

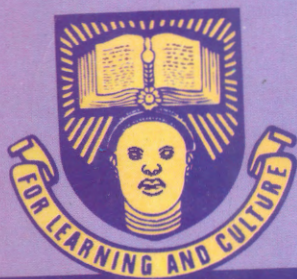
# IFE JOURNAL OF THEORY AND RESEARCH IN EDUCATION

ISSN: 0794-6754

# IJOTRE

JOURNAL OF THE  
INSTITUTE OF EDUCATION

**OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE.**



**BI-ANNUAL**  
Vol. 17, Nos. 1 & 2, 2016



# **IFE JOURNAL OF THEORY AND RESEARCH IN EDUCATION**

ISSN: 0794-6754



**Journal of the Institute of Education  
Obafemi Awolowo University,  
Ile – Ife.**

**Bi – Annual  
Vol. 17, Nos. 1 & 2, 2016.**

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## Investment in Education and Inclusive Growth: Any Relationship for Nigeria?

**Adediran, Oluwasogo S.**

Corresponding Author: Department of Economics and Development Studies,  
College of Development Studies, Covenant University, Ota, Ogun.

E-mail: [oluwasogo.adediran@covenantuniversity.edu.ng](mailto:oluwasogo.adediran@covenantuniversity.edu.ng)

08067427261

**Amoda, Bisola M.**

Business Education Department  
Tai Solarin University of Education,  
Ijagun, Ijebu – Ode, Ogun State.

[amodabisola@gmail.com](mailto:amodabisola@gmail.com)

08055418653

**Adebayo, Adekunle A.**

Department of Economics  
Michael Otedola College of Primary Education,  
Naforija, Epe, Lagos State.  
[mayanalytics@gmail.com](mailto:mayanalytics@gmail.com)

### Abstract

*Until recently, the last decade has witnessed massive economic growth in Nigeria, but the literature has proved that the growth has not been inclusive in nature. This is because, in spite of the level of growth recorded overtime, the poverty rate is still very high. This study investigates the relationship between human capital (education) and inclusive growth in Nigeria between the sample period of 1981 to 2013. The Johansen co-integration method and Error Correction Mechanism (ECM) were adopted. The result reveals that human capital has a positive and significant long run relationship with inclusive growth in Nigeria. While, it showed a negative and significant relationship for public capital expenditure on education and a negative, it was not having significant relationship with public recurrent expenditure and education. The study however suggest that, for the Nigerian economy to maximise the benefits from human capital and public expenditure on education, the government must initiate policies that will drive not only quantity and quality education, but that is all inclusive, so as to create more employment opportunities. An increase in employment will therefore increase income and standard of living, which will in turn reduce poverty and inequality.*

**Keywords: Education; Inclusive Growth; Economic Growth; Poverty and Inequality.**

### Introduction

The research on the role of human capital in economic growth cannot be overemphasized in the study of the economies of the developed and developing countries. Following Becker (1962) and Schultz (1961), human capital can be defined as the set of knowledge, skills, competencies, and

abilities embodied in individuals and acquired, for example, through education, training, medical care, and migration. Therefore, education is considered as one of the most significant human capital investments that a nation can embark upon. It plays an important role in the process of economic growth and various amount of researches have been undertaken to access the link between education and growth (Lawal and Iyiola, 2011; Ndiyo, 2007, Benos and Zotou, 2014). Looking at this nexus from the theoretical point of view, economic models have emphasized the role of education in determining returns on education that ultimately foster economic growth (Lucas 1988; Rebelo 1991 and Romer, 1994).

All these models have explained the important distinction between neo-classical and endogenous growth theories regarding the linkage between human capital and economic growth. The former argue that a one-off permanent increase in the stock of human capital results in a one-off increase in the economy's growth rate until the economy reaches the new higher steady-state. Moreover, there are two strands of new growth theories, which focus on the impact of (a) human capital accumulation and (b) human capital stock respectively. A one-off rise in human capital causes a one-off output increase in human capital accumulation and a permanent increase in growing human capital stock. Consequently, the social benefits of education are much greater in the latter case (Sianesi and VanReenen, 2003).

Theoretical contributions also emphasized different mechanisms through which education affects economic growth. First, education increases the human capital of the labor force, which increases labor productivity and transitional growth toward a higher equilibrium output level. Second, in endogenous growth theories, education increases the innovative capacity of the economy, knowledge of new technologies, products and processes, and thus promotes growth (Hanushek and Woessmann, 2008). From the empirical point of view, studies have shown that education and the policies that facilitate the process of innovation and knowledge creation have profound effects on the long-run economic growth and development patterns of an economy (Barro, 1991; Rebelo, 1991 and Barro and Sala-i-Martin, 1998). Hence, the benefits of information and knowledge diffusion in facilitating economic transactions, productive arrangements, social interactions and political participation are also widely acknowledged (Sen, 1999 and Masino and Nino-Zarazua, 2016).

Meanwhile, the last decade has witnessed massive economic growth in Nigeria, but the literature (see Sodipe and Ogunrinola, 2011; Oseni and Oseni, 2015 and Ayinde and Yinusa, 2016) has proved that the growth has not been inclusive in nature. This is because, in spite of the level of growth recorded overtime, the poverty rate is still very high. While, economic growth is a perfect way to lift people out of poverty into gainful employment and higher incomes that would increase personal spending on education and health (Bhagwati (2011)). With the economy of Nigeria been one of the fastest growing economies in the world, in terms of nominal Gross Domestic Product (GDP) and the largest economy in Africa with an average annual growth rate of 6.2 percent and nominal GDP of \$568 billion (World Development Indicator, 2015). Nigeria accounts for around 55 percent of the West African GDP, 35 percent of Sub-Saharan Africa's GDP and one-fifth of the African population. With these facts, it is evident that the economy is buoyant, prosperous and growing. However, this level of economic prosperity has not shown much visible impact on a large percentage of the participants in the economy. Hence, as the economy is growing, poverty and unemployment are increasing and the inequality gap is widening.

Looking at these issues raised, several of the empirical literature reviewed confirmed that a positive relationship exists between human capital and economic growth, but studies testing the relationship between human capital and inclusive growth is still scanty in Nigeria and this study attempts to fill that gap by introducing new variable to measure inclusive growth. Also, in the empirical literature for Nigeria, many studies only relates human capital to economic growth and neglected the sustainability of growth or how human capital development can solve the growth without development problem of Nigeria. This study attempt to fill that gap.

The rest of the paper is organized as follows. Section 2 gives some stylized facts on the relationship between education expenditure and economic growth. Section 3 presents the proxies employed to measure education and growth and describe the methodology. Section 4 presents the model specification and technique of estimation. Section 5 analyzes the results and main findings. Finally, Section 6 concludes with the policy implications and recommendations.

## 2. Some Stylized Facts

Until 2016, the GDP of Nigeria has been growing at an average of 6.2 percent per annum, but with this growth, most Nigerians are still below poverty line of spending less than \$2 a day. The Gini index that is used to measure inequality has been ranging from 0.4 to 0.47 since 1980. The unemployment rate has equally been higher above 24 percent, according to official figure by the National Bureau of Statistics. Nigeria's poverty rate, inequality rate and unemployment rate are high and correlates with growth rate. The economy is seen as growing outside its people as only the economy is experiencing buoyancy and success, while the people are not so catered for as far as the growth is concerned. The expectation is that as an economy is growing, there should be creation of employment opportunities that will reduce the unemployment rate. An increase in employment will therefore increase income and standard of living, which will in turn reduce poverty and inequality.

In contrast to this, Nigeria is yet to experience such transforming growth as the economy is plagued with increasing unemployment and stagnant low incomes. The presence of stagnant and low income has prevented an increase in expenditure, especially on education. Although, there has been an improvement in the access to education in Nigeria, the quality has continued to decline as a result of poor funding in the recent time (see Ahmed, 2015). For instance in 2010, 2011 and 2012; the allocations were N234.8b representing 6.40 percent, N306.3b (7.69 percent) and N400.15b (10.0 percent) of the total budget respectively. With the following allocations for the subsequent years: 2013-N426.53b (8.70percent), 2014-N493b (10.6percent) and 2015-N392.2b (9.5percent), still far below the expected mark of 26 percent of the total budget recommended by UNESCO.

Inclusive growth entails the participation of the people in the growth of their economy and the ability to enjoy equally the proceeds from this growth. Researchers have done extensive research on this issue as it pertains to inclusive growth. They gave various barriers and constraints to poor people's participation in growth in Nigeria, these include geography; human capital; access to credit; economic insecurity; and health amongst others. Some of the literature argues that facilitating access of the poor to growth is insufficient to obtain inclusive growth; attention must also be paid to the quality of their participation.



### 3. Methodology

The study employed the Lucas endogenous growth model, which is an extension of the neoclassical growth model, but incorporates the positive externalities related to the accumulation of human capital such as knowledge. It also uses a number of techniques of estimation in achieving the objectives of the study. This includes performing a unit root test to test for stationarity, Johansen to test for co-integration and the VECM for short run dynamics. The model and estimation procedures are further explained below. The data employed by this study are annual data (see appendices 1) from 1981-2013 sourced from the World Bank's World Development Indicators (2015) and the Central Bank of Nigeria's Statistical Bulletin (2015).

#### 4.1 Model Specification

A standard production function for primal neoclassical growth model, which applies to the endogenous growth model (Lucas, 1988) is specified as follows:

$$Y = f(A, K, L) \quad (4.1.1)$$

where; Y: output

A: technological change

K: physical capital input

L: labor capital input.

This model provides the theoretical foundations for this study, as it links human capital to economic activities. Hence;

$$Y_t = A_t K_t^\alpha L_t^\beta, \alpha + \beta > 1 \quad (4.1.2)$$

The coefficients  $\alpha$  and  $\beta$  represents the allocation of human and physical capital factor payment in total production. The model assumes an increasing returns to scale on production, in that  $\alpha + \beta > 1$ .

There are two main assumptions on which the model stands. The first assumption is that there are two sectors in the economy; where one is the education sector that uses existing human capital such as teachers to produce new human capital, while the other is the goods sector that depends on human and physical capital inputs to produce output (Mandlebe, 2014).

The second assumption is that of increasing returns to scale on production, this means that factor payments do not use up all the output, with a fraction of the rent spillover appearing in research and development, and knowledge. The spillover, in turn, affects the quantity of output only through technological change ( $A_t$ ), rather than through capital-using or labor-saving route (Easterly and Levine, 2001). Equation (4.1.2) is of the assumption that the technological progress is neutral to labour and capital, thereby leaving the marginal rate of substitution unchanged at a given capital-labor ratio. This equation indicates that the time path of capital and labour determines the time path of real output. Hence, the growth of output is halfway between that of physical capital and human capital (Mandlebe, 2014). The natural logarithm of all variables was used so as to make the variables more comparable. The variables were also transformed and are expected to grow exponentially. While, the model is specified using the cobb-douglas production function.

Given this theoretical relationship, the model is specified as follows:

$$PCIG_t = f(TEDU_t, PED_t, CEE_t, REE_t, GCF_t) \quad (4.1.3)$$

Where  $PCIG_t$ : Per Capita Income Growth (Proxy for Inclusive Growth Rate)

$TEDU_t$ : Tertiary School Enrolment Rate

$PED_t$ : Public Expenditure on Education

$CEE_t$ : Capital Expenditure on Education

$REE_t$ : Recurrent Expenditure on Education

$GFCF_t$ : Gross Fixed Capital Formation

The functional form of the model is:

$$LPCIG_t = \beta_0 + \beta_1 LTEDU_t + \beta_2 LPED_t + \beta_3 LGFCF_t + \beta_4 LCCE_t + \beta_5 LREE_t + U_t \quad (4.1.4)$$

**Table 4.1a: Variables and Apriori Expectations**

Variables	Definition	Measurement	A Priori Expectations
INGR	Inclusive growth	Composite Inclusive growth index	
TEDU	Tertiary School Enrolment rate	Tertiary School Enrolment rate [gross %]	$\beta_1 > 0$
PED	Public Expenditure on Education	Ratio of public expenditure on education to total government expenditure [%]	$\beta_2 > 0$
GFCF	Gross Fixed Capital Formation	Gross fixed capital formation (annual % growth)	$\beta_3 > 0$
CEE	Public Capital Expenditure on Education	Total Capital Expenditure of Government on Education (in millions naira [N])	$\beta_4 > 0$
REE	Public Recurrent Expenditure on Education	Total Recurrent Expenditure of Government on Education (in billions naira [N])	$\beta_5 > 0$

Source: Author's computation

#### 4.2 Technique of Estimation

The technique of estimation adopted for the study is the co-integration technique alongside Vector Error Correction Model (VECM). Co-integration is used to estimate and test for stationarity in linear or co-integration relationships; it ensures stationarity in the linear combination of variables. A regression analysis based on time series data may be unreliable, as it independently assumes that all values are stationary, which may not always be the case. Hence, the regression of a non-stationary time series data will lead to a spurious regression and misleading results. Thus, the estimation procedure in the study begins with a unit root test to test for stationarity or otherwise in the variables. This is followed by a Co-integration test which measures the long run equilibrium relationship between these variables. Finally, a Vector Error Correction Mechanism was conducted. This is to check for an Error Correction Mechanism between time series variables in the short run. It is also known as the speed of adjustment.

### 4.3 Presentation and Discussion of Results

The Augmented Dickey-Fuller (ADF) test was employed in this study. The rule of thumb is such that; the null hypothesis that the variables are non-stationary will be rejected if the absolute value of the ADF test statistics is greater than the critical value 1 percent, 5 percent and 10 percent and if it is less, the null hypothesis is accepted.

The variables LPCIG, LTEDU, LPED, LCEE, LREE and LGFCF, when integrated of order I(1), the ADF test statistics in absolute value are greater than their critical values at 1 percent and 5 percent respectively. Hence, we say they are stationary at first difference. The hypothesis of co-integration states that only a linear combination of series that are integrated of the same order should be attempted. The unit root at first difference was adopted in this study because all variables are stationary at first difference.

**Table 4.1b: Augmented Dickey-Fuller (ADF) Tests for Unit Roots**

Variable	ADF Test Statistic with Constant and Linear Trend	5% Critical Value	Order of Integration	Remark
LPCIG	-6.796268	-2.960411	I(1)	Stationary
LREE	-5.198528	-2.971853	I(1)	Stationary
LCEE	-8.281376	-2.960411	I(1)	Stationary
LTEDU	-4.544821	-2.960411	I(1)	Stationary
LGFCF	-3.902149	-2.960411	I(1)	Stationary
LPED	-5.130745	-2.971853	I(1)	Stationary

Source: Author's Computation using E-views 7.

The Johansen Co-integration test is used to determine the co-integrating rank and number of common stochastic trends in the system. The test is carried out to specify the nature of the long run relationship between inclusive growth based on a question this study seeks to answer. The result of the co-integration rank test present below reveal that there is three co-integration equations for the Trace statistic at the 5 percent level. The result also revealed that there are one co-integration equations for the Maximum-Eigenvalue statistic at the 5 percent level. This study is employs the use of the Maximum-Eigenvalue statistics in interpretation.

The results from the Johansen co-integration test are displayed below in Table 4.I. The T-statistic is used to show the significance of the independent variable in the long run. If the T-statistic is approximately equal to 2 or greater than 2, the variable is statistically significant but however, if the T-statistic is less than 2, the variable is not statistically significant.

Trace Statistic				
Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.798803	126.4560	107.3466	0.0016
At most 1	0.561461	76.74832	79.34145	0.0772
At most 2	0.528594	51.19485	55.24578	0.1085
At most 3	0.385960	27.88172	35.01090	0.2353
At most 4	0.317316	12.76317	18.39771	0.2561
At most 5	0.029547	0.929758	3.841466	0.3349
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
Max-eigenvalue				
Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.798803	49.70765	43.41977	0.0092
At most 1	0.561461	25.55347	37.16359	0.5490
At most 2	0.528594	23.31312	30.81507	0.3104
At most 3	0.385960	15.11856	24.25202	0.4874
At most 4	0.317316	11.83341	17.14769	0.2510
At most 5	0.029547	0.929758	3.841466	0.3349
Max-eigenvalue				

**Table 4.2: Unrestricted Co-integrating Rank Test**

Source: Author's Computation using E-views 7.

Error Correction:	D(LPCIG)	D(LTED)	D(LREE)	D(LCEE)	D(LPED)	D(LGFCF)
CointEq1	-0.887855	0.012877	0.528297	0.170648	0.379989	-0.161552
	(0.15071)	(0.01919)	(0.46210)	(0.36694)	(0.29997)	(0.17548)
	[-5.89113]	[0.67107]	[1.14325]	[0.46506]	[1.26676]	[-0.92063]
R-squared	0.754933					
Adj. R-squared	0.665818					
F-statistic	8.471424					

**Table 4.3: Co-integration Result.**

The normalised co-integration result is written in its implicit form, hence to make it explicit; it is rewritten by changing the signs as follows:

$$LPCIG = 2.200579LTEDU - 0.151454LREE - 0.412561LCEE + 0.705404LPED + 0.000804LGFCF$$

The result above implies that there is a positive and significant relationship between human capital and inclusive growth in the long run. A one percent increase in human capital leads to a more than proportionate increase in inclusive growth by about 2.2 percent. This means that a positive long

run relationship between human capital and inclusive growth exists in Nigeria. This goes in line with a priori expectation, as human capital and inclusive growth is supposed to have a positive long term relationship.

There is a negative and insignificant relationship between public recurrent education expenditure and inclusive growth in the long run. A one percent increase in the public recurrent education expenditure will lead to a less than proportionate decrease in inclusive growth by about 0.15 percent. This goes against a priori expectation, as an increase in public recurrent education expenditure is expected to bring a positive change to inclusive growth.

The result above implies that there is a negative and insignificant relationship between public capital expenditure on education and inclusive growth in the long run. A one percent increase in public capital expenditure on education leads to a less than proportionate decrease in inclusive growth by about 0.41 percent. This goes against theory and a priori expectation, as capital expenditures such as building additional schools, is expected to have a positive relationship with inclusive growth, especially in the long run.

There is a positive and significant relationship between the total government education expenditure as a ratio of total government expenditure and inclusive growth in the long run. A one percent increase in the ratio of government education expenditure to total government expenditure will lead to a more than proportionate increase in inclusive growth by about 0.71 percent. This goes in line with the a priori expectation that an increase in the proportion of total public expenditure allocated to the education sector will promote inclusive growth.

The result above implies that there is a positive and significant relationship between gross fixed capital formation and inclusive growth in the long run. A one percent increase in gross fixed capital formation leads to a more than proportionate increase in inclusive growth by around 0.0008 percent. This means that a positive long run relationship between gross fixed capital formation and inclusive growth exists in Nigeria. This goes in line with a priori expectation, as gross fixed capital formation and inclusive growth are supposed to have a positive long term relationship. This means that an increase in the physical capital of Nigeria has a positive effect with inclusive growth.

#### 4.4 Vector Error Correction Model

The presence of at least one co-integrating relationship between the variables means that the restricted VAR (VECM) should be used for the estimation. The VECM is used to estimate the relationship that exists between the variables in the short run, and reconciles the short run behaviour with the long run equilibrium. In other words, it restricts the long run behaviour of endogenous variables to incorporate short run disequilibria. The short run deviations are corrected through series of adjustments. The stability condition of the VECM can only be satisfied when the coefficient is negative sign and lies between 0 and 1, with a t-statistic that is greater than two to ensure statistical significance. The coefficient of the error term has a negative sign and is statistically significant for this model. This shows that there a long run convergence between inclusive growth and the independent variables.

Note: T-statistic values are in [ ]

Source: Author's Computation using E-views 7.

The results of the estimation give the short run relationships among the variables. The result reveals that though the coefficient of all the independent variables lie between 0 and 1, only LPCIG and LGFCF are negative. It also reveals that of all the independent variables, none is statistically significant. This implies there is no meaningful error correction taking place in the isolated independent variables; LTEDU, LREE, LCEE, LPED and LGFCF. The result confirms the positive relationship between LTEDU, LCEE, LPED, LREE, LGFCF and inclusive growth. The result showed that a positive relationship exists in LTEDU in relation to inclusive growth in the short run. The coefficient shows that 88.7 percent of errors in the current period will be corrected in the subsequent period respectively which implies a more than average speed of adjustment. The result of the estimation shows that the explanatory variables account for about 75.49 percent of the variations in inclusive growth.

### **Summary of Findings**

The analysis was carried out mainly to investigate the relationship between education expenditure and inclusive growth in Nigeria. All variables were revealed to be stationary at first difference. The Johansen co-integration and VECM results reveal that there is a positive and significant relationship between human capital and inclusive growth in the long run, which goes strongly in line with a priori expectations. Gross fixed capital formation and ratio of public expenditure on education to total government expenditure also showed a positive relationship, while total recurrent expenditure of government on education and total capital expenditure of government on education showed a negative relationship in the co-integration.

Tertiary enrolment rate, total recurrent expenditure of government on education, total capital expenditure of government on education, gross fixed capital formation and ratio of public expenditure on education to total government expenditure showed a positive relationship in the VECM. In the VECM, none of the independent variables were significant. This means that human capital positively influences inclusive growth in both the short and long run, while total capital expenditure of government on education and total recurrent expenditure of government on education negatively influences inclusive growth in the long run, but positively influences growth in the short run. The results also showed that gross fixed capital formation and ratio of public expenditure on education to total government expenditure positively influences growth both in the short and long run. While working papers on inclusive growth have claimed that a positive relationship exists between human capital and inclusive growth, this research accepts that inference and supports government's expenditure on education as well as the human capital itself. Hence, all the null hypotheses of this study should be rejected.

### **6. Policy Implications and Recommendation**

The positive impact of human capital on inclusive growth conforms to the Lucas endogenous growth theory. This study emphasised quantity and quality of human capital. Hence, human capital is an important factor for the attainment of inclusive growth in Nigeria. Nigeria has the potentials and opportunity due to the high revenue from oil, but has not engaged these potentials and opportunities

into creating an inclusive growth procedure. The nation needs to restructure the educational system for growth. These issues can be accessed through: increase in budgetary allocation to meet the world standard of 26 percent of the annual total budget to the education sector; the restructuring of the academic curriculum at each level of education to include more applied, vocational and practical courses; increasing the quality and quantity of the faculties in these institutions; increasing the quantity of these tertiary institutions; the introduction of the concept of continuing education (education for all ages) and promotion of research, innovation and development through the construction of research and development centers in all tertiary institutions.

The result shows a negative and significant relationship between public capital expenditure on education and inclusive growth, while a negative and insignificant relationship between public recurrent expenditure on education and inclusive growth. Also, a positive and significant relationship exists between total government education expenditure as a ratio of total government expenditure and inclusive growth. As earlier stated, access to education does not necessarily guarantee enrolment. Actual and opportunity costs have great impact on tertiary level education in Nigeria. Though the goal of primary education for all is yet to be achieved, the policy has contributed to the increase in enrolment at all levels. Hence, if this policy is introduced at the secondary and tertiary level, it may bring a remarkable change. These policies if properly applied to the economy will spur an increase in the level and quality of human capital in the economy, which will translate to inclusive growth.

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