the GDP deflator at constant prices. Following that, he discovered, in contrast to many previous

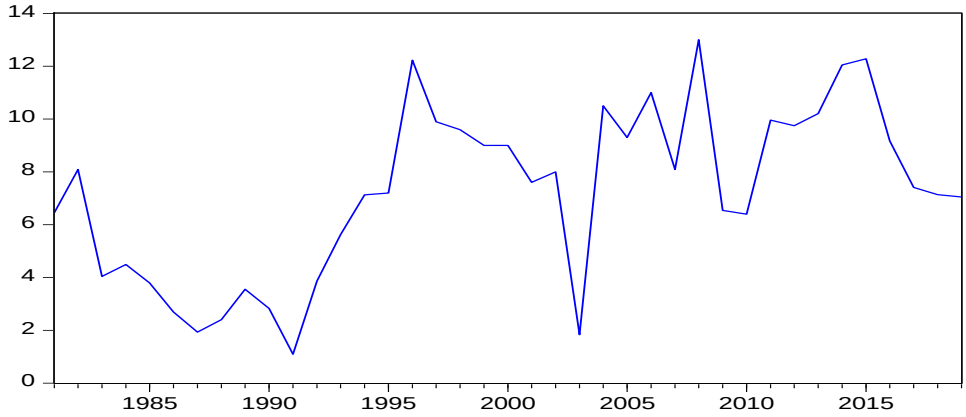
studies, a positive and significant effect of secondary educational spending deflated using the traditional GDP deflator on both PISA math and literacy scores (both significant at the one percent level).

Due to budgetary constraints, economic growth is prioritized over education spending in Nigeria. Though understanding the effects and implications of government spending and other fiscal instruments is important for economic reasons, understanding the causal relationship between education spending and GDP growth is important for political reasons. Third, regardless of the causal direction of the relationship, the relationship between education and growth is a double-edged sword. Many studies (for example, Kabuga and Hussaini, 2015) proposed econometric models based on the assumption that both recurrent and capital education expenditures have a direct impact on economic growth. Samudram et al. (2009) examined the impact of government spending on economic growth in Malaysia from 1970 to 2004 using Keynesian theory and Wagner's Law. Their research revealed that their variables were linked over time. The primary goal of this research was to put Wagner's law and the Keynesian hypothesis to the test in the Iranian economy using data from 1981 to 2019. The emphasis is on the relationship between the UNICEF (1990) recommendation shortfall, government education expenditure, and educational growth. Furthermore, a long-term relationship between economic variables was investigated using an appropriate estimation technique. To the best of our knowledge, this is the first study to look at VECM Granger causality. As a result, investigating the causality in relation to Nigeria's economy would most likely increase our understanding of the significance of following UNICEF recommendations. The two schools of thought—Wagnerian and Keynesian—can be considered when investigating the relationship between foregone expenditure, education expenditure, and education growth. Unlike previous studies, some control variables are included to reduce estimation error.

2.3 State of Nigeria Education

The state of Nigerian education got worse in the late 90s when the sector was starved of funding. This was gradually followed by infrastructural degradation and brain drain. The flight of these three elements pushed the education industry downhill. The main causes of the deterioration in the education sector can be ascribed to insufficient funding and inefficient usage of provided funds. Despite growing student numbers, the federal government, which is responsible for supporting federal universities, has not considerably raised the amount of the government budget committed to education during the last decade. Between 1981 and 2019, education spending ranged from 6.5 percent of the overall budget in 1981 to 12.3 percent in 2015, before falling to 7.05 percent in 2019. When compared to nearby Ghana, Ghana spent 7.4 percent (its lowest) of its budget expenditure on education in 1981, demonstrating its dedication to improving the sector, compared to Nigeria's 6.5 percent in the same year, despite having a larger population and even more resources. Ghana had the largest share of education expenditure (37.5%) in 2012, while Nigeria had the highest share (12.3% in 2015). In 2003, Nigeria had the lowest percentage at 1.83 percent (see figure 1).

Figure 1: Education Share of Total Expenditure (1981-2019)



Source: Computed by the researcher from http://www.indexmundi.com/ and educeleb.com

Due to financial concerns, Nigeria is the most common place of origin for overseas students from Africa. It sends the most students abroad of any African country, and outward mobility numbers are rapidly increasing. According to United Nations Institute of Statistics (UIS) data, the number of Nigerian students studying abroad increased by 164% between 2005 and 2015, rising from 26,997 to 71,351.The majority of Nigeria's public universities are in disrepair. And, while initiatives to increase capacity by constructing new universities have usually been helpful in terms of access, they have also caused concerns about instructional quality. Institutions and lecture halls in Nigeria are excessively overcrowded, student-to-teacher ratios have risen, and faculty shortages are frequent. Labs, libraries, hostels, and other university facilities are frequently described as being in disrepair. According to 2012 reports, only 43 percent of Nigeria's university teaching staff earned Ph.D. degrees, and Nigeria had one of the world's poorest lecturer-to-student ratios. According to WES (2020), the ratio of lecturers to students at the University of Abuja and Lagos State University, according to WES (2020), was as high as 1:22 and 1:14, respectively.

Rankings are typically poor predictors of university quality, but they are the greatest relative indication available. It is thus worth noting that only one of Nigeria's universities is currently ranked among the top 1,000 foreign universities in the Times Higher Education Ranking, the University of Ibadan, which is ranked 801. Universities in other African countries, such as South Africa, Ghana, and Uganda, are ranked far higher. Strikes have been virtually ritualistic at Nigerian universities since the mid-1990s, delaying graduations, disrupting lectures, causing salary losses for university workers, and further eroding already poor trust in the education system. For more than five months in 2013, 60 public colleges were paralyzed by strikes seeking funding hikes and greater employment perks for university workers. Strikes disrupted classes at ten federal and state institutions in 2016. (WES, 2020).

According to research, proper motivation is a prerequisite for achieving optimum productivity in any work situation. Inadequate compensation, a lack of incentives, and a lack of enthusiasm all contribute to the education sector's deterioration. Every worker is entitled to pay, just as sinners are compensated for their transgressions. This means that every teacher on the planet must be compensated. A public school teacher's annual salary in South Africa runs between $13,000 and $14,000, which is greater than the income of a public school teacher in Nigeria. In Nigeria, a primary school teacher with a TC II begins at Grade Level 4 and makes between $1,335 and $1,500

per year. Depending on their level, an NCE holder gets between $1,666 and $1,800 per year. The highest-paid employee in the primary school system is the head teacher, who makes roughly $6,000 per year. Another issue that has made the profession the last option for job applicants, particularly recent graduates, is inconsistent remuneration. Teachers will be in the correct state of mind to effect knowledge if the profession is recognized and the government pays teachers on time (Budgit, 2018).

3. METHODOLOGY

3.1 Data Source

The study makes use of time-series data (1981–2019). The data comes from the Central Bank of Nigeria (Statistical Bulletin, Annual Report, and Statement of Accounts) and the World Bank. Except for inflation, all data will be converted into a log-log equation for time series analysis. As a result, the coefficient can be viewed as elastic. Table 1 shows the variables and their sources.

Table 1: Variables Measurement and Sources of Data

S/No	Variables	Measurement	Sources of Data
1.	Real education sector output (RLGDP)	Measures the market value of all Nigeria's education products produced in a specific time period i.e. year (in billions).	Central bank of Nigeria (CBN) statistical bulletin volume 29, December 2020
2.	Government expenditure on education (REDXP)	Measures the total current and capital public expenditure on education it includes government spending on educational institutions (both public and private), education administration as well as subsidies for private entities (students/households and other privates entities) in a specific time period i.e. year (in billions)	https://www.indexmundi.com /facts/nigeria/education-expenditure
3.	Forgone education expenditure (FEDXP)	It represent the difference between 20% of the total government expenditure and the actual amount spent on education in a specific time period i.e. year (in billions).	Computed by the researcher
4.	Gross domestic investment (GDI)	It measures additions of capital goods, such as equipment, tools, transportation assets, and electricity (in billions). A proxy for infrastructure.	https://data.worldbank.org/indicator
5.	Human capital (HCAP)	Average years of secondary schooling, representing the numbers of years in school	https://data.worldbank.org/indicator

6.	Inflation rate (INF)	Annual percentages of average consumer prices a year- on - year changes	https://data.worldbank.org/indicator

Source: Researcher's Compilation, 2022

3.2 Model Specification

Most recent studies attempt to test Wagner's law using Peacock and Wiseman (1961), who calculated GDP growth using government expenditure; Gupta (1967), who used government expenditure and per capita GDP; and Goffman (1968), who used government expenditure as a share of GDP and per capita GDP. Because this study was conducted in a single country, the three methods mentioned will produce results that are not significantly different. The Wagner hypothesis can be tested using the proportion of GDP spent on government and per capita income. The Wagner hypothesis is tested in this study using total education expenditure and education contribution to GDP (education growth). It is preferable to use education expenditure and education contribution to GDP because the long-term elasticity of education expenditure versus education contribution to GDP can be estimated. Peacock and Wiseman's methodology is used in this study, which leads to the adoption of a two-way model in the literature, as follows:

$$G_t = \beta_0 + \beta_1 Y_t + v_t \quad (1)$$

Where G and Y are the natural logarithms of education's contribution to GDP (education growth) and education expenditure, respectively, and Vt is the error term. In addition to investigating the relationship between education expenditure and GDP contribution from education, the target variable "forgone educational expenditure" (FEDEXP) and GDP contribution from education were investigated. In order to reduce the severity of bias, the omitted variables of equation (1) were considered after considering the inflation rate, human capital, and gross domestic investment as control variables:

$$EDGDP = f(FEDXP, REDXP, INF, GDI, HCAP) \quad (2)$$

Our selected econometric method is VECM since the study is interested in assessing the impact of foregone education expenditures on education growth in both the short and long run. However, as a robustness test, we will also use OLS and VAR methods to assess the short-run impact of foregone education expenditures on education growth. To conduct empirical analysis using the VECM technique, the variables in the model must be either non-stationary and integrated in the same order, or stationary. We employ the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests to determine the order of integration of the variables. For both tests, the null hypothesis is that the variable has a unit root and the other variable is stationary.

The economic expectations of each the parameters of the explanatory variables in relationship with the dependent variable is stated below as

$f_1 > 0, f_2 > 0, f_3 < 0, f_4 > 0, f_5 > 0;$

This means that all the identified variables have positive relationship with education growth, while inflation is expected to exert negative influence on education growth.

Where:

EDGDP = Education growth;

FEDXP= Forgone expenditure;

REDXP = Real education expenditure;
INF= Inflation Rate;
GDI= Gross domestic investment
HCAP = human capital, proxied by number of years spent in secondary school
Equation 2 can be written in the econometric model and in their respective natural log form as thus;

$$LEDGDP_t = \beta_0 + \beta_1 LFEDXP_t + \beta_2 LREDXP_t + \beta_3 INF_t + \beta_4 LGDI_t + \beta_5 LHCAP_t + \varepsilon_t \quad (3)$$

LEDGDP is the natural log of education growth; LFEDXP is the natural log of forgone education expenditure; LREDXP is the natural log of real education expenditure, LGDI is the natural log gross domestic investment; LHCAP is the natural log of human capital, proxied by number of years spent in secondary school; L is natural logarithm; β_0 is the intercept or autonomous parameter estimate; $\beta_1 \ldots\ldots \beta_5$ is the Parameter estimate associated with the determinants of education growth in Nigeria and ε_t is the stochastic error term.

The entire estimation procedure consists of five steps: first, unit root test; second, lag selection; third, cointegration test; fourth, the error correction model estimation; fifth, Causality; and sixth, VAR stability test. The paper is based on the following hypotheses for testing the causality and co-integration between LEDGDP, LFEDXP, LREDXP, INF, LGDI, and LHCAP. (i) Whether there is a short-run relationship between government spending variables in Nigeria, namely LFEDXP, LREDXP, and LEDGDP; (ii) whether there is a long-run relationship between LFEDXP, LREDXP, INF, LGDI, and LHCAP; and (iii) whether there is causality between LEDGDP growth and LFEDXP, LREDXP, INF, LGDI, and LHCAP

4.0 RESULTS AND DISCUSSIONS OF FINDINGS

The analysis will be divided into two namely; descriptive statistics and empirical analysis.

4.1 Descriptive Statistics

Table 2. Summary Statistics of the variables (1981-2019).

	LEDGDP	LFEDXP	LREDXP	INF	LGDI	LHCAP
Mean	2.06	1.75	1.46	19.12	12.23	0.79
Median	2.31	1.93	1.91	12.10	12.40	0.78
Maximum	3.44	2.96	2.81	72.84	13.20	0.85
Minimum	0.53	0.20	-0.51	5.38	10.90	0.78
Std. Dev.	0.99	0.93	1.17	17.08	0.80	0.02
Skewness	-0.16	-0.38	-0.55	1.78	-0.36	2.22
Kurtosis	1.60	1.72	1.84	5.00	1.62	5.95
Jarque-Bera	3.36	3.60	4.19	27.17	3.92	46.27
Probability	0.19	0.17	0.12	0.00	0.14	0.00
Sum	80.16	68.18	56.75	745.56	477.00	30.77
Sum Sq. Dev.	37.43	32.86	51.85	11080.04	24.52	0.02
Observations	39	39	39	39	39	39

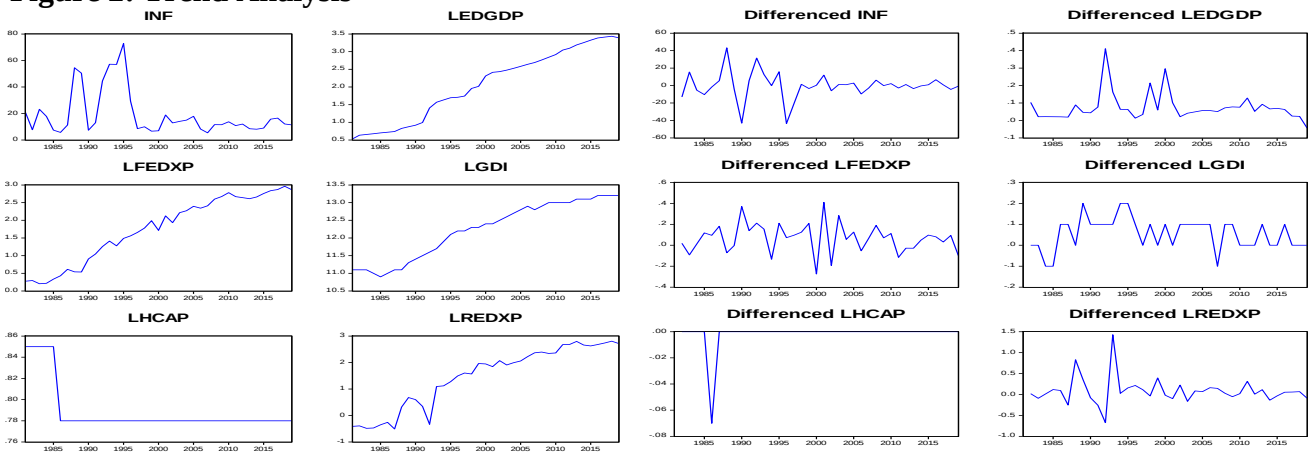
Source: Authors computation using Eviews 9, 2022.

Table 2 shows the summary descriptive statistics, which include sample means, maximums, minimums, medians, standard deviations, skewness, kurtosis, and the p-values for the Jarque-Bera tests. It is evident that all of the statistics exhibit properties common to most time series, such as platykurtic normalcy. There are some distinct differences between the variables. Firstly, inflation has the highest unconditional average (19.12%), whereas human capital has the lowest unconditional average (0.79%). The standard deviation reflects the volatility of the variables. It shows how far each variable deviates from the mean value. Inflation is the most volatile in the table above, at 17.08%, while real human capital is the least unpredictable, at 0.02%. The skewness of the data measures its asymmetry.

4.2 Series Trend Analysis

Data from time series often shows increasing or decreasing trends with volatility. As a result, trend analysis is required before unit root testing to determine whether or not the series has a unit root. Except for the inflation rate, the findings of the graphical depiction in Figure 2A show that the series exhibits a random walk with drift and trend. Figure 2B depicts a trend with a pattern of substantial variations, indicating that the series is non-stationary.

Figure 2: Trend Analysis



A: The Series In Their Raw (Undifferentiated) Form
Source: Researcher's Computation Using Eviews 9

B: Results Of The Series Trend Test After First Difference
Source: Researcher's Computation Using Eviews 9

4.3 Stationarity Test

4.3.1 Unit Root Tests

The Ender (2014) approach will be used to run unit root testing. The second ADF test at this level featured a trend and an intercept, while the third did not. The first difference was later tested in the data. Dickey and Fuller (1979) and Phillips and Perron (1998) present strategies for estimating the series. Table 3 summarizes the findings of the ADF tests at level, constant and trend, none, and first difference.

When evaluated at a level with a constant and constant trend, the variables are not stationary, as indicated by the asterisk. However, as indicated by the asterisk, we infer that the series is non-stationary since data is stationary when the ADF test statistics are less than the test critical values at $5\%(ADF\ test\ statistics < test\ critical\ value\ at\ 5\%)$. The corresponding probability value for stationary data is less than $0.05(P-value < 0.05)$. The Ender (2014) approach will be used to run

unit root testing. The second ADF test at this level featured a trend and an intercept, while the third did not. The first difference was later tested in the data. Dickey and Fuller (1979) and Phillips and Perron (1998) present strategies for estimating the series. Table 3 summarizes the findings of the ADF tests at level, constant and trend, none, and first difference.

Table 3: Unit Root Tests Result

Variables	ADF Test Statistic				PP Test Statistic			
	Constant	Constant and Trend	None	First Difference	Constant	Constant and Trend	None	First Difference
LEDGDP	-0.82	-1.17	2.03	-4.64*	-0.82	-1.43	3.19	-4.64*
LFEDXP	-2.54	-0.76	1.57	-9.14*	-1.20	-1.40	2.47	-9.01*
LREDXP	-1.27	-2.67	0.43	-7.65*	-1.46	-2.61	0.69	-11.55*
INF	-2.91	-2.29	1.70	-5.68*	-2.79	-2.86	-1.79	-9.69*
LGDI	-0.90	-0.46	4.88	-4.26*	-0.82	-1.17	-3.49	-4.37*
LHCAP	-1.18	-1.77	-1.05	-6.08*	-1.18	-1.82	-1.08	-6.08*

Notes (ADF): Test critical values at 5% (At level: constant = -2.92, Constant and trend = -3.50, none = -1.94 while at First difference = -2.92); P-value= Probability value, * signifies stationarity.
Notes (PP): Test critical values at 5% (At level: constant = -2.92, Constant and trend = -3.50, none = -1.94 while at First difference = -2.92); P-value= Probability value, * signifies stationarity.

4.3.2 The Phillips–Perron Unit Root Test

The PP test has an advantage over the ADF test in that it corrects any heteroscedasticity and serial correlation in the error terms (u_t). PP tests, which are based on a serially correlated regression error term, do not require lag selection. The null for PP, like the ADF test, is predicated on the assumption that the series are non-stationary. The PP test results are shown in Table 3 above. According to the results, the series is non-stationary at level but stationary at the first difference. Figure 2B depicts the variables in differenced form. This result validates the usage of the VAR model for estimation.

4.4 Determination of Lags

Table 4 reports lag-order selection statistics. Criteria of SC FPE, HQIC, LR, and AIC show lag order of three. AIC has the lowest value. So the study will proceed further tests with lags (3).

Table 4: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-41.25012	NA	5.56e-07	2.625007	2.888927	2.717122
1	140.8213	293.3373	1.71e-10	-5.490073	-3.642634*	-4.845267
2	187.5970	59.76890	1.12e-10	-6.088721	-2.657763	-4.891225
3	243.5446	52.83941*	6.14e-11*	-7.196922*	-2.182445	-5.446735*

Source: Researcher's calculations from Eviews 9, 2022. * indicates lag order selected by the criterion

4.5 CointegrationTest

Having verified that all variables are integrated to order one $I(1)$, the next step is to perform cointegration test. Due to the fact that there are multivariate time series, the multivariate cointegration technique proposed by Engle and Granger (1987) is applied to determine whether there are stable long-run relationship.

Table 5: Cointegration Results

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Prob.**	Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	213.7349	95.75366	0.0000	None *	92.46661	40.07757	0.0000
At most 1 *	121.2683	69.81889	0.0000	At most 1 *	54.47977	33.87687	0.0001
At most 2 *	66.78855	47.85613	0.0003	At most 2 *	29.79343	27.58434	0.0256
At most 3 *	36.99512	29.79707	0.0062	At most 3 *	23.70503	21.13162	0.0212
At most 4	13.29010	15.49471	0.1046	At most 4	12.93873	14.26460	0.0801
At most 5	0.351373	3.841466	0.5533	At most 5	0.351373	3.841466	0.5533

Source: Researcher's calculations from Eviews 9, 2022. * Denotes rejection of the null hypothesis at the 0.05 level

The major aim of this test is to ascertain whether a linear combination of the integrated variable is becoming stationary over the long-run, if this hold, then it means cointegration exists among the variables, this further implies that there is existence of long run relationship among the variables. Table 5 indicates the presence of a long-run growth relationship among all the variables as both trace and Max-Eigen statistics indicated 4 cointegrating equation among the variables.

4.7 Vector Error Correction Model (VECM) Estimation

In an attempt to determine the appropriate model on the empirical relationship between forgone education expenditure and education growth in Nigeria, two Vector Auto-regression Models (VAR and VEC) were built using the same variables. The VEC model, although non- structural as the VAR, served as its restricted counterpart. Meanwhile, the existence of cointegration relationship between the variables as reported in Table 6, invalidated the adoption of the VAR. The Vector Error Correction Model (VECM) becomes the appropriate model under this condition. The result is presented in two sections, the first section shows the cointegrating equations and the second section presents the result of the Vector Error Correction models. The regression result is presented in Table 7.

Table 6: The Result of Vector Error Correction Model

Error Correction:	D(LEDGDP)	D(LFEDXP)	D(LREDXP)	D(INF)	D(LGDI)	D(LHCAP)
ECT	-0.14	-0.43	0.25	14.57	-0.12	0.01
D(LEDGDP(-1))	-0.15	1.05	1.70	61.34	0.20	-0.06

D(LEDGDP(-2))	0.43	-1.48	-1.13	35.87	-0.07	0.07
D(LEDGDP(-3))	-0.32	-0.06	0.95	32.95	0.16	0.02
D(LFEDXP(-1))	0.07	0.22	0.53	14.45	0.51	-0.05
D(LFEDXP(-2))	0.53	0.16	-0.54	26.65	0.16	-0.02
D(LFEDXP(-3))	0.23	-0.56	0.09	-27.20	-0.18	0.03
D(LREDXP(-1))	-0.21	-0.35	0.19	5.89	-0.03	0.00
D(LREDXP(-2))	-0.06	-0.23	0.20	11.97	-0.01	0.00
D(LREDXP(-3))	-0.01	-0.33	-0.06	-13.71	-0.12	0.01
D(INF(-1))	0.00	0.01	0.00	0.04	0.00	0.00
D(INF(-2))	0.00	0.00	0.01	-0.53	0.00	0.00
D(INF(-3))	0.00	0.00	-0.01	0.15	0.00	0.00
D(LGDI(-1))	-0.53	-1.02	-0.16	6.33	-0.42	0.11
D(LGDI(-2))	-0.29	-0.19	1.56	32.13	-0.14	0.06
D(LGDI(-3))	-0.28	-0.68	0.98	-12.25	-0.01	0.05
D(LHCAP(-1))	1.97	-0.41	-2.83	-78.79	-0.71	-0.24
D(LHCAP(-2))	0.38	1.11	-10.83	-603.32	0.06	0.01
D(LHCAP(-3))	1.68	10.01	-5.53	255.65	1.14	-0.49
C	0.12	0.35	-0.26	-15.40	0.05	-0.02
R-squared	0.71	0.86	0.80	0.91	0.78	0.48

Source: Researcher's calculations from Eviews 9, 2022.

Table 6 above show that the error correction term of the target equation D(LEDGDP) and that of D(LFEDXP) and D(LGDI) is negative while that of D(LREDXP), D(INF), D(LHCAP) are positive. The R squared of the equations in the VEC model shows that about 71% percent and 86%, 80%, 91%, 78% and 48% of the variation in the dependable variables are explained by the models respectively. This indicates that the six models are fit.

Simultaneous equation has been established and estimated by VAR through the VECM procedure in Table 6. However, the simultaneous equation estimated under VAR through VECM procedure only provides the coefficients, standard errors and t-statistics but there is no provision for probability values. Therefore, there is the need to estimate the simultaneous equation as a basis for measuring the relationship between forgone education expenditure and other explanatory factors on education growth. This is because t-statistic is first appropriate for a study involving two samples and within-groups design. As such, this being a simultaneous model interpreting results based on t-statistics results becomes inappropriate. Second, t-statistics are not appropriate for a sample size greater or equal to 30 ($n \geq 30$) as in this study. The independent variables have the

variances of the two groups but are not homogeneous Johansen (1995). To establish the impact of the explanatory variables on Nigeria's education growth, the study estimates the simultaneous equation by employing OLS.

Table 7: Error Correction Result

	Coefficient	Std. Error	t-Statistic	Prob.
ECT	-0.14331	0.078192	-1.83278	0.0868
D(LEDGDP(-1))	-0.15394	0.255313	-0.60295	0.5556
D(LEDGDP(-2))	0.433301	0.340712	1.271754	0.2228
D(LEDGDP(-3))	-0.3215	0.245864	-1.30761	0.2107
D(LFEDXP(-1))	0.072137	0.175895	0.410112	0.6875
D(LFEDXP(-2))	0.526923	0.184096	2.862217	0.0119
D(LFEDXP(-3))	0.234686	0.200303	1.171658	0.2596
D(LREDXP(-1))	-0.20791	0.118124	-1.76012	0.0988
D(LREDXP(-2))	-0.05931	0.107821	-0.55004	0.5904
D(LREDXP(-3))	-0.00661	0.092413	-0.07148	0.944
D(INF(-1))	0.00038	0.001847	0.205919	0.8396
D(INF(-2))	-0.00242	0.001214	-1.99285	0.0648
D(INF(-3))	0.000458	0.001408	0.325017	0.7497
D(LGDI(-1))	-0.53199	0.337022	-1.57851	0.1353
D(LGDI(-2))	-0.28802	0.314586	-0.91556	0.3744
D(LGDI(-3))	-0.28357	0.275087	-1.03083	0.319
D(LHCAP(-1))	1.974332	1.328951	1.485632	0.1581
D(LHCAP(-2))	0.37525	1.196874	0.313525	0.7582
D(LHCAP(-3))	1.680964	2.349562	0.715437	0.4853
C	0.120538	0.058837	2.048685	0.0584

Source: Researcher's calculations from Eviews 9, 2022.

Table 7 accounts for an error correction of -0.14331. Having a negative sign attached to this term explains how the disequilibrium gradually disappears between the short and the long run. As a result of this, the short run values of output will gradually converge to the long run path by a 14% level of adjustment yearly. However, the results further reveal that the coefficient of forgone education expenditure has a significant positive relationship with education growth in the second lag, which is in line with the Apriori expectation. The result indicates that a 1% increase in LFEDXP will increase LEDGDP by 0.53% in the second lag. The first lag of real education expenditure (LREDXP) has a significant negative relationship with education growth, which is not in line with our Apriori expectation. The result indicates that a 1% increase in LREDXP will decrease LEDGDP by -0.20% in the first lag. A 1% increase in inflation (INF) will decrease education growth by 0.002%, which is in line with our Apriori expectation. From the first difference of LGDI up to the third difference, there is an insignificant negative relationship with educational growth during the year of study. Also, the first, second, and third lags of human capital have an insignificant negative relationship with education growth, which is not in line with our Apriori expectation. Furthermore, R^2 measures the joint statistical influence of explanatory variables in explaining the dependent variable, as shown by the coefficient of determination value of 0.713744, which accounts for 71% of the variation in LRLGDP between the years 1981 to 2019. The error term is what explains the other 29%, which can't be explained by the model.

4.8 Simultaneous Equation Short-Run Simulation and Analysis

The results of the short-run test are presented below:

Table 8: Wald Tests and Short-run Test

Dependent Variable: DLEDGDP			
Variables	Chi-square test	Prob.	Relationship
D(LFEDXP)	8.83	0.03	Short-run causality
D(LREDXP)	4.22	0.24	No short-run causality
D(INF)	4.19	0.24	No short-run causality
D(LGDI)	3.37	0.34	No short-run causality
D(LHCAP)	2.66	0.45	No short-run causality
ALL	34.41	0.00	Short-run causality

Source: Researcher's calculations from Eviews 9, 2022.

Table 8, According to our findings, there exist a short-run relationship between the explanatory variables and the independent variable, as indicated by the Chi-square joint statistics probability values. The p-value of chi-square test for forgone education expenditure (LFEDXP) is less than 0.05, the null hypotheses ($H0$): $\beta 5=0$ will be rejected, therefore LFEDXP cause LEDGDP in the short run. The rest of independent variables don't cause LEDGDP in the short run. The next step is to conduct exante forecasting involving impulse response and variance decomposition tests.

4.9 Impulse Response Function

The impulse response function is critical in determining how and to what extent shocks to independent variables affect educational growth. Table 9 shows the dynamic effects of a one-standard deviation shock from the independent variables on LEDGDP in Nigeria over a five-year period.

Table: 9: Impulse Response Analysis

Response of LEDGDP:						
Period	**LEDGDP**	**LFEDXP**	**LREDXP**	**INF**	**LGDI**	**LHCAP**
SHORT-RUN	0.065784	0.003444	-0.01165	0.002257	-0.00815	0.00287
LONG-TERM	0.057827	0.005695	0.003062	-0.0023	-0.01306	0.000191

Source: Researcher's calculations from Eviews 9, 2022.

Forecasts for education growth in Nigeria show both positive and negative tendencies due to shocks and innovations, with variations. According to the results in table 9, education growth own shock (LEDGDP), forgone expenditure (LFEDXP), and human capital proxied by the number of years spent in secondary school (LHCAP) will account for increasing education growth in the country, while inflation (INF) and gross domestic investment (LGDI) will account for decreasing

growth. In the short run, real education expenditure (LREDXP) will account for declining education growth. Figure 3 explains the outcome further.

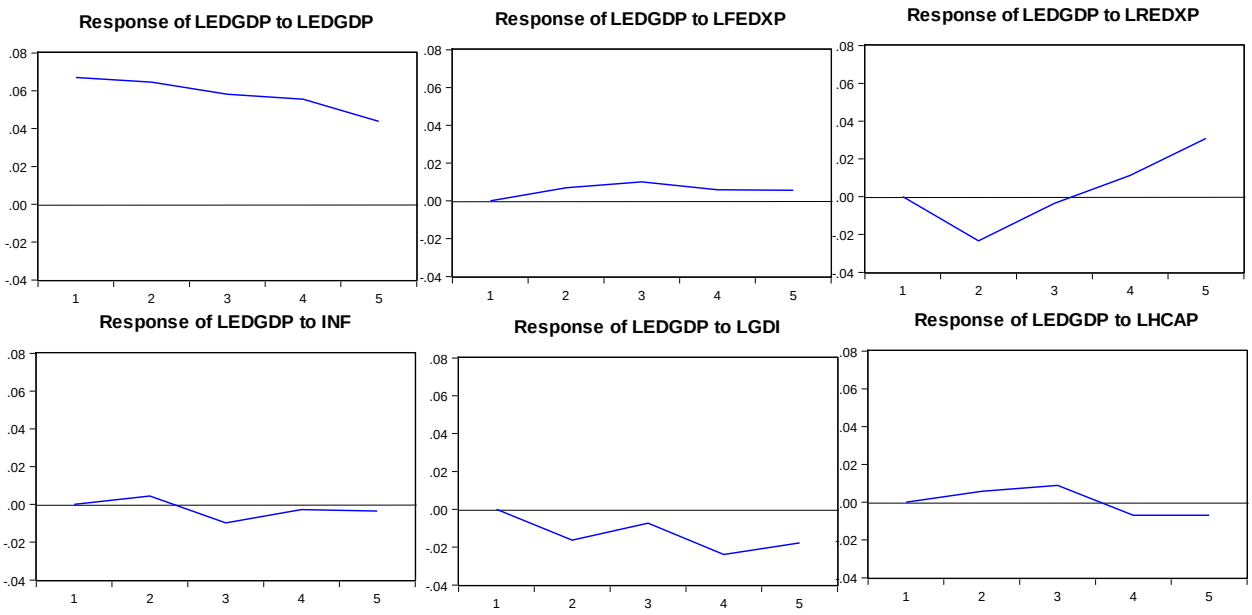


Figure 3: Impulse Response of LEDGDP to Dependent Variables

First, a one-standard deviation positive own shock causes a change in the short run of 0.07 and remains constant in the long run. Second, estimates show that foregone education expenditure (LFEDXO) has a positive impact on education growth (LEDGDP) in both the short and long run. A one-standard deviation shock from foregone education expenditure (LFEDXO) causes education growth to increase by 0.003 in the short run, according to the simulation. In the long run, the shocks will increase by 0.005, decreasing LFEDXO's effect on education growth in both the short and long run. This suggests that while UNESCO's suggestion of 15-20% is crucial for the nation's education growth over the next five years, it does not accelerate education growth. A one-positive standard deviation shock to real education expenditure (LREDXP) will cause education growth to decrease by -0.01 in the short run, according to the third forecast. In the long run, the shocks will increase to 0.003. According to the fourth forecast, inflation (INF) will be a concern for the country and will decrease. In the long run, a one-standard-deviation INF negative shock causes LEDGDP to fall by -0.002. This means that lower inflation will hurt the growth of education in Nigeria in the long run.

Fifth, forecasts indicate that the nation's gross domestic investment (LGDI) will be a worry and that it will decline. After a one-standard deviation positive shock, LGDI decreases by -0.008 in the short run and by 0.013 in the long run. This suggests that increasing gross domestic investment will have a negative influence on Nigeria's educational growth. Sixth, human capital innovations, as measured by the number of years spent in secondary school (LHCAP), lead education growth to be positive in the short run. According to simulations, a one-standard deviation shock to LHCAP causes education growth to increase by 0.003 in the near run and improve at a decreasing pace to 0.001 in the long run. This suggests that while the number of years spent in secondary school is significant for the nation's educational progress over the five periods, it does not speed up education growth.

4.10 Variance Decomposition

To forecast the error variance effects for each endogenous variable in a system, a variance decomposition is used. In a basic linear equation, any change in at any time corresponds to a change in as a dependent variable (Wickremasinghe, 2011). The forecast in this study is comprised of three short-run (two years), medium-term (five years), and long-run (ten years) forecasts based on the Monte Carlo technique and ordering by Cholesky (ten years). The results of a variance decomposition forecast for endogenous variables are education growth, forgone education spending, real education spending, inflation, gross domestic investment, and human capital measured by the number of years spent in secondary school.

Table 10: Variance Decomposition

PERIOD	LEDGDP	LFEDXP	LREDXP	INF	LGDI	LHCAP
SHORT-RUN	95.25	0.25	2.84	0.11	1.39	0.17
MEDIUM-TERM	90.52	0.75	4.36	0.49	3.25	0.63
LONG-RUN	71.26	0.75	15.79	0.66	3.83	7.71

Source: Researcher's calculations from Eviews 9, 2022.

In the short-run, impulses, innovations, or shocks to education growth account for 95.25% of fluctuations in education growth own shock. However, the education growth rates own shock fluctuations continuously decline to 71.26% in the long-run. Meanwhile, shocks to forgone education expenditure account for 0.25% of the fluctuations in education growth in the short-run. In the long run, the fluctuations in education growth due to foregone education expenditure amount to 0.75%. In the short-run, shocks to real education expenditure account for 2.84%, inflation accounts for 0.11%, gross domestic investment 1.39%, and human capital, proxied by the number of years spent in secondary school, accounts for 0.17%. In the long-run, shocks to real education expenditure account for 15.79%, inflation accounts for 0.66%, gross domestic investment 3.83%, and human capital, proxied by the number of years spent in secondary school, accounts for 7.71%. The biggest changes in Nigeria's education growth will be caused by shocks to education growth and real education spending.

4.11 VAR Model Checking

Employing VAR, the model was estimated via VECM procedure using three lags, where the endogenous variables were transformed to first difference via the error correction term. The error correction term which indicates the long-run equilibrium has been reported in Table 7, while the short-run relationship is reported in Table 8. Before discussing the findings, the VECM model will be validated for normality, serial correlation and stability.

4.11.1 Test for Normality

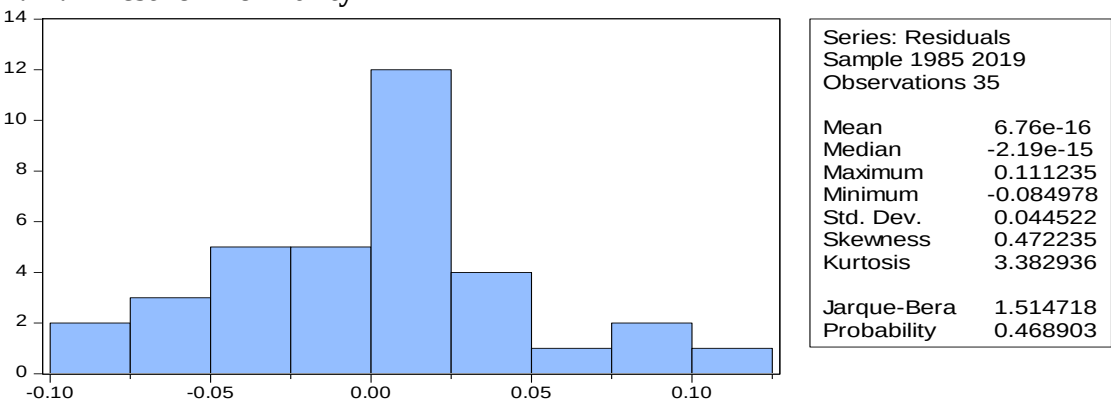


Figure 4: Test Results for Normality

According to our results in figure 4, skewness is 0.47 while the kurtosis indicates 3.38. The JB is indicated by 1.51, with a corresponding probability value not significant at 5% critical value. Based on this test, our model is normally distributed.

4.11.2 Autocorrelation Residual LM Test

The LM Test is commonly used to test for serial correlation in autoregressive model-one $[AR(1)]$. LM Test statistic computes lag order p based on an auxiliary regression of the residuals of the estimated regression under the hypothesis that there is no serial correlation from lag three. The results of the LM are indicated below.

Table 11: Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.059342	Prob. F(3,12)	0.9802
Obs*R-squared	0.511653	Prob. Chi-Square(3)	0.9163

Source: Researcher's calculations from Eviews 9, 2022.

The results of Table 11 shows that the null hypothesis of no serial autocorrelation will be accepted for Godfrey LM test for 3 lags since their p-values are greater than the significance values of 0.05 and 3 lags rejects the null hypothesis that there is serial autocorrelation. Hence we can conclude that there is no serial autocorrelation since the majority of the lags accept the null hypothesis.

4.11.3 Test for Stability

Stability is tested by conducting CUSUM of squares test and recursive coefficients stability test.

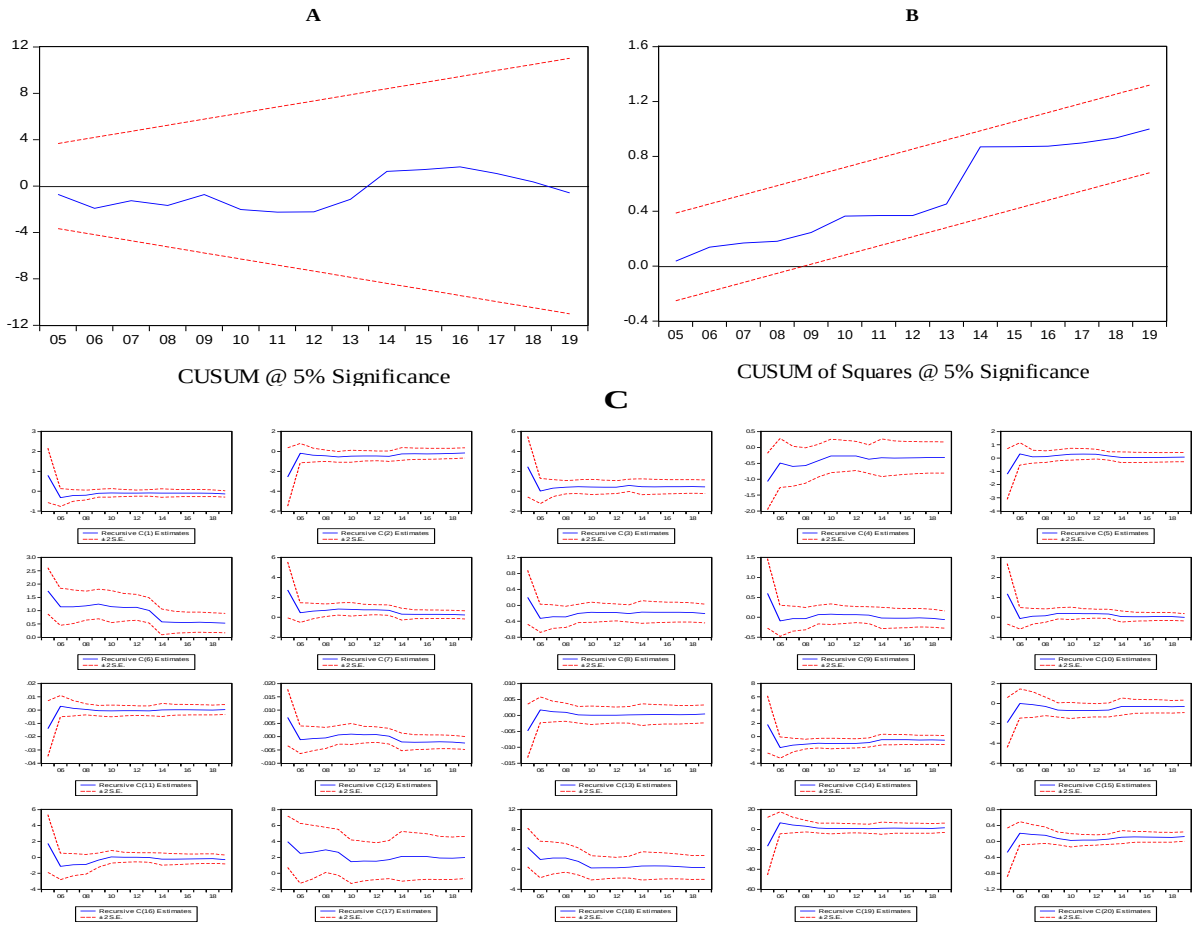


Figure 5 (A, B & C): Tests Results for Stability

The results are indicated in Figures 5A, 5B and 5C. All tests indicated that the systems equation is valid and provides sufficient results for economic analysis. Recursive residual estimates was employed to check structural change instability. Findings indicate an absence of any instability because the Cusum and Cusum of squares plots test statistic and the recursive coefficients are confirmed within the 5% critical bounds of parameter stability. This means that we accept the null hypothesis and conclude that our parameters are stable, and as such are without misspecification. In conclusion, following the diagnostic tests conducted, normality and serial correlation, all probability values are greater than 5% critical values which suggests that our model is valid because all probability values for the tests are greater than 5%, meaning that our education output growth equation is valid for economic analysis.

4.12 Discussion of Findings

To investigate the determinants of short-and long-run education growth in Nigeria, the study estimated a series of VECM specifications for the growth rate of the recommendation by UNESCO, which we call forgone expenditure in this study together with other variables. The model specification is explained in the previous section III. Tables 6 and 7 present the estimated short and long-run relations from the VECM. The study will only discuss the variables of interest: the forgone education expenditure and real education expenditure. Results from Table 7 illustrate that in the short-run, the main driving force behind education growth could have been the

UNESCO recommendation of 20 percent. The coefficient of its second lag is statistically significant and can grow education by 53%. The first lag coefficient of real education expenditure is statistically negative, with a 1% increase in the first lag reducing education growth by 21%.These findings show that the root causes of the decline in the education sector are inadequate funding and improper utilization of provided funds. Government spending in the sector is relatively small when compared with other African countries. In 2018, according to the World Bank, Ghana spent 18.6% of its budget expenditure on education, which shows its commitment to improving the sector. This is compared with Nigeria's 7.1% in the same year, despite the fact that Nigeria has a larger population and even more resources. This is one of the main reasons why the majority of our politicians and well-to-do in our society send their children to Ghana to study.

The forgone expenditure findings also show that the crucial factor in promoting human capital development and, of course, education outcomes in Nigeria is public education spending. Adhering to the UNESCO recommendation will be of immense importance because of the high level of poverty that exists in the country. Subsidizing education will improve the opportunity of individuals to attain a good education and, thereby, exit poverty and crime. Teachers and lecturers will be well remunerated, research materials will be more available, and enrolment into primary and secondary schools will improve. Higher education outcomes are associated with higher spending.

Finally, the short-run causality findings of a short-run relationship between the forgone expenditure variable and the education growth variable as indicated by the Chi-square statistics probability value is in line with Benos and Zotou (2020) law, that an increase in the size of government expenditure is a natural consequence of economic growth. In other words, Wagner's law pontificates that the share of government expenditure in GDP will increase with intensified economic development. Also, the long-run causality from the independent variables to education growth indicates that there is causality. This is because the error correction term coefficient (ECT) of 0.143309 is negative and significant, meaning that there is long-run causality from the dependent variables to education growth in Nigeria.

5. CONCLUSION AND POLICY RECOMMENDATION

The purpose of this study is to examine empirically the influence of foregone education expenditure on education growth in Nigeria from 1981 to 2019.The variables used, such as forgone education expenditure, are regarded as independent variables while education growth is regarded as a dependent variable, and the rest, such as real education expenditure, inflation, gross domestic investment, and human capital proxied by the number of years spent in secondary school, are regarded as controlled variables. The data was tested for stationarity using ADF and PP; the results showed that they became stationary under both ADF and PP after converting them into the first difference. The paper found a lag order selection criterion and the results showed that the lag selection criterion was 3. Furthermore, Engle and Granger (1987) used the co-integration test and the VECM to examine long-run and short-run relationships between variables, and the results revealed long-run associations and short-run relationships running from independent variables toward education growth using Max-Eigen and Trace statistics values tests, indicating four co-integrating equation(s) at the 0.05 level, as well as the Wald test. Finally, we checked the diagnostic test of the residuals and the stability of the model. The results showed that the residuals were free from serial correlation, normally distributed, and the model was stable as well. The paper

recommends that the government increase the share of education expenditure to meet the UNESCO recommendation of 15-20 percent. In addition, government expenditure on education should be properly managed in order to enhance educational growth.

References

Abu-Bader, S. and Abu-Qarn, A.S. (2003). Government expenditures, military spending and economic growth: causality evidence from Egypt, Israel, and Syria, *Journal of Policy Model* 25(6-7):567-583.

Adesina, W. (2021). Against UNESCO's recommendation, Nigeria budgets only N3.6trn of N55.3trn for education in 6yrs. Accessed from https://www.vanguardngr.com/2021/10/against-unescos-recommendation-nigeria-budgets-only-n3-6trn-of-n55-3trn-for-education-in-6yrs/ @ 7.pm 13/03/2022.

Anning, L. Haisu, W. and. Riti, J. (2017). Government Spending and Economic Growth in Ghana: Evidence from Granger Causality Analysis. *International Journal of Management Science and Business Administration.* Volume 3, Issue 2, January.

Benos, N. and Zotou, S. (2014). Education and economic growth: A meta-regression analysis. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S0305750X14002009 @ 8.00am 12/03/2022.

Biswal, B., Dhawan, U., and Hooi-Yean, L., (1999). Testing Wagner versus Keynes using disaggregated public expenditure data for Canada. *Applied Economics*, 31(10), 1283-1291.

Budgit (2018). Education financing: Analysis and recommendations. Retrieved from https://yourbudgit.com/wp-content/uploads/2018/11/Education-financing.pdf @ 1.09pm 13/04/2022.

Carmignani, F. (2016). Does government spending on education promote economic growth? Retrieved from https://theconversation.com/does-government-spending-on-education-promote-economic-growth-60229 @ 8.30 12/06/2021.

Chow, Y-F., Cotsomitist, J. A., and Kwan, A. C. C., (2002), Multivariate cointegration and causality tests of Wagner's hypothesis: evidence from the UK. *Applied Economics, 34*(13), 1671-1677.

Devlin, N., and Hansen, P., (2001). Health care spending and economic output: granger causality. *Applied Economics Lett*, 8(8), 561-564.

Dickey, D.A. and Fuller, W.A. (1979). Distribution of the estimators for autoregressive time series with a unit". *Journal of the American Statistical Association*, 77, Pp. 427-431.

Dissou, Y., Didic, S. and Yakautsava, T., (2016). Government spending on education, human capital accumulation and growth. *Economic Modelling* 58, 9-21.

Engle, R.I. and Granger, C.W. (1987). Co-integration and error correction: representation, estimation and testing. *Econometrica*, 55(2): 251-276. https://data.worldbank.org/indicator/SE.XPD.TOTL.GB.ZS?locations=GH.

Goffman, I. J., (1968). On the empirical testing of Wagner's law: a technical note. *Public Finance* 23, 359-364.

Gupta, SP., (1967). Public expenditure and economic growth: a time series analysis. *Public Finance*, 22, 423-466.

Huang, C, J., (2006). Testing Wagner's law using bounds test and a new granger non-causality test: evidence for Taiwan. *Journal of American Academy of Business*, 8(2), 86-90.

Ige, A.M. (2016). Financial allocation to education: Trends, issues and way forward in Nigeria. *Journal plus education*. Vol. XIV, No 1.

Johansen, S. (1995). Likelihood-based inference in cointegrated vector autoregressive models". *Oxford University Press*: Oxford.

Kabuga, N.A and Hussaini, M. (2015). Government spending on education and economic growth in Nigeria: an empirical investigation. *Kano Journal of Educational Studies* (KAJEST). Vol. 4 (3) December.

Kagiso, M. and Choga, I. (2017). Government expenditure and economic growth in South Africa: A vector error correction modelling and granger causality test. *Journal of Economics and Behavioral Studies*. Vol. 9, No. 4, August.

Keynes, J.M. (1936). The general theory of employment, interest and money. *New York: Harcourt, Brace and Co.*

Mutuku, C.M and Kimani, D.K. (2012). Investigating Wagner's law: Cointegration and granger causality tests for Kenya, *Current Research Journal of Economic Theory*, 4(2) 43-52 2012.

Nurudeen, A. and Usman, A. (2010). Government expenditure and economic growth in Nigeria, 1970-2008: A disaggregated analysis". *Business and Economics Journal*, 1–11.

Ola, V. (1998). Education in national development. *Vanguard Newspaper*. August 2.

Onoja, J.W., Okafor, S. O. and 2 Akaolisa, C.J. (2020). Government education expenditure and educational development in Nigeria. *Journal of Economic Studies (JES).* Vol. 17, Issue No 1.

Peacock, A, T., and Wiseman, J., (1961). The growth of public expenditure in the United Kingdom. Princeton University Press, Princeton.

Phillips, P.C.B. and Perron, P. (1998). Testing for a unit root in time series regression. *Biometrika* 75, 335346.

Qi, J. (2016). Government Education Expenditure, Third-party Spillover Effect and Economic Growth in China. *Journal of Sustainable Development*, 9(2), 145-152.

Samudram, M. Nair, M. and Vaithilingam, S. (2009). Keynes and Wagner on government expenditures and economic development: the case of a developing economy. *Empirical Economics*, 36(3), 697-712.

Shuaib, S.Y. (2020). Budget and education in Nigeria" retrieved from https://www.vanguardngr.com/2019/11/sdg-2020-budget-and-education-in-nigeria/ @ 2.00pm 12/06/2021.

Tabar, F.J., Najafi, J. and Badooei, Y.S. (2016). The impact of educational expenditures of government on economic growth of Iran. Accessed from https://www.redalyc.org/journal/3223/322349942013/html. @ 2.30pm 2/3/2021.

UNICEF, (2019). Guidelines for developing an education budget brief. Retrieved fromhttps://www.unicef.org/esa/sites/unicef.org.esa/files/2019-04/Guidelines-Developing-a-Education-Budget-Brief-March-2019.pdf @ 8.00pm 11/6/2021.

Wagner, A. (1883). Three extracts on public finance. In: Musgrave, R.A. and A.T. Peacock, (Eds.), 1958, Classics in the Theory of Public Finance. *Macmillan*, London.

WES Staff, (2017). Education in Nigeria. Retrieved from https://wenr.wes.org/2017/03/education-in-nigeria @ 1.30pm 12/06/2021.

Wickremasinghe, G. (2011). The Sri Lankan stock market and the macroeconomy: an empirical investigation". *Studies in Economics and Finance*, vol. 28, no. 3, pp. 179-95.

Wolff, E. N., (2015). Educational expenditures and student performance among OECD countries. *Structural change and Economic Dynamics* 33, 37-57.