



## **Public Capital and Recurrent Education Expenditures and Economic Growth in Nigeria: An Empirical Investigation**

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### **Abstract**

*Over the years, researchers have found conflicting results regarding the relationship between public education expenditure and economic growth in Nigeria and there seem to be no clear distinction regarding which of capital and recurrent components contributes more to the growth of a nation's economy. Hence, this work empirically investigated the impact of capital and recurrent public education expenditure on economic growth in Nigeria so as to ascertain which component contributes more to economic growth. The study applied ordinary least squares technique on time series data for the period, 1981-2016 and found that capital component of the total education expenditure had stronger impact (17%) on the nation's economy (GDP) than its recurrent counterpart (13%). The Granger Causality test showed that while capital education expenditure granger causes economic growth in Nigeria, recurrent education expenditure does not. This work therefore recommends that Nigerian government should step up her yearly budgetary allocation to education from the current single digit averaging about 7% of the total budget to double digits so as to boost the growth of her economy and that such allocation should pay more attention to the capital component as it promotes growth more than its recurrent counterpart.*

**Keywords:** Capital expenditure, Recurrent expenditure, Education Expenditure, Economic Growth, Empirical Investigation

## **1. Introduction**

In recent times, much attention has been given to human capital development as one of the key forces that can spur growth and development. According to Becker (1964), investment in human capital, part of which is education, raises an individual's productivity and earnings in particular, and impacts on the growth of the economy in general through its spillover effects. The key idea here is that a highly educated labour force is expected to be relatively more productive than an uneducated labour force. Works done by Lucas (1988), Mulligan and Sala-i-Martin (1993) and Baro and Sala-i-Martin (1995) underscore the importance of human capital (education) and its contribution to economic growth globally.

Every government in any part of the world is saddled with the responsibility of formulating policies and initiating programs and actions that will help them achieve their core macroeconomic goals. One of such goals that has proven itself from recorded history as the most important and primary target of every economy is the achievement of sustained economic growth used in the assessment of the economic health of any nation of the world (Greg & Agboro, 2014). Economic growth is spurred by a plethora of factors and governments across the world adopt different policies and programs to see that their economies move steadily on the path of growth. One of such measures adopted by governments is the use of fiscal policy.

Fiscal policy involves the use of government revenue and expenditure variables to control or influence the behaviour of the economy or that of the macroeconomic variables of the nation. It is a complement to monetary policy. Since the time of the "Keynesian Miracle" that pulled the global economy out of a hopeless depression, emphasis has heightened on the role of government intervention in the economy in saving it from total collapse in times when the market fails. One of such interventionist approaches adopted by the government is the use of public expenditures through its constitutional responsibility of annual budget formulation and execution.

Government expenditure refers to the totality of all the consumption/investment spending/transfers made by the government on behalf of the citizens in the economy to achieve some specified goals (Churchill, Yew & Ugur, 2015). Government expenditure has so many components such as education, health, defence and national security, social security etc. Also, each of these components is subdivided into recurrent and capital expenditures. Recurrent expenditures are those expenditures that are fixed to occur on year-to-year basis. It includes, but not limited to, the payment of salaries, wages, and earned allowances. On the other hand, capital expenditures are flexible in nature given the fact that they are basically long-term investment expenditures embarked upon by the government depending on the availability of funds and its ability to make adequate provision for recurrent expenditures.

Expenditure on human capital has also been recognized by the endogenous growth model as being the key to human capital accumulation and economic growth and development (Churchill, Yew & Ugur, 2015). Hence, education being one of the major components of human capital ought to be given adequate attention. It has been argued that Nigerian government, over the years, has performed abysmally poorly in its budgetary allocation to the sector despite the outrageous tuition fees paid by students in the various federal education institutions in the country, especially at the tertiary level. For instance, public expenditure on education in 1962 was 3.6% of GDP and 18.2% of all government expenditure but by 1998 it had dropped to about 2.3% of GDP and 14.2% of the total expenditures of all arms of government in Nigeria (Hinchliffe, 2002). Similarly, budgetary allocation to the education sector was 7.53% on the average between 2010 and 2014, it dropped to about 7.05% between 2015 and 2018 despite the

tremendous increase in the total budgets over the period (Ndujihe 2018). The highest approved national budget (N8.612 trillion) in Nigeria is recorded in year 2018 and only a paltry sum of about N605.8 billion which represents about 7.03% of the total budget was allocated to the education sector. These figures show that the government has not given the sector the kind of attention it deserves despite its critical role as the driver of the growth of modern economies. They are also in sharp contrast to UNESCO international benchmark of 15 to 20 percent of the total annual budget as contained in the EFA global monitoring report for 2000-2015 (Adedigba, 2017).

The purpose of this study is to empirically investigate the impact of public education expenditure on economic growth in Nigeria for the period, 1981-2016, identifying the aggregated and separate impacts of both the recurrent and capital components of public education expenditures for the period under consideration. Hence, one of the many ways that this study seeks to address this anomaly is to investigate which of capital and recurrent education expenditures impacts more on growth and make recommendations accordingly on how allocations should be made to the sector in more efficient ways so as to affect education output positively and significantly.

Studies have shown that improvement in human capital through public spending on education leads to a significant and positive impact on economic growth in Nigeria (Lawal and Wahab, 2011; Chude and Chude, 2013; Oyediran, Leye, Adedoyin and Oyewole, 2016). Their findings are also similar to the findings of Churchill, Yew & Ugur, (2015) who investigated the effect of public education and health expenditures across 31 countries using meta-analysis and Greg and Agboro (2014) who carried out a study on the effect of public expenditure on educational infrastructural facilities and economic growth in Nigeria using time series data as well as Torruan, Chiawa and Abur (2014) who examined the impact of public expenditure on tertiary education and economic growth in Nigeria using time series data covering the period, 1990-2011 and employing cointegration and error correction method of estimation. These authors also found a positive and significant impact of public education expenditure on economic growth for the periods studied as opposed to Urhie (2003) who found public spending on education to have both positive direct and indirect effects on economic growth in Nigeria.

Anyanwu and Erhijakpor (2007) investigated government expenditure on education and enrollment at the primary and secondary school levels with illustrations from the SANE countries of South Africa, Algeria, Nigeria and Egypt and found that government expenditure on education has a positive and significant impact on education attainment in countries studied. Guandong and Muturi (2016) in a study also found that public expenditure on productive areas such as infrastructure and security has a positive impact on growth while expenditure on unproductive social services has a negative effect on growth in South Sudan using panel data for the period, 2006-2014. A study Babatunde and Adefabi (2005) established a long-run relationship between education and economic growth while Odeleye (2012) and Obi and Obi, (2014) found that only recurrent expenditure on education has significant impact on economic growth in Nigeria.

Al-Samarai (2003), in a cross-country test study, using Botswana, Malawi and Uganda as a base found that the link between public spending and primary education access is weak as it was observed that public spending fell at the same time that primary school access was increasing though education services offered within the period studied changed greatly as equally reported. Robinson, Eravwoke and Ukavwe (2014) also studied the relationship between government expenditure and economic growth and found that government expenditure increases both local and foreign investments in Nigeria as supported by Edmund, Choong and

Lau (2017) who examined the relationship between government expenditure, efficiency and economic growth and discovered that raising government expenditure boosts economic growth in low income countries of Sub-Saharan Africa.

In the same vein, Okoro (2013) employed time series data of 32-year period (1980-2011) to examine the impact of government spending on Nigerian economic growth and found that there exists a positive long-run relationship between them. Yamugu (2006) employed Autoregressive Distributed Lag Model (ARDLM) technique to investigate the impact of fiscal policy on economic growth. The findings revealed, amongst other things, that productive government expenditures have positive relationship with growth. Francis and Lyare (2006) employed Cointegration and Vector Error Correction Models to investigate the causal relationship between education and development in three Caribbean countries based on time series annual data for the period, 1964-1998. The result showed that education causes development only in one of the countries studied but does not in the other two countries. This finding defies theoretical expectations with respect to the two countries.

Using time series data for the period, 1970-2007, and employing an Error Correction Method of estimation, Ajogwu (2009) assessed the effect of public expenditure on economic growth in Nigeria and discovered that most of the variables employed displayed no significant or strong relationship with economic growth in Nigeria. Ogundipe and Oluwatobi (2012) in their analysis of the impact of government recurrent and capital expenditures on economic growth in Nigeria based on Johansen's technique for the period, 1970-2009, found out that most components of total expenditure of the government impact negatively and insignificantly on economic growth save for education and health expenditures.

Al Gifari (2016) using time series data of 45-year sample size (1970-2014), found that government expenditure has a negative impact on Malaysian economy during the period studied. On their own, Maftaly, Symon, Aquilars and James (2014) empirically studied how government expenditure contributed to economic growth in East Africa using time series data from 1980 to 2010. The findings showed that while expenditure on health and defense has positive and significant effect on growth, those on education and agriculture did not.

Ahon (1999) found a negative and insignificant relationship between per pupil expenditure and the primary gross enrollment rate while a positive and statistically significant relationship was found between total education expenditure and economic growth using time series data. However, Foster and Henrekson (2001) conducted a panel study over a period of 26 years to discover the relationships existing between public expenditure and economic development. Their findings support the position that large public spending affects economic growth negatively. The results obtained by Pevcin (2003), Brady (2007), Pham (2009) and Maku (2009) corroborated their finding thereby recognizing large public expenditure as a threat to economic growth.

So far, the empirical literatures explored and presented have shown that there is no consensus among researchers on the effect of public spending, specifically spending on education, on economic growth. Some found a positive and statistically significant relationship between spending on education and economic growth while others found a negative and statistically insignificant relationship between the two variables. These contrasting results in the existing literature raise a serious question as to what could be responsible for the conflicting results. It has also been discovered that most of the works reviewed that studied the impact of public education expenditure and economic growth lumped total education expenditure (the sum of capital and recurrent expenditures) in Nigeria into their regression equations without

separating capital expenditure and recurrent expenditure to estimate their individual impacts on growth in the country and the strength and directions of such impacts. It is therefore, the prime target of this study to investigate the individual impacts of capital and recurrent education expenditures in Nigeria on economic growth in addition to the aggregated impact using time series data for the period, 1981-2014.

## 2. Method

In order to examine the impact of disaggregated capital and recurrent government expenditures on economic growth in Nigeria empirically, and to establish the direction and strength of such impact, this study followed the standard procedure of time series analysis. The requisite pre-estimation diagnoses were conducted on the time series data to ascertain their fitness to be used for estimation. First, the Augmented Dickey-Fuller (ADF) unit root test was conducted on the variables to determine their stationarity status and order of integration. This was followed by the Johansen's Cointegration test for the establishment of a long-run relationship among the variables.

### 2.1 Model Specification

$$1. \text{LogRGDP} = \alpha_0 + \alpha_1 \text{LogCEDUEXP} + \alpha_2 \text{LogINVI} + \alpha_3 \text{RIR} + \mu \quad \dots\dots\dots 1$$

$$2. \text{LogRGDP} = \lambda_0 + \lambda_1 \text{LogREDUEXP} + \lambda_2 \text{LogINVI} + \lambda_3 \text{RIR} + \mu \quad \dots\dots\dots 2$$

### 2.2 Estimation Procedure

The estimation method employed in this study is the Ordinary Least Squares estimation method (OLS) as also employed by the works of Greg and Agboro (2014), Alexander (1990), Devaraajan and Vinay (1993) and Bleaney et al (2001). This method is appropriate for the specified models because of its Best Linear Unbiased Estimators (BLUE) property.

### 2.3 Variables Description and Data Source

To investigate the relationship between capital and recurrent public education expenditures and economic growth in Nigeria which is the objective of this study, five variables were employed. These include Real Gross Domestic Product (RGDP) used as a proxy for economic growth, Capital Education Expenditure (CEDUEXP), Recurrent Education Expenditure (REDUEXP), Private Investment Expenditure (INVI) indexed at 2010 constant value and Real Interest Rate (RIR). All these variables except Real Interest Rate, were expressed in their log form. The variables were sourced from Central Bank of Nigeria (CBN) Annual Statistical Bulletin.

## 3. Results and Discussions

**Table 1. ADF Unit Test Result**

Variables	ADF test statistic	5% critical value	Order of integration
logINVI	-3.222505	-2.957110	I(1)
RIR	-4.338856	-3.587527	I(1)
logRGDP	-3.779125	-3.548490	I(1)
logCEDUEXP	-9.199851	-3.548490	I(1)
logREDUEXP	-5.518626	-3.562882	I(1)
logTEDUEXP	-3.548490	-3.362882	I(1)

Table 1 above shows pre-estimation tests of variable stationarity using Augmented Dickey-Fuller unit root test. The unit root test shows that the variables are only stationary after first differencing. This means that they are all integrated of order one.

**Table 2. Johansen's Co-integration Test Result**

N0 of co-integrating Equations	Trace Statistic	5% Critical Values
None *	148.6608	117.7082
At most 1 *	100.4977	88.80380
At most 2	55.20663	63.87610
At most 3	29.65677	42.91525
At most 4	11.93062	25.87211
At most 5	3.895184	12.51798

The table above (table 2) shows the result of Johansen's Co-integration test for long-run relationship. The co-integration test reveals a long-run equilibrium relationship among the variables.

**Table 3. Regression Result for Model One**

Variables	Coefficients	Std Errors	t-Statistics	P-values
Constant	7.817875	0.309915	25.22585	0.0000
LCEDUEXP	0.173398	0.017098	10.14165	0.0000
LINVI	0.258218	0.068886	3.748494	0.0007
RIR	0.011346	0.006680	1.695512	0.0991

**The std errors were improved using NW HAC**

The result of the first model estimating the impact of government capital education expenditure on Nigerian economy, as shown in the table above, shows a positive and statistically significant relationship between capital education expenditure (CEDUEXP) and economic growth (RGDP). The result shows that on the average, (controlling for other regressors), a percentage increase in capital education expenditure will grow Nigerian economy by about 0.17% as the probability value is 0.0000. It is also shown that while private investment (INVI) has a positive and statistically significant impact on Nigerian economy, real interest rate (RIR) has statistically insignificant impact on the economy. The  $R^2$  and the Adjusted  $R^2$  which are measures of goodness of fit of the estimated equation show that about 90% and 89% respectively of the total variation in RGDP were explained by the regressors included in the equation. The F-statistic of about 96% with a probability value of 0.000000, show that, when considered as a whole, all the regressors are statistically significant.

**Table 4. Regression Result for Model Two**

Variables	Coefficients	Std errors	t-statistics	P-values
Constant	8.716663	0.210514	41.40664	0.0000
LINVI	0.303850	0.051176	5.937312	0.0000
RIR	0.008231	0.005320	1.547234	0.1316
LREDUEXP	0.129553	0.009542	13.57739	0.0000

**The std errors were improved using NW HAC**

The second model estimates the impact of recurrent education expenditure (REDUEXP), on economic growth in Nigeria.

\The result suggests a positive and statistically significant relationship between economic growth and recurrent education expenditure in Nigeria for the period under review. It shows that increasing recurrent education expenditure by 1% will, on the average grow Nigerian economy by about 0.13% when other regressors are controlled for. Private investment (INVI) was also found to be statistically significant and impacts positively on Nigerian economy while real interest rate (RIR) had a positive but insignificant impact on the economy. The positive relationship of real interest rate with RGDP agitates the mind when placed side by side with the existing economic theories concerning the two variables. The sign of the real interest rate variable opens a door for an interesting academic investigation although the works of Tomas (2017), Blanchard (1984), and Del (2018) unanimously but separately concluded that though the relationship between interest rate and RGDP is inverse in the short-run, the long-run relationship can be positive. Also, given the fact that RGDP is adjusted for inflation, it could be argued that interest rate positively affects RGDP indirectly via the stabilization of inflation rate in an economy.

**Table 5. Granger Causality Test Result**

Null Hypotheses	F-statistics	Probability Values
1. LogREDUEXP doesn't Granger cause LogCEDUEXP	2.58617	0.0926
2. LogCEDUEXP doesn't Granger cause LogREDUEXP	2.62053	0.0899
3. LogRGDP doesn't Granger cause LogCEDUEXP	0.38696	0.6826
4. LogCEDUEXP doesn't Granger cause LogRGDP	3.83271	0.0333
5. LogRGDP doesn't Granger cause LogREDUEXP	0.33867	0.7155
6. LogREEDUEXP doesn't Granger cause LogRGDP	1.55266	0.2288

The Granger Causality test ran revealed that while capital education expenditure granger causes economic growth in Nigeria, recurrent education expenditure does not, thereby further buttressing the result that capital education expenditure has greater impact on economic growth in Nigeria than its recurrent counterpart.

#### **4. Conclusion and Policy Recommendation**

The focus of this research work is to empirically investigate the impact of capital and recurrent public education expenditures on Nigerian economic growth using time series data of 1981-2016. The objective is to ascertain which of the education expenditure components has a stronger impact on the nation's economy to make for proper and more efficient resource allocation to the sector. The regression results show that both Capital and Recurrent education expenditures affect Nigerian economic growth positively and significantly with a common P-value of 0.0000. This implies that a percentage increase in capital and recurrent education expenditures will, on the average, lead to about 17% and 13% increases in the nation's real gross domestic product respectively when other factors are controlled for. It was further shown that Capital education expenditure exerts stronger influence on Nigerian economy than recurrent education expenditure given their individual coefficients of about 17% and 13% respectively. Also, private investment expenditure and real interest rate were included in the estimated equations as control variables. It was found that while private investment expenditure showed a positive and statistically significant impact on RGDP in the estimated equations, real interest

rate showed positive but statistically insignificant impact on RGDP in Nigeria within the period under investigation.

Therefore, based on the findings, this work recommends that Nigerian government at all levels should pay more attention to capital expenditure when making budgetary allocation to the education sector. Paying more attention to such capital projects like good class room blocks, conducive learning environment, constant electricity supply, adequate equipment of practical laboratories, investment in research and development and standard hostel accommodation among other things, will both in the short and long-runs contribute to the growth of the nation's economy.

In the short-run, the contribution comes from the employment and income generated from such capital investments in the sector while the long-run contribution comes basically from the high-quality human capital that will be produced through such investment over time. This is true given the fact that economies all over the world have gradually transited from resource-based growth to knowledge-based growth. The Granger Causality test result further stresses this point as it showed that while capital education expenditure granger causes economic growth in Nigeria, its recurrent counterpart does not. The study concludes that the two components of education expenditure have positive and significant impact on economic growth in Nigeria though capital expenditure component exerts stronger influence on the economy than its recurrent counterpart.

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