Education and Economic Growth: Empirical Evidence from Nigeria

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Experts opined that education affects the society both at the micro and macro levels. However, the place of education has not been given its right place in Nigeria as reflected in the nation's budgetary allocations. Hence, this study examined the impact of different levels of education on different components of growth in Nigeria. Data were sourced from the CBN *Statistical Bulletin* (see http://www.cbn.gov.ng/documents/statbulletin.asp), the Nigerian Bureau of Statistics (see http://www.nigerianstat.gov.ng) and The World Bank (see http://www.worldbank.org) from 1970–2015. The Fully Modified OLS estimator was used and the results revealed that different levels of education impact at varying magnitude on each of the components of growth positively in Nigeria but the magnitude of the impact is much higher from completion rate. By implication completion rate explains growth at a higher magnitude than enrolment rates in Nigeria, therefore government should endeavour to provide modalities to curtail school dropout rate in the schooling system as a measure to boost completion rates that will facilitate growth.

Key Words: education, non-oil growth, oil growth, fully modified OLS
JEL Classification: I2, J24, O4
https://doi.org/10.26493/1854-6935.16.59-77

Introduction

Policy makers and development planners have recognized the pivotal place of education as a means of increasing output as it has the capacity to improve health, productivity and provides an escape route from poverty. Hence, considering the place of education in nation building, countries

TABLE 1 Human Development Index and Years of Schooling

Countries	HDI	Expected Years of Schooling	Mean Years of Schooling
Nigeria	0.527	10.0	6.0
Ghana	0.579	11.5	6.9
South Africa	0.666	13.0	10.3
Kenya	0.555	11.1	6.3

NOTES Based on data from UNDP (see http://hdr.undp.org/en/content/human-development-index-hdi).

of the world have been investing on this all-important sector, as the development of any nation may be traceable to its level of stock of human capital, which normally entails education and health (Umo 2007; Dauda, 2010; Kakar, Khiljiand, and Khan 2011). While these two factors are key to national development, several studies have found that the former impacts positively on the latter (see Gyimah-Brempong 2011). The nexus between education and growth have continued to attract the attention of economists and policy makers as an engine for increased economic growth. Experts argued that education impacts the society at both the micro and macro levels (Barro and Lee 2010; Bashir, Herath, and Gebremedhin 2012; Barro 2013) but the quest of most developing countries to maximally utilize education to break out of the vicious circle of poverty and increase output has been a challenge (Barro 1997; Anyanwu et al. 1997).

Additionally, investment in education secures return in the form of skilled work force that could be geared to the needs of development, both for accelerating economic development and for improving the quality of the society (Yogish 2006). For instance, countries that are closer to the technological frontier, high brow education include research and innovation provides the path for technological advancement that increases labour productivity and economic growth whereas; low brow education sufficient for imitation of technology aggrandizes productivity and making them far from the frontier (Aghion et al. 2006). In Nigeria however, investment in the recurrent and capital expenditure on education has been low, unstable and inadequate considering the ever increasing demand for formal education, thereby rendering the available learning infrastructures to be short in supply.

Nigeria with all her oil wealth is ironically classified as a low-income country, a mono-product dependent economy with a rapidly growing

population but has a low adult literacy rate among other features. For instance, the Human Development Index (HDI) for Nigeria in 2015 stood at 0.527 compared to South Africa, Ghana and Kenya with HDI of 0.666, 0.579 and 0.555 respectively (see table 1). Similarly, the adult literacy rate in Nigeria was 29, 39.9 and 39.2 in 2006, 2008 and 2009 respectively and varies even with countries along the same regional bench such as that of Ghana which was 35.8, 34.2 and 33.4 while Benin stood at 60.3, 59.3 for 2006 and 2008 though reduced to 30 in 2009 (see http://hdr.undp.org/en/content/human-development-index-hdi). The abundance of well-educated people goes along with high level of labour productivity and that a larger number of more skilled workers have greater ability to absorb advanced technology from developed countries (Barro and Lee 2010).

The nexus between education and growth have continued to attract the attention of economists and policy makers. Experts opined that education impacts the society both at the micro and macro levels. However, the place of education has not be given its right place in the case of Nigeria as reflected in the nation's budgetary allocations and the ugly characteristics rocking the sector. The country is also characterized by dualism in every form such as oil and non- sector and this dualism also reflect in the contributions to growth and education impacts on these components differently.

Several studies (Babatunde and Adefabi 2005; Dauda 2010; Adesoye 2010; Nurdeen and Usman 2010; Loto 2011; Odior 2012; Adewara and Oloni 2012; Odeleye 2012) have delved into the likely effects of education on economic growth in Nigeria with many focusing on capturing education from expenditure perspective with specific emphases on primary school enrolment rate as proxy for human capital in their growth model. Surprisingly, the available expenditure data does not capture consolidated education expenditure in Nigeria, as the country is a three-tier system of government. Whereas school enrolments and education expenditures are good measures for assessing education, but not sufficient, as they are flow of resources devoted to the education capital formation, enrolment rate should be a better measure especially in the Nigeria case and this present study intends to bridge this gap.

Also, Gyimah-Brempong (2011) found that different levels of education impacts growth differently and studies in this area need to disaggregate education into the different level else the result will be misleading and bias. To the best of our knowledge, there is little or no study in Nigeria

that examined educational impact on growth by capturing the different levels of education in one study and this present study also intends to bridge this gap.

Another propelling factor for this study is borne out of the desire to investigate the contributions of education to the development of both the Oil and Non-Oil sectors in Nigeria. Since Nigeria is a mono-product based economy, education has the capacity to improve other sectors of her economy and adapt new technologies to promote long run economic growth. The study is at variance with previous studies as it focuses on the impact of different levels of education or schooling on different components of growth in Nigeria as well. The study is structured into five sections. Section two presents the empirical literature, while section three discusses the methodology used, section four delves into the discussions of the empirical results and lastly section five concludes the paper.

Empirical Review

The empirical literature on the effects of education on economic growth has been an issue of intellectual discourse for ages with several and sometimes conflicting views. Economists believe that investment on education or human capital increases output and labour productivity. The arguments stem from the position that a positive causal relationship exist between the proportion of government income spent on education and long run growth while some others hold the view that increasing the education spending does not necessarily translate to economic growth.

Meanwhile, there have been robust literatures on the effects of education on growth but from analytical perspective the issue of concern has been what is the best instrument for measuring education (Dowrick 2002; Barro and Lee 2010; Barro 2013). A closer look at the literature classified these measurements into flow variables (flow of resources devoted to education capital formation) and stock variables (stock of education human capital), however, available evidence favoured the stock variables more but it all depends on data availability. From the literature, there are several ways to measure education. While some studies measure it as the enrolment rate (Easterly and Rebelo 1993; Barro 1997; Dowrick 2002; Hanushek and Woessmann 2007), others measure it as education expenditure/GDP ratio (Musila and Belassi 2004; Pradhan 2009; Chadra 2010; Nurudeen and Usman 2010; Loto 2011; Odior 2011; Adewara and Oloni 2012). Some other studies measured it as completion/attainment rate as well as years of schooling (Barro and Sala-I-Martin 2004; Barro and Lee

2010; Gyimah-Brempong 2011; Barro 2001; 2013). However, enrolment rate and education expenditure are classified as flow variables that is they show the flow of resources to human capital formation while years of schooling or school attainment are stock variables that is, they measure the stock of educational human capital (Gyimah-Brempong 2011; Barro 2013). Most endogenous growth empirics used enrolment rate as a measure of human capital (Barro 1997; 2001; Dowrick 2002; Diop, Dufrenot, and Sanon 2010). Of all these measures of education, school attainment or years of schooling is most preferred as espoused in the literature as it is a measure of stock of human capital but this is often faced with measurement problems and data availability constraints (Easterly and Rebelo 1993; Barro 2013).

For the specific case of Nigeria, almost all the studies used education expenditure as measure of education (Nurudeen and Usman 2010; Loto 2011; Odior 2011; Adewara and Oloni 2012) though few of them included primary school enrolment rate to capture human capital in their growth model. But, the available expenditure data captures only the federal government expenditure on education and not the consolidated education expenditure as Nigeria operates a three tier government (local, state and federal) where all the tiers have their spending commitment to education and as well the private sector involvement. Besides, Diop, Dufrenot, and Sanon (2010) showed that public expenditures in most ECOWAS countries would reach the growth objectives if public office holders are made to be more accountable to the public, which has the ability to reducing bribe-seeking and rent-seeking behaviours in public investment. This study further reiterated that most of the ECOWAS countries are faced with diversion of public funds, embezzlements and poor public service delivery. It is in this regard that this present study intends to use different levels of enrolment rates that capture the three tiers of government flow of resources to the different levels of education or schooling better than the available federal government expenditure as used by previous studies. The study also used the only available stock variable (secondary school completion) data to capture education and examines its impact on the different aspect of growth.

Babatunde and Adefabi (2005), Dauda (2010), Adesoye (2010), Nurdeen and Usman (2010), Loto (2011), Odior (2011), Adewara and Oloni (2012), and Odeleye (2012) have delved into the likely effects of education on economic growth in Nigeria but the results are mixed. This is due to the methodology used and the variable for capturing education. For

instance, Babatunde and Adefabi (2005) examined the long run relationship between education and economic growth in Nigeria using evidence from the Johansen's co-integration approach for the period 1970–2003. The authors examined specifically two channels through which human capital can affect long run economic growth in Nigeria. The first channel is when human capital is a direct input in the production function while the second channel is when the human capital can affect the technology parameter. The authors observed that though it may be difficult to separate the two channels from each other, the result revealed that a well-developed labour force possessed a positive and significant impact on economic growth through factor accumulation and on the evolution of total productivity. Thus, a good performance of an economy in terms of per-capita growth may therefore be attributed to a well-developed human capital base.

Odior (2011) examined the impact of government increase in spending on education on economic growth in Nigeria using the Computable General Equilibrium (CGE) model calibrated with a 2004 Social Accounting Matrix (SAM) data of the Nigerian economy. The study revealed among other things that reallocating resources to education sector is significant in explaining economic growth in Nigeria. Based on the finding of the study, the author concluded that education should be highly prioritized among other public expenditures, as it is capable of leading to long run substantial growth of the economy. Unarguably, moving resources from unproductive ventures to education (as is the case sometimes, due to rent seeking, misallocation of fund, diversion of public fund) will enhance quality of education; reduce poverty levels since investment in education is one of the pro-growth policies for promoting economic growth.

Odeleye (2012) examined education and economic growth in Nigeria using primary and secondary data for the period 1985–2007 and adopted the OLS technique. Findings from the study revealed that only recurrent expenditure had significant effects on economic growth, and that the academic qualification of teachers had significant impact on students' academic performance. The result of this study is not very different from several other studies on the impact of public expenditure on education except that it tends to deviate a little by revealing the pivot place of recurrent expenditure on learning outcomes as well as growth.

Adesoye (2010) examined the link between government spending and economic growth in Nigeria for the period 1977–2006 using the time series data to analyse the RAM model comprised of three variants con-

structed for the study. These include: regressing Real GDP on Private investment, Human capital investment, government investment and Consumption spending at absolute levels; regressing it as a share of Real output and regressing the growth rate Real output to the explanatory variables as a share of GDP in order to capture the precise link between public investment spending and economic growth in Nigeria based on different levels. The results revealed private and public investments had insignificant effects on economic growth during the period under review. The study's main policy recommendation was that government spending should be channelled especially to education and infrastructural facilities in order to influence economic growth significantly and positively in Nigeria. Results from this study is not far from the submission of Nurudeen and Usman (2010) who found a negative effect of government expenditure on education on growth in Nigeria and recommended increase in both the recurrent and capital expenditures on education.

Loto (2011) investigated the growth effects of government expenditure in Nigeria over the period of 1980–2008 with particular focus on sectoral expenditures. In the study, five key sectors were chosen (Security, Health, Education, Transportation and Communication and Agriculture). Results from the study revealed that in the short-run, expenditure on agriculture was found to be negatively related to economic growth. The impact of education, though also negative was not significant. The impact of expenditure on health was found to be positively related to economic growth. Though expenditures on national security, transportation and communication were positively related to economic growth, the impacts were not statistically significant. The author added that it is possible that education expenditure could be positive in the end if brain drain is checked.

Adewara and Oloni (2012) in a study of the composition of public expenditure and economic growth in Nigeria for the period 1960–2008 observed that expenditure on education failed to enhance economic growth. This, the authors argued may not be unconnected to the high rate of rent seeking coupled with the growing rate of unemployment.

Gyimah-Brempong (2011) examined the effects of education on several development outcomes in African countries for the period covering 1960–2010 using different sets of estimation techniques. The study among other things revealed that educational attainment had significant impact on all development outcomes ceteris paribus, and that different levels of education affect development outcomes differently.

Theoretical Framework and Model Specification

THEORETICAL FRAMEWORK

This study follows a framework espoused from Barro and Lee (2010) which assumes a Cobb-Douglas Production function. This framework follows the endogenous growth theory path. Assume a Cobb-Douglas function as:

$$Y = AK^{\alpha}H^{1-\alpha}, \tag{1}$$

where, Y is output, K is stock of physical capital, H is human capital stock, and A is total factor productivity.

Assuming $H = hL$, where h represents the amount of human capital per worker and L the number of workers, the production function can be rewritten as:

$$Y = AK^{\alpha}(Hl)^{1-\alpha}, \tag{2}$$

Expressing the variables in per worker term and then taking log, we have:

$$\log\left(\frac{Y}{L}\right) = \ln A + \log\left(\frac{K}{L}\right) + (1-\alpha)\log\left(\frac{H}{L}\right)$$

or

$$\log y = \ln A + \alpha \log k + (1-\alpha)\log h, \tag{3}$$

where, y is output per worker and k is capital stock per worker, Barro and Lee (2010) assumed human capital per worker to be directly proportional to education (schooling), we have:

$$h = e^{\phi(s)}. \tag{4}$$

In the above equation, $\phi(s)$ denotes the efficiency of a unit of labour, with s years of education. If we assume further that $\phi(s)$ is linear thus:

$$h = e^{\theta s}. \tag{5}$$

Substituting equation (5) into equation (3):

$$\log y = \log A + \alpha \log k + (1-\alpha)\theta s. \tag{6}$$

To measure the relationship between output and human capital, Barro and Lee (2010) estimated thus:

$$\log Y_t = \beta_0 + \beta_1 \log K_t + \beta_2(s_t) + \varepsilon_t. \tag{7}$$

MODEL SPECIFICATION

Based on the above framework and following Hanushek and Woessmann (2009) and Barro (2013) that extended the above to account for different

levels of education (primary, secondary and tertiary), the study specifies an empirical model on the relationship between education and economic growth thus:

$$\log Y_t = \psi_o + \psi_1 pryernl_t + \psi_2 secenrl_t \psi_3 terenrl_t + X\beta + \mu_{1t}, \quad (8)$$

$$\log Y_t = \alpha_o + \alpha_2 seccomp_t X\beta + \mu_{2t}, \quad (9)$$

where Y is used to capture either oil growth, non-oil growth or overall economic growth depending on the model, *pryenrl*, *secenrl*, and *terenrl* are primary school enrolment rate, secondary school enrolment rate and tertiary school enrolment rate respectively, *seccomp* represents secondary school completion, X is a vector of other explanatory variables included in each of the models (the included variables are defined below), and ε is a stochastic error term. Equation (8) is to examine the effect of education on growth through flow of resources devoted to human capital formation channel while equation (9) examines education effect on growth through stock of education capital channel.

Data Source and Method of Analysis

To empirically analyse the long-run relationships and short run dynamics interactions between education capture by school enrolment and completion rates and growth as espoused from the theoretical framework from equation (1) to (6). Several estimators are proposed in the presence of cointegration. These include The Error Correction approach (OLS), Fully Modified OLS (FMOLS), and the Dynamic OLS (DOLS). The study adopted the Fully Modified OLS approach. This estimator corrects the standard OLS for serial correlation and endogeneity of regressors that are normally present in a long-run relationship (Pedroni 1996; 1997). It also allows consistent and efficient estimation of cointegrating vectors. The FMOLS is an alternative cointegration approach that also bypass the problem faced by econometricians in the usual having to start with over parameterized model and trying to arrive at the parsimonious model (Pedroni 1996). Present below is the Fully Modified OLS equation.

$$y_t = \alpha + \beta x_t + \mu_t, \quad (10)$$

$$y_t = \alpha + \beta x_t + \sum_{k=-k}^{k} \gamma_t \Delta x_{t-k} + \mu_t, \quad (11)$$

where y is the dependant variable that takes either Non-oil GDP growth, Oil GDP growth and/or per capita RGDP growth, x is a vector of explana-

tory variables depending on the model, k takes the form of a lead (1) or lag (1), and μ is the stochastic error term.

The data cover the period 1970–2015 and were extracted from the CBN *Statistical Bulletin* and the Nigerian Bureau of Statistics. The data used in the estimation are Non-oil GDP growth (captured by log of non-oil GDP per capita (NOGDPPC)), Oil GDP growth (captured by log of Oil GDP per capita (OILGDPPC)), Economic Growth (proxied by log of Real GDP per capita (RGDPPC)), Primary School Enrolment rate (PRYENRL), Secondary School Enrolment rate (SECENRL), Secondary School Completion rate (SECCOMP), tertiary school enrolment rate (TERENRL), other variables included in the models are log of capital formation (KFM) and a time trend (t).

Empirical Analysis

UNIT ROOT TEST

The study began its analysis by conducting stationarity test to establish the unit root status or otherwise of the variables and the appropriateness of the specification of the Fully Modified OLS approach. Thus, both the Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) unit root tests are employed in this study. The results are reported in table 2.

The result as reported in table 2 shows that all the variables are non-stationary in their levels. The variables became stationary after the first difference. This is supported by both the ADF and PP unit root test results. This is an indication of I(1) variables. Hence, testing for the long run relationship of the variables became necessary.

COINTEGRATION TEST

One of the main steps in using any of the cointegration approaches is to establish long-run relationship among the variables. Therefore, the study adopted the Engle-Granger residual based cointegration test as presented in table 3.

It is evident from table 3 that the residuals from the long run models all passed the unit root test, as they were all significant at 1% level that establishes the existence of cointegration in all the models alluding to the fact that there exists a long run relationship in all the models.

Empirical Result

Based on the establishment of long run relationship among the variables, we proceed to estimate empirical models using Fully Modified OLS

TABLE 2 Unit Root Test Result

Variables	Augmented Dickey Fuller				Phillips-Perron				RMK
	Without trend		With trend		Without trend		With trend		
	Level	1st diff.	Level	1st diff	Level	1st diff	Level	1st diff.	
Log(non-oil GDP per capita)	3.44	−4.34*	0.92	−5.31*	3.57	−4.34*	0.87	−5.31*	I(1)
Tertiary enrolment rate	−0.82	−4.11*	−1.96	−4.12*	−0.45	−6.75*	−2.13	−6.77*	I(1)
Secondary enrolment rate	−0.42	−2.65	−2.03	−3.76*	−0.42	−4.39*	−2.52	−3.78*	I(1)
Primary enrolment rate	−2.46	−3.78*	−2.18	−3.58*	−2.30	−3.58*	−1.78	−3.75*	I(1)
Secondary completion rate	−1.29	−4.30*	−1.69	−4.29*	−1.26	−6.16*	−1.79	−6.12*	I(1)
Log(oil GDP per capita)	−1.33	−5.26*	−2.15	−5.34*	−1.24	−7.22*	−2.47	−7.28*	I(1)
Log(real GDP per capita)	−0.66	−4.89*	−2.32	−4.83*	4.46	−6.43*	−2.36	−6.34*	I(1)
Log(capita formation)	−0.36	−5.04*	−0.89	−5.11*	−0.76	−6.32*	−0.27	−4.98*	I(1)

NOTES * indicates 1% level of significance.

TABLE 3 Engle-Granger Residual Based Single Equation Cointegration Test Result

Residuals	ADF stat.	Critical values			Residuals	ADF stat.	Critical Values		
		1%	5%	10%			1%	5%	10%
Residual 1	−5.36	−3.54	−2.86	−2.52	Residual 4	−5.68	−3.54	−2.86	−2.52
Residual 2	−5.46				Residual 5	−6.47			
Residual 3	−5.61				Residual 6	−5.38			

TABLE 4 Schooling and Economic Growth in Nigeria

	School Enrolment and Growth Equation		School Completion Rate and Growth Equation	
Regressors	Coefficients	*T*-ratio	Coefficients	*T*-ratio
c	0.170**	2.214	0.050*	1.721
Primary enrolment rate	0.018*	1.677	–	–
Secondary enrolment rate	0.064***	6.048	–	–
Secondary completion rate	–	–	1.120***	3.664
Tertiary enrolment rate	0.031**	2.478	–	–
Log(capital formation)	0.430**	2.443	0.570***	2.962
t	0.024***	2.986	0.025*	1.790
R^2	0.782		0.792	–
Durbin-Watson	1.820		2.040	–

NOTES ***, **, and * indicates 1%, 5%, and 10% level of significance, respectively.

(FMOLS) cointegration approach. Table 4 shows that about 78% of the total variation in economic growth is explained by the included variables in the result. The Durbin Watson statistics values of 1.82 and 2.04 also indicates that the result is devoid of serious econometrics problem as the value implies that there is no serial correlation associated with this result.

A cursory look at the result indicates that schooling has positive and significant effect on economic growth in Nigeria. It was revealed that all levels of schooling impacted overall real GDP per capita positively though the magnitude of the effect differs across levels of schooling. For instance, the coefficient of schooling at the primary school level proxied by primary school enrolment rate was found to be 0.018 and it is significant at 10% which invariably indicates that changes in primary school enrolment facilitates per capita GDP for about 0.018. However, the coefficient of schooling at the secondary level captured by secondary enrolment rate was found to be 0.06 and it is significant at 1% level, which implies that changes in secondary enrolment rate triggered overall GDP per capita for about 0.064. The coefficient of schooling at the tertiary level was found to be 0.03 and it is significant at 5%, the magnitude of the effect is less than that of secondary level schooling in Nigeria. This is not surprising as percentage of the Nigerian population with secondary level schooling are more than that of tertiary and besides the facts that they are involved in more productive activities than those with tertiary level schooling that are faced with alarming rate of unemployment that ren-

TABLE 5 Schooling and Non-Oil GDP Growth in Nigeria

	School Enrolment and Growth Equation		School Completion Rate and Growth Equation	
Regressors	Coefficients	*T*-ratio	Coefficients	*T*-ratio
c	0.260**	2.330	0.320*	1.680
Primary enrolment rate	0.134*	1.712	–	–
Secondary enrolment rate	0.101***	3.710	–	–
Secondary completion rate	–	–	1.217***	2.920
Tertiary enrolment rate	0.027**	2.210	–	–
Log(capital formation)	0.110	1.090	0.070*	1.780
T	0.030**	2.540	0.090*	1.820
R^2	0.891	–	0.684	–
Durbin Watson	1.810	–	1.890	–

NOTES ***, **, and * indicates 1%, 5%, and 10% level of significance, respectively.

ders them incapacitated from being involved in productive activities. On the other hands, secondary level schooling captured by secondary completion rate was found to have a greater magnitude of positive and significant effect on overall growth in Nigeria than as captured by enrolment rate. The coefficient was found to be 1.12 and it is significant at 1%.

By implication, it is an indication that not all who enrolled completed and the effect of schooling from the perspective of completion rate is much higher. The findings here are consistent with the studies of Barro (2013), Gyimah-Brempong (2011), Benhabib and Spiegel (1994), Barro and Sala-i-Martin (1997), and Sala-i-Martin (1997) that found schooling to be positively correlated with the per capita real GDP. All other variables included in the model were found to have the expected signs and were significant. For the other variables to have the expected signs, it is an indication that schooling in the output per capita models is not just one of the control variables but a key and relevant variable in output equation in Nigeria. One main implication that can be drawn from this result is that disaggregating schooling or education into different levels is key in explaining the effect of education on growth.

One main area in which this present study is at variance with the previous studies especially in Nigeria is that it examined the effect of schooling or education on sectoral output and for this reason, the study separated growth into non-oil and oil growth and examine how different levels of schooling impact on them.

Table 5 shows the value of R^2, which is 0.89, that about 89% of the variation in non-oil GDP growth is explained. The Durbin-Watson values of 1.81 and 1.89 indicate that there is no autocorrelation associated with this result, which is an indication of the fact that the result is devoid of econometrics problem.

A closer look at the result in table 5 shows that schooling impacts non-oil GDP per capita positively and this is significant. However, lower levels of schooling were found to have a greater magnitude of effect on non-oil GDP growth in Nigeria. For example, the coefficients of primary, secondary and tertiary enrolment rates are 0.134, 0.101 and 0.027 respectively and they were all significant but the magnitude of the effect is much higher at the primary school level, this is not surprising because agriculture still dominates the employment statistics of the Nigerian populace and the agricultural sector is dominated by people of lower educational cadre basically the primary and the secondary levels. Completion rate, which is the alternative measure of schooling/education in this study, was found to impact non-oil GDP per capita positively and this is significant. The coefficient in magnitude is higher than that of schooling captured by enrolment rates.

The implication is that school completion has much impact than school enrolment. This invariably implies that enrolment is an indicator of flow of resources to education, which would not guarantee that those enrolled would complete their education and thereby contribute to growth. This means that, human capital as a driver of growth is better captured by completion rate indicative of stock of human of human capital.

Table 6 shows the impact of schooling on per capita oil-GDP in Nigeria. It is evident from the table that about 79% of the total variation in oil GDP per capita is explained as shown by the R^2 value of 0.792 and the Durbin-Watson statistics values of 1.97 and 2.03 are indications that there is no serial correlation in this regression result.

It can be deduced from the result that schooling at different levels had positive and significant effect on oil GDP per capita in Nigeria except for the coefficient of primary level of schooling that is found to be insignificant though positive in its impact on oil GDP per capita. It is also very clear from the table that the magnitude of the effect is much higher in higher level of schooling than lower levels. For instance, the coefficients of schooling are found to be 0.036, 0.07 and 0.16 respectively for primary, secondary and tertiary levels of schooling respectively.

TABLE 6 Schooling and Oil GDP Growth in Nigeria

	School Enrolment and Growth Equation		School Completion Rate and Growth Equation	
Regressors	Coefficients	*T*-ratio	Coefficients	*T*-ratio
c	0.430**	2.640	0.190**	2.520
Primary enrolment rate	0.036	0.774	–	–
Secondary enrolment rate	0.070***	5.740	–	–
Secondary completion rate	–	–	1.281***	2.830
Tertiary enrolment rate	0.160**	2.300	–	–
Log(capital formation)	0.060	1.220	0.120*	1.730
T	0.046***	3.320	0.092**	1.980
R^2	0.731	–	0.792	
Durbin Watson	1.970	–	2.030	

NOTES ***, **, and * indicates 1%, 5%, and 10% level of significance, respectively.

This implies that the oil sector is involving with regards to technical know-how and a higher level of schooling or education demanded for proper contributions on the sector on the part of the citizenry. Completion rate was also found to impact oil-GDP growth positively and significantly too and the magnitude of the effect as in the case of the previous result is much higher than that of enrolment rates.

Conclusion

This study examined the impact of education on economic growth in Nigeria and specific consideration was made on the different components of growth such as non-oil growth, oil growth and overall economic growth captured by non-oil GDP per capita, oil-GDP per capita and real GDP per capita respectively in Nigeria. The place of non-oil sector in facilitating growth and development cannot be over-emphasized as the sector determines largely the needed diversification of the economy and salvaging the Nigerian economy from an oil dependent one. However, the oil sector has not triggered the expected growth and development in the country despite the huge revenue from the resource. Experts argue that one of the main problems facing such resource dependent economies is management of the resource wealth. Education on the other hand serves as engine of growth and development and therefore, investment in education is a tool for developing inexhaustible resources (human capital), hence this study is not only timely but also inevitable. The study captured

education or schooling from two channels vis-à-vis; enrolment rate and as well completion rate. The study finds all levels of schooling to be fundamental in affecting overall growth positively and that schooling in a growth model is not serving as a control variable but a relevant one in explaining the behaviour of growth in Nigeria. The study revealed the effect of primary, secondary and tertiary enrolment rates on overall growth to be 0.018, 0.064 and 0.031 respectively and that of completion rate to be 1.12.

By implication, secondary schooling impacts overall growth much more than others and the magnitude of the effect is higher when education or schooling is captured by completion rate. This can be explained that school completion is more relevant to overall growth than enrolments. This is the case for all the other estimated models that is, the non-GDP and oil GDP growth models as completion rate impacts on them on a higher magnitude. Productivity as captured by a time trend in all the models was found to facilitate overall growth as well as non-oil and oil growth in Nigeria. One significant finding of this study is that lower levels of schooling impacts non-oil GDP growth much more than oil GDP growth while higher level of schooling impacts oil GDP growth on a higher magnitude than non-oil GDP growth. Consequently, since completion rate explains growth at a higher magnitude than enrolment rates in Nigeria, government should therefore endeavour to provide modalities to curtail school dropout rates in the schooling system. It is therefore recommended that the present universal basic education policy be given top priority with proper monitoring, supervision and financial supports as the policy has the capacity to curtail school drop outs and ensure that all have access to basic education at no or low cost as this will facilitate higher completion rate in Nigeria which is crucial for growth.

Acknowledgments

We wish to express our deep appreciation to African Economic Research Consortium (AERC) for the financial support to carry out this research. We are also grateful to the resource persons and members of AERC's thematic group B for various comments and suggestions that helped the evolution of this study from its inception to completion. We are indebted to the anonymous referees who reviewed the paper and provided comments and suggestions that helped in shaping and improving the overall quality of the paper. The findings made and opinions expressed in this paper are exclusively those of the authors. The authors are also solely responsible for content and any errors.

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