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Abiodun O. Ayeni

University of Ibadan, Nigeria

Osagie F. Omobude

University of Ibadan, Nigeria, frankomobude@yahoo.com

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Educational Expenditure and Economic Growth Nexus in Nigeria (1987-2016)

Abiodun O. Ayeni and Osagie F. Omobude*

Department of Educational Management, University of Ibadan, Nigeria

ABSTRACT

This study empirically investigated educational expenditure and economic growth nexus in Nigeria using secondary and times series data from 1987 to 2016, sourced from the Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS) and other agencies and sources. Relevant statistical tools were employed in exploring the relationships between these variables. The random characteristics of the variables were tested using the Augmented Dickey Fuller (ADF) technique. The links among educational expenditure, education sectoral output and economic growth were tested via the Autoregressive Distributed Lag (ARDL) and bound test approach developed by Pesaran and Shin. Four research hypotheses were tested. The literature reviewed guided the interpretation of the results. The population for the study was Nigeria. The findings show that educational expenditure was inconsistent with education sectoral output. On the other hand, while recurrent educational expenditure exhibited significant relationship with real gross domestic product (economic growth), in contrast, capital expenditure on education was insignificant. Generally, the study concluded that the impact of educational expenditure on real GDP is mainly a function of the expenditure type in Nigeria. This is premised on the fact that only recurrent educational expenditure had both positive and significant long-run impact on economic growth within the period of study. The study attributed these findings to the fact that educational expenditure within the period of study was distorted by extraneous factors such as policy mismatch, inadequate funding, less priority placed on capital expenditure, fund misappropriation, etc. The study recommends that in line with international standards, the educational system of Nigeria requires an institutional transformation in terms of policy formulation, implementation and monitoring as well as funding. Also, priority must be given to capital expenditures to translate to economic growth.

Keywords: Recurrent expenditure, capital expenditure, education sectoral output, economic growth, autoregressive distributed lag (ARDL), bound test.

*Corresponding author: frankomobude@yahoo.com / +234-8038581071

1 INTRODUCTION

The National Bureau of Statistics (NBS) defined expenditure as an outflow of resources from the government to other sectors of the economy, whether required or unrequired (NBS, 2009). It is divided into recurrent and capital expenditures. Recurrent expenditures are payments for non-repayable transactions within one year, whereas capital expenditures are payments for non-financial assets used in production process for more than one year (NBS, 2009).

According to Schmidt (2003), recurrent expenditure refers to expenses on goods and services

consumed within the current year in order to sustain the production of educational services while capital expenditure according to Organization for Economic Cooperation and Development (OECD), refers to the value of educational capital acquired or created during a particular year. This is the amount of capital formation regardless of whether the capital outlay was financed from current revenue or borrowing which includes expenditures on construction, renovation, major repairs of building and replacement of equipment (OECD, 2002). The sum total of both recurrent expenditure and capital expenditure is referred to as total expenditure as usually computed in the statistical bulletin of the Central Bank of Nigeria (CBN).

The United Nations Educational, Scientific and Cultural Organization (UNESCO) classification of 1967 as adapted by Hallak (1969), conceptualized educational expenditure by nature as comprising of recurrent, capital and debt service. According to Alfred Marshall, “the most valuable of all capital is that invested in human beings” (Becker, 1994). Schultz (1961), Becker (1975) and Mincer (1970) were famous in their view of human capital “as investments made on human persons in form of education, training, and health among others which in turn boost the productive capacity of the individual for economic development”. In the view of Schumpeter (1934), economic growth means a gradual and steady change in the long run which comes about by the gradual increase in investment and savings.

Samuelson and Nordhaus (2002) described economic growth as the expansion of a country’s potential gross domestic product (GDP) or national output or the outward shift of a country’s production possibility curve. Jhingan (2003) defined growth as a quantitative sustained increase in a country’s per capita output or income accompanied by expansion in its labor force, consumption, capital and volume of trade. According to Todaro and Smith (2011) the sources of economic progress can be traced to a variety of factors. By and large, investment that improve the quality of existing physical and human resources, increases the quality of these same productive resources through invention, innovation and technological progress have been and will continue to be the primary factor in stimulating economic growth in any society. Titus, Obele and Oyaba (2003) opined that national development may be difficult without the deployment of qualitative and quantitative resources into the educational sub-sector. Also, that government funding has been unstable, unpredictable and was only a fraction of the nation's budget. It was further noted that education is a growing sector in Nigeria, and that there is a correlation between education and national development.

Myers (1964) maintained that the most obvious way of developing human capital is formal education, beginning with first level education, continuing with various forms of post primary education and post-secondary education. The emergence of the consciousness on educational investment and expenditure is attributable to the report of the federal advisory committee on technical education and industrial training of 1957 and the Ashby commission of 1960 among other national efforts. This set the pace of the need to develop human capital for the overall socio-economic growth in Nigeria. Emphasis was on “Investment in Education” which led to the increase in the number of universities available in Nigeria. The former was to advice the minister of education on the development and training including the common training required to meet industrial and commercial needs.

In Nigeria, the sources of education investment funds are mainly public in nature. One of the

approaches the government adopts in financing education is the annual budgetary allocation to the sector that are distributed as subvention or grants to the different levels of education. These grants or subventions to educational institutions are made through the respective education ministry of the levels of government by the coordinating agency of education like the National Universities Commission (NUC), Universal Basic Education Board (UBEB) and Post Primary Schools Board (PPSB) among others. Adesina (1980) noted that the implications of Nigeria government assuming total financing of education system were far reaching. It means that the amount of education to be provided in a given year would solely be determined by the amount government is willing and able to give to education. Furthermore, the volume of education has to be drastically pruned down anytime government declares its inability to meet the financial requirements of the system. For instance, in the first national rolling plan document (1990-1992) it was pointed out that the sharp fall in federal government subvention especially to the universities from which they have never recovered since 1984 explains their present financial predicament with regard to the implementation of their capital projects.

The structure of Nigeria government expenditure can broadly be categorized into capital and recurrent expenditure. The recurrent expenditure is government expenses on administration such as wages, salaries, interest on loans, maintenance etc., whereas capital expenditure are expenses on capital projects like roads, health, education, electricity generation etc. One of the main purposes of government spending is to provide infrastructural facilities. The general view is that public expenditure (either recurrent or capital), notably on social (education) and economic infrastructure can be growth enhancing. Although the financing of such expenditure may also be counter productive owing to extraneous factors inherent in developing economies like Nigeria.

1.1 Educational Expenditure and Sectoral Output in Nigeria (1987-2016)

According to data reported by the central bank of Nigeria (several volumes), the trend of educational expenditure and sectoral output from 1987-2016 in Nigeria has been cascading. This consequential effect is attributable to a number of issues among which include; poor funding, misappropriation, leakages, industrial action and regulatory capture. With particular reference to year 2007 which had an allocation totaling ₦179.6 billion but due to a 5.1% fall in federal government aggregate expenditure, both recurrent and capital expenditure on education fell from ₦164 billion and ₦48.8 billion in 2008 to ₦137.1 billion and ₦43.4 billion in 2009, respectively. However, outlay on education increased by 102.6% (₦87.7 billion) in 2010. The education sector was plagued by instability in 2011 due to industrial actions, closure of illegal universities as well as accreditation crisis in some tertiary institutions (CBN, 2011). The Education Trust Fund (ETF) act was amended to be Tertiary Education Trust Fund (TETFUND) while nine federal universities were established. Educational expenditure however fell in terms of capital expenditure while recurrent expenditure rose to ₦335.8 billion. The 1-6-3-3-4 replaced the 6-3-3-4 system of education with a new secondary school curriculum by the National Educational Research and Development Council which incorporated entrepreneurial skills to enhance job creation. A total of ₦273.3 billion and ₦295.4 billion was allocated in 2012 and 2013 respectively, in year 2014, recurrent expenditure on education was ₦243.8 billion while capital expenditure fell from ₦148.2 billion in 2013 to ₦40.8 billion in 2014. The CBN economic report for the first half of 2016 shows that recurrent and capital expenditures on education were ₦160.03 billion and ₦30.06 billion, respectively while sectoral output stood at ₦644.44 billion (CBN, 1987 – 2016; CBN, 2017). From the foregoing, it is pertinent

to state that increase in educational expenditure has not been sustained over time. Hence, educational output could have been undermined.

1.2 Statement of the Problem

Empirical findings on the relationship between educational expenditure in form of recurrent, capital or total expenditure and economic growth in Nigeria has been divergent (mixed) and therefore constituted policy problems. In an ideal situation, educational expenditures move positively with economic growth. The Nigerian case seems somewhat different given the mixed empirical results. By implication, findings have been complicated while policy recommendations must not be used without caution. To this effect, recognizing the role of education in the economies of the developed nations, the Nigerian government had made effort to improve her human resources through expenditure on the provision of free education services, scholarships, payment of bursaries, provision of more schools and increased funding in terms of capital and recurrent expenditure as highlighted above. However, this effort seems not to have yielded the desired outcome as reflected in the reviewed empirics. This is worrisome and hence, the nexus between educational expenditure and economic growth in Nigeria becomes somewhat blur and therefore needs more revelation. The present study put forward the assertion that; the relationship between educational expenditure and economic growth in Nigeria is still blur. Hence, a further insight on the subject matter is imperative. To this effect, this study set out to reexamine the link between these variables, with educational sectoral output as dependent variable on one hand and economic growth (real GDP) on the other hand. This will be achieved through the test of four hypotheses viz:

Hypothesis 1 (h_1) *There is no significant relationship between recurrent educational expenditure and economic growth in Nigeria.*

Hypothesis 2 (h_2). *There is no significant relationship between capital expenditure on education and economic growth in Nigeria.*

Hypothesis 3 (h_3) *There is no significant relationship between recurrent educational expenditure and education sectoral output in Nigeria*

Hypothesis 4 (h_4) *There is no significant relationship between capital expenditure on education and education sectoral output in Nigeria*

2 CONCEPTUAL REVIEW

2.1 Education Expenditure as a form of Human Capital.

Hallak (1969) adopting UNESCO's 1967 classification, conceptualized educational expenditure by nature as comprising of recurrent, capital and debt service. It was further exposed that it is theoretically possible to estimate the amount of expenditure, i.e., the money cost, taking care, of course, to avoid any duplication. However, its practical application comes up with a number of difficulties. This stems from the need to ascertain the type, level and nature of expenditure. According to Alfred Marshall, "the most valuable of all capital is that invested in human beings." In theory, education expenditure, school enrollment and educational attainment are known basic

proxies for human capital. Human capital itself refers to investment in human persons that improves productivity and growth. Schultz (1961) conceptualized education expenditure as an investment. From the foregoing, it is obvious that both school enrollment and educational attainment are greatly influenced by educational expenditure.

In conceptualizing human capital broadly and educational expenditure specifically, the works of Theodore Schultz, Gary Becker and Jacob Mincer among others remains fundamental in their view of human capital “as investments made on human persons in form of education, training, health among others which in turn boost the productive capacity of the individual for economic development”. Mincer (1970), however stressed that a primary motivation for schooling was developing the general skills of individuals and therefore, that it made sense to measure human capital by the amount of schooling completed by individuals (school attainment) (Schultz, 1960; Schultz, 1961; Schultz, 1972; Becker, 1962; Mincer, 1970; Mincer, 1974).

2.2 The Concept of Economic Growth

Todaro and Smith (2011) opined that the sources of economic progress can be traced to a variety of factors. By and large, investment that improve the quality of existing physical and human resources, increases the quality of these same productive resources through invention, innovation and technological progress have been and will continue to be the primary factor in stimulating economic growth in any society. Samuelson and Nordhaus (2002) viewed economic growth as the expansion of a country’s potential GDP or national output or the outward shift of a country’s production possibility curve. Schumpeter (1934) saw economic growth as a gradual and steady change in the long run which comes about by the gradual increase in investment and savings. Milton Friedman defined growth as an expansion of the system in one or more dimensions without change in its structure. According to Haller (2012), economic growth in a wider sense involves the increase of the gross domestic product, expressed in both absolute and relative size, encompassing also the structural modifications of the economy.

From the above premise, it is seen that economic growth is systemic and therefore is a function of investment in either physical or human capital. Hence, for an economy to grow, deliberate action must be taken to invest in both physical and human capital.

2.3 Growth Mechanisms

The study by Zipfel (2004) and Romer (2007) explained that economic growth theorists from the era of Adam Smith till date have discussed plethora of models (classical, neoclassical and endogenous) on how to stimulate and sustain economic growth. However, the fundamental models have remained the same with minor variations. At least on the factors of production; land, labor, and capital generally construed as physical capital (Zipfel, 2004; Romer, 2007). The contemporary growth theories (endogenous) however stressed the importance of technology (research and development) embedded in human person as a form of capital termed human capital. Taking an excerpt from the work of Hanusek and Wobmann (2007), there are at least three mechanisms through which education may affect economic growth. First, education increases the human capital inherent in the labor force, which increases labor productivity and thus transitional growth towards a higher equilibrium level of output (as in augmented neoclassical growth theories, Mankiw,

Romer and Weil (1992). Second, education may increase the innovative capacity of the economy, and the new knowledge on new technologies, products and processes which promotes growth (as in the theories of endogenous growth by Lucas (1988), Romer (1990), Aghion and Howitt (1998). Thirdly, education may facilitate the diffusion and transmission of knowledge needed to understand and process new information and to successfully implement new technologies devised by others, which again promotes economic growth as detailed in Nelson and Phelps (1966).

2.4 Educational Expenditure and Economic Growth in Nigeria

A glossary of the Central Bank of Nigeria (CBN) statistical bulletin, several volumes, reveals that recurrent expenditure on education has been upward trending till date. However, studies by Adebayo (2005), Imoughele and Ismaila (2013) and others showed that when these expenditures were regressed on the GDP in Nigeria, some positive relationships were found but not indicative enough to say emphatically that recurrent educational expenditure in Nigeria had significantly promoted economic growth. See CBN (2013), CBN (2014), CBN (2015), Adebayo (2005), Imoughele and Ismaila (2013) and Oluwatobi and Ogunrinola (2011).

Capital expenditure on education and growth on the other hand has fallen short behind recurrent educational expenditure in terms of the ratio. This is obvious from a critical study of the CBN statistical bulletin, 2015 and annual reports, 1987 to 2015. This is evident and was/is attributable to monthly salaries paid to teaching and non-teaching staff in Nigeria schools, especially at the tertiary level of education and sundry expenses. The payments of these current expenditures were observed to be prioritized against capital expenditure (CBN, 2017; NBS, 2017). For instance, the number of capital interventions through the Universal Basic Education Commission (UBEC), Tertiary Education Trust Fund (TETFUND), etc., made by government or its agencies compared with the monthly payment and running cost was partially skewed in favor of recurrent expenditure (CBN, 2013; CBN, 2014; CBN, 2015). These may be a major factor accounting for the insignificant relations which several authors such as Adebayo (2005) as well as Oluwatobi and Ogunrinola (2011) found between capital expenditure and economic growth in Nigeria.

Total expenditure on education and economic growth in Nigeria, though has improved (increased) over the years, but still behind the 26% UNESCO bench mark and as such the expected educational impact on economic transformation for growth and development has been a mirage. The highest ever educational expenditure in Nigeria was 13% in 2016. However, considering the impact of educational investment on the economic growth and development of countries such as South Korea, Finland, Hong Kong, etc., the link between educational expenditure (investment) and economic growth, has continually gained prominence and therefore raised/raises questions on whether educational expenditure actually promoted/promotes economic growth in Nigeria or not.

2.5 Empirical Review

2.5.1 Recurrent Educational Expenditure and Economic Growth in Nigeria

Odeleye (2012) examined the relationship between education and economic growth in Nigeria using a comparative analytical approach. The findings showed that only recurrent expenditure had significant effect on economic growth. Obi and Obi (2014) employed time series data from 1981 to 2012, using the Johansen's co-integration and ordinary least square (OLS) econometric

techniques to analyze the relationship between gross domestic product (GDP) and recurrent education expenditure. Findings indicated that though a positive relationship subsists between education expenditure and economic growth, but a long-run relationship does not exist over the period under study. Oluwatobi and Ogunrinola (2011) studied the impact of government recurrent expenditure on education and its effect on economic growth in Nigeria. The study employed the augmented Solow model and found a positive relationship between recurrent expenditure and growth (real output).

Edeme and Nkalu (2016) employing a multiple regression approach, found that recurrent expenditure on education crowds in/crowds out human capital development in Nigeria. Ojewumi and Oladimeji (2016) examined the effect of government funding on the growth of education in Nigeria (1981-2013) using the multiple regression model. The major finding showed that the impact of recurrent expenditure on educational growth was negative. The study therefore recommended that the high level of corruption prevalent in the educational sector should be checked to ensure that funds meant for education in the sector are judiciously appropriated. Modebe, Okafor, Onwumere and Ibe (2012) used a disaggregated approach to examine the impact of government recurrent expenditure on economic growth in Nigeria from 1987-2010. The study adopted a three-variable multiple regression model. Results revealed that recurrent expenditure had a positive but non-significant impact on economic growth. The study recommended an increase in private sector investment which seems more efficient. Imoughele and Ismaila (2013) examined the effect of public educational expenditure on Nigeria's economic growth using annual time series data (1980 - 2010) and the Johansen co-integration, unit root test as well as error correction model. The empirical results showed that there is a long-run relationship between gross domestic product and educational investment. The study found out that recurrent expenditure had direct and insignificant effect on Nigeria's economic growth. The policy significance of the study was that public investment in education sector is imperative and should be complemented with private investment. Oluwatobi and Ogunrinola (2011) examined the impact of government recurrent expenditures on education and health in Nigeria and its effect on economic growth using the augmented Solow model. The findings revealed a positive relationship between government recurrent expenditure on human capital development and the level of real output. It was recommended that appropriate channeling of the nation's capital expenditure on education and health will promote economic growth. Ohwofasa, Obeh and Atumah (2012) investigated the relationship between government recurrent and capital expenditure on the education sector and economic growth in Nigeria, using the Johansen co-integration technique and error correction model. The co-integration results showed a short-run negative and long-run positive relationships between the variables. The paper therefore recommended among other things, improvement in government expenditure in educational sector especially on the capital component to boost economic growth in Nigeria. Ifionu and Nteegah (2013) examined the impact of government investments in education on economic growth in Nigeria from 1981-2012. Employing the ordinary least square technique, the paper found that government recurrent expenditure on education had significant implications on economic growth. It recommended an increase in government budgetary allocation to the education sector from the present less than 15% to the United Nations Development Programme /UNESCO recommendation of 26% allocation to the sector, improvement in the welfare of educational staff and regular monitoring of funds and services rendered in the sector to ensure improved standards as possible ways of striving for education growth as well as economic growth in Nigeria.

2.5.2 Capital Educational Expenditure and Economic Growth in Nigeria

Omojimate (2011) examined issues dealing with the effectiveness of the Nigerian education sector in meeting the human capital needed for economic development in an era of reforms. The study revealed that the sector lags behind in all the indicators used to assess its effectiveness. The paper recommended major reforms in the sector including increased funding, overhaul of school curricula and introduction of a new incentive structure for school workers. Torruam, Chiawa and Abur (2014) observed that the general view on recurrent and capital expenditure is that it can be growth enhancing. The study used co-integration and error correction technique to check the impact of public expenditure on tertiary education and economic growth in Nigeria. It was concluded that public expenditure on tertiary education has positive impact on economic growth in Nigeria. It was recommended that government and private sectors should partner by mobilizing resources to furnish tertiary institutions and equip them with adequate facilities in order to enhance tertiary education development for sustainable economic growth. Dauda (2009) empirically investigated the relationship between investment in education and economic growth in Nigeria, using annual time series data from 1977 to 2007. The paper employed Johansen co-integration technique and error correction methodology. Empirical results indicated that there was, indeed a long-run relationship between investment in education and economic growth and as such, policy makers were advised to enhance educational investment in order to accelerate growth.

An augmented Solow model study by Oluwatobi and Ogunrinola (2011) on the impact of government capital expenditure on education and its effect on economic growth revealed a negative relationship between capital expenditure and growth (real output) in Nigeria. Ohwofasa, Obek and Atumah (2012) investigated the relationship between government recurrent and capital expenditure on the education sector and economic growth in Nigeria. The study employed time series data spanning 1986 to 2011, using the Johansen co-integration technique and error correction model. The co-integration result showed short-run negative and long-run positive relationships between the variables. On the other hand, capital expenditure on education had a negative impact on economic growth within the period. The paper therefore recommended among other things, improvement in government expenditure in educational sector especially on the capital component to boost economic growth in Nigeria. Modebe, et al (2012) examined the impact of government expenditure on economic growth in Nigeria from 1987-2010 using a three variable multiple regression model and found that capital expenditure exhibited a negative and non-significant impact on economic growth. The study recommended an increase in private sector investment which seems more efficient. Ifionu and Nteegah (2013) studied the impact of government investments in education on economic growth in Nigeria from 1981-2012 using the OLS technique and found that government capital expenditure on education had significant implications on economic growth. The authors recommended an increase in government budgetary allocation to the education sector up to the United Nation Development Program (UNDP)/UNESCO 26% recommendation, improvement in the welfare of educational staff and regular monitoring of funds and services rendered in the sector. Imoughele and Ismaila (2013) examined the effect of public educational expenditure proxied as recurrent and capital educational expenditure on Nigeria's economic growth using annual time series data from 1980 to 2010. The study employed Johansen co-integration, unit root test and error correction methodology. The empirical results showed that there is a long run relationship between gross domestic product and

educational investment. Also, the study found that capital educational expenditure had direct and insignificant effect on Nigeria's economic growth.

2.6 Summary of the Empirical Findings/Expected Contribution to Literature

The reviewed scholarly works investigated the link between educational expenditures and real GDP while employing related variables which includes recurrent, capital and total expenditures on education and real GDP. The empirical results were mixed and thus divergent. Towards a consensus, the studies recommended an increase in budgetary allocation/funding among others. However, it is pertinent to state that expenditures by rule of thumb should be immediately felt through its contribution to own sectoral output. Thus, from the above summary, some key questions that comes to mind, remains fundamental pathway which the previous studies did not consider. Therefore, answering questions as to whether these expenditures translate to growth of the immediate education sectoral output or not, before regressing it (expenditure) on real GDP (economic growth) becomes imperative. By implication, inferences from these findings may constitute policy issues if used without caution. As an improvement on previous studies, the present study seeks to contribute to existing literature by examining the link between these forms of educational expenditures (recurrent and capital) while incorporating educational sectoral output (proxied as education sectoral GDP) as a new variable, as well as reexamining its effect on economic growth (proxied by real GDP).

2.7 Theoretical Framework

Capital and labor remain the core factor inputs for production towards economic growth. For these inputs to be highly productive, well trained and skillful labors (workers) are required. This can be achieved through investment in education. According to the famous human capital theory by Schultz (1960), Schultz (1961), Schultz (1972), Becker (1962) as further detailed in Mincer (1970) as well as Psacharopoulos (1994), Psacharopoulos and Patrinos (2002), Psacharopoulos and Patrinos (2004) and Psacharopoulos (2006), education investment (investment in humans) produces returns like investment in physical capital. This is due to knowledge and spillover effect of education as demonstrated in the work of Nelson and Phelps (1966). The study by Mankiw, Romer and Weil (1992) which is an augmented Solow growth model asserted that human capital is endogenously determined in an economy. Consequently, to grow an economy, the human capital should be enhanced through adequate investment.

3 METHODOLOGY, MODEL AND DATA SOURCE

3.1 Research Design

The study adopted the ex post facto research design which allows a causal link between the dependent and independent variables. This was used to examine the nexus between educational expenditure (in terms of recurrent and capital investment), education sectoral growth and economic growth without undue influence or manipulations of the variables (data) which were already in existence.

3.2 Model Formulation

To bring about economic growth, factors of production like capital and labor are employed. However, the efficient use of these inputs for productivity requires that workers are well trained and skillful. These training and skills are acquired through investment in education. Economist view education as both a consumer and capital good. From the angle of a capital good, education can be useful in growth and development of an economy, since it raises the individual's as well as aggregate productivity. Thus, the human capital theory opined that; investment in human capital is as important (if not more) as physical capital in production process. See Schultz, (1960), Schultz (1961), Schultz (1972), Becker (1962), Mincer (1970), Psacharopoulos (1994), Psacharopoulos and Patrinos (2002) and Psacharopoulos (2006). Mawkin, et al. (1992) introduced the augmented Solow growth model in which human capital was seen as endogenous in the Solow production function. The model specification in section 3.3 below, is conceived and built on the above framework.

3.3. Model Specification (Educational Expenditure and Economic Growth)

Following the augmented Solow model by Mawkin, Romer and Weil (1992) and the Keynesian postulate, a linear regression model is set up as below:

$$RGDP = F(REDX, CEDX) + E_t \dots\dots\dots 1$$

Where; *RGDP* = real gross domestic product
REDX = recurrent educational expenditure
CEDX = capital educational expenditure
E_t = error term (stochastic variable)

In a more explicit functional form it implies that;

$$RGDP = b_0 + b_1REDX + b_2CEDX + E_t \dots\dots\dots 2$$

Where; *b₀* = slope intercept,
b₁ = coefficient of recurrent educational expenditure,
b₂ = coefficient of capital educational expenditure
 A priori expectations; *b₁, b₂* > 0

For educational expenditure and education sectoral output:

$$EGDP = f(REDX, CEDX) + E_t \dots\dots\dots 1$$

In a more explicit specification equation 1
 ⇒ *EGDP* = *b₀* + *b₁**REDX* + *b₂**CEDX* + *E_t*.....2

Where *EGDP* represents education sectoral output
 Where; *b₀* = slope intercept
b₁ = coefficient of recurrent educational expenditure

b_2 = coefficient of capital educational expenditure

A priori expectations; $b_1, b_2 > 0$

3.4 Technique for Data Analysis

The time series data were analyzed using unit root test, cointegration and autoregressive distributed lag-bound (ARDL) test done with EViews (7&9) econometric software application packages.

3.5 Validity and Reliability of Econometric Technique

Because of the time series nature of the data and the fact that, educational expenditure and economic growth take different value over time, the variables (data) were subjected to unit root testing in line with the Augmented Dickey Fuller (ADF) technique to ascertain their stationarity. Several tests were further conducted to determine whether there exist long-run relationships between the forms of educational expenditure and economic growth in Nigeria within the period under study. The model was analyzed using ARDL (bound test) which is suitable when variables are not integrated of the same orders as in this case in table 1 below. In the process, several diagnostics test (F-stat, t-test, R-squared, Durbin-Watson) were carried out to assess the link between educational expenditure and economic growth in Nigeria.

4 RESULTS AND DISCUSSION

4.1 Unit Root Test

Table 1: Unit root Test Result for all Variables (REDX, CEDX, and RGDP)

Variables	Level	First difference	Order of integration
REDX	0.0303	-1.104707	I(0)
CEDX	0.615737	-8.473964	I(1)
EGDP	2.766020	-6.784045	I(1)
RGDP	1.78831	-6.874843	I(1)

Source; Authors' Computation (2017) using EViews 7

Table 1 above presents the result of unit root testing according to the ADF technique. The result shows that the variables employed in the study are non-stationary at levels (with coefficients of 0.615737 and 2.766020) but integrated of order one I (1) except recurrent educational expenditure (REDX) which was integrated of order zero I(0), given a coefficient of 0.0303. However, having been subjected to first differences, they became stationary and thus could be employed in further statistical analysis to have a non-spurious regression.

4.2 Research Hypothesis

Hypothesis 1 (h_1): *There is no significant relationship between re-current educational expenditure and economic growth in Nigeria.*

Table 2: ARDL short-run result for educational expenditure and economic growth

VARIABLES	COEFFICIENT	STD. ERROR	P-VALUE
CONST.	9698031	11017221	0.4716
D(CEDX)	9.429797	16.41274	0.6236
D((CEDX)(-1))	-171.7235	19.17827	0.0122
D(REDX)	41.64549	5.004450	0.01141
D((REDX)(-1))	-25.86048	117.1693	0.8458
R-SQUARED = 0.999484			
ADJ. R-SQUARED = 0.996644			
F-STAT. = 351.9897			
D-W = 2.008329			

Akaike Information Criterion (AIC) was used to select automatic lag length of 2 for the dynamic regressors of the model. *Source: Authors' Computation (2017) using EViews 9*

Table 3: ARDL Long -run result for educational expenditure and economic growth.

VARIABLES	COEFFICIENT	STD. ERROR	P-VALUE
CONST.	9698031	11017221	0.4716
CEDX	9.429797	16.412274	0.6236
REDX	41.64549	5.004450	0.01141
REDX(-1)	12.70426	117.1693	0.8458
R-SQUARED = 0.999981			
ADJ. R-SQUARED = 0.999875			
F-STAT. = 9488.388			
D-W = 2.008329			

Akaike Information Criterion (AIC) was used to select automatic lag length of 2 for the dynamic regressors of the model. *Source: Authors' Computation (2017) using EViews 9*

Table 2 and 3 above presents the short and long-run autoregressive distributed lag results for the variables in the model. The result shows that 99.9% variation in economic growth is due to variations in the independent variables (recurrent and capital educational expenditures). The F-statistics (9488.388) also shows that in both short and long-run, recurrent and capital educational expenditure have joint influence on economic growth. The Durbin-Watson (d) statistics (2.008329) reveals no autocorrelation. This shows that the model was well fitted.

The result further revealed that in the short and long-run respectively, recurrent educational expenditure had both positive and significant impact on real GDP (P -value of 0.01141 in each case), while capital expenditure was found to be positive but insignificant (P -value of 0.6236 in each case). This result is not a surprise, given several empirical findings on Nigeria, among which include those of Imoughle and Ismaila (2013) and Ayanwu et al (2015). The reason adduced for this result, is that over the period under study, recurrent expenditure was prioritized over capital expenditure on education.

Table 4: Bound testing approach to long-run cointegration of educational expenditure and economic growth.

Variables Examined	Lags	F-Stat.	10% Critical bound		5% Critical bound		2.5% Critical bound		1% Critical bound	
			Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound
REDX CEDX RGDP	2	78.77573	3.17	4.14	3.79	4.85	4.41	5.52	5.15	6.36

Notes: The lag structure was selected based on the Schwartz criterion. The bounds critical values are obtained from the unrestricted intercept and no trend for one regressor (Pesaran et al., 2001).

Akaike Information Criterion (AIC) was used to select automatic lag length of 2 for the dynamic regressors of the model. *Source: Authors' Computation (2017) using EViews 9*

Table 4 above reveals the results for the bound test. The null hypothesis of the model is that there is no long run relationship between economic growth and the included regressors (REDX, CEDX). The F-statistics value (78.77537) from the table is higher than the values of the distribution at the upper bounds of all the level of significance tested, hence, the independent variables exert long run impact on economic growth in Nigeria.

Based on the results from Tables 2, 3 and 4 above, the hypothesis that there is no significant relationship between recurrent educational expenditure and economic growth in Nigeria is rejected. Hence the alternative hypothesis of a significant relationship between recurrent educational expenditure and economic growth is accepted.

Hypothesis 2 (h_2). *There is no significant relationship between capital expenditure on education and economic growth in Nigeria.*

Based on the insignificant probability in column 4 of tables 2 and 3 above, this hypothesis that there is no significant relationship between capital expenditure on education and economic in Nigeria is accepted. This finding is in line with those of Ohwofasa, Obeh and Atumah (2012), Modebe et al. (2012) and Oladimeji (2016). The finding is however at variance with Dauda (2009) and Torruam et al. (2014).

Hypothesis 3 (h_3) *There is no significant relationship between recurrent educational expenditure and education sectoral output in Nigeria*

Hypothesis 4 (h_4) *There is no significant relationship between capital expenditure on education and education sectoral output in Nigeria*

Table 5: ARDL Long-run result for educational expenditure (recurrent and capital) and education sectoral output.

VARIABLES	COEFFICIENT	STD. ERROR	P-VALUE
CONST.	39722.93	94436.91	0.7149
REDX	-0.165082	0.301054	0.6385
CEDX	0.001219	5.004450	0.9972
R-SQUARED =	0.999489		
ADJ. R-SQUARED =	0.996626		
F-STAT. =	15892.93		
D-W =	2.529832		

Akaike Information Criterion (AIC) was used to select automatic lag length of 2 for the dynamic regressors of the model. *Source: Authors' Computation (2017) using EViews 9*

The coefficient of determination revealed that about 99.9% changes in education sectoral output is due to changes in recurrent and capital educational expenditures. The D-W statistics (2.529832) revealed no autocorrelation while the F-statistics (15892.93) showed that in the long run, variation in the dependent variable is due to the joint effect of the explanatory variables. However recurrent educational expenditure did not conform to a priori expectation. The negative sign (-0.165082) showed that the effect of recurrent expenditure on education over the years has somewhat retarded growth of educational sector. However, the coefficient was not significant (0.6385), indicating that the negative relationship in the period under review could not have been so severe. Though the coefficient of capital educational expenditure (p value of 0.9972) was insignificant but rightly signed (coefficient of 0.001219), indicating a non-significant but positive relationship between educational expenditure and education sectoral output. These results were attributed to policy mismatch and leakages among others. Also, this rests on the premise that only key extraneous factors as stated above could retard growth and create such inconsistent results.

Table 6 below reveals the results for the bound test. The null hypothesis of the model is that there is no long run relationship between education sectoral output and the included regressors (REDX and CEDX). The F-statistics value of 129.8432 shows a long-run relationship between education sectoral output and the included regressors in the estimated ARDL model. Thus, the independent variables exert long-run impact on education sectoral output in Nigeria. Hence, the null that there is no significant relationship between recurrent educational expenditure and education sectoral

growth is rejected. Also, from the results on Tables 5 and 6, the null that there is no significant relationship between capital expenditure on education and education sectoral output/growth is rejected.

Table 6: Bound Test for Educational Expenditure and Education Sectoral Output

Variables Examine	Lags	F-Stat.	10% Critical bound		5% Critical bound		2.5% Critical bound		1% Critical bound	
			Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound
REDX CEDX EGDP	2	129.8432	3.17	4.14	3.79	4.85	4.41	5.52	5.15	6.36

Notes: The lag structure was selected based on the Schwartz criterion. The bounds critical values are obtained from the unrestricted intercept and no trend for one regressor (Pesaran et al., 2001).

Akaike Information Criterion (AIC) was used to select automatic lag length of 2 for the dynamic regressors of the model. *Source; Author's computation (2017) using Eviews 9*

5 CONCLUSIONS AND RECOMMENDATIONS

This study empirically investigated the nexus between educational expenditure and economic growth in Nigeria using the Autoregressive Distributed Lag (ARDL) and bound test approach developed by Pesaran and Shin, 2001. The ARDL result revealed some degree of inconsistencies as regards the impact of recurrent and capital expenditures on sectoral output. However, the bound test showed that both recurrent and capital expenditures on education had long-run significant relationships with education sectoral growth. On the other hand, while recurrent educational expenditure was found to be statistically significant with respect to real GDP (economic growth), capital educational expenditure exhibited insignificant impact on economic growth in both short and long run. The study concluded that the impact of educational expenditure on real GDP is a function of the level of investment in expenditure types in Nigeria. This is attributed to the fact that only recurrent educational expenditure had both positive and significant long-run impact on economic growth within the period of study. This reflected the fact that educational expenditure under the period of study has been distorted by extraneous factors like policy mismatch, inadequate funding as well as fund misappropriation.

The study recommended that; in line with international standards, the Nigerian educational system requires an institutional transformation in terms of policy formulation, implementation and monitoring. There is also the need for sincere commitment through proper funding in adherence with UNESCO minimum benchmark of 26% education share of total budgetary allocation. Extraneous factors like corruption and embezzlement need to be checked to avoid undue leakages in the educational sector. Also, the need to prioritize capital investment in education especially in technical and vocational education becomes imperative. Lastly, sincere commitment by stakeholders in the education industry (government and its agencies, students, educational investors among others) towards their obligations could go a long way in correcting the anomaly that has over time distorted the relationship between educational expenditure and economic growth in Nigeria.

This study was not extended to educational expenditure across educational levels. We hope that further research in this endeavor should embrace this - as it would be highly rewarding.

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