

Human capital development and inclusive growth: Implications for achieving SDG-4 in Nigeria

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Abstract

Background: This paper examines the relationship between human capital and inclusive growth and how it can be a viable tool for driving the achievement of the Goal-4 of the United Nations Sustainable Development Goals (SDGs). Additionally, the study shows that the attainment of SDG Goal-4 can generate more inclusive type of growth through quality education (human capital development).

Methods: The study employed annual data from 1981-2015 from the National Statistical Bulletin (2015) and the World Development Indicators (2015). It uses the Error Correction Mechanism (ECM) and Johansen co-integration estimation techniques.

Findings: The result shows that human capital is statistically significant and has a long run relationship with the measure of inclusive growth.

Conclusion: The paper concluded that the tools indicated under the SDG-4 can help government produce a more inclusive growth through the channel of quality education, skill acquisition and human capital development.

Keywords: Human capital development, Inclusive growth, Sustainable development goals, education, Johansen co-integration

Introduction

Growth in Sub-Saharan Africa (SSA) in general and Nigeria in particular had been steady in the past years after the recession. However, high level of inequality coupled with “jobless growth” continue to threaten the sustenance of this growth pattern. This has prevented most of the benefits of growth experienced from reaching the poorest category of the continent (Wright, 2017). A growth that does not produce jobs and develop the economy at the expense of the environment cannot be sustained (Alege, Adediran & Ogundipe, 2016; Samuel, Ajayi, Idowu & Ogundipe, 2016; Okorie, Loto and Omojola, 2018; Akinyemi, Osabuohien, Alege & Ogundipe, 2017). Thus, sustainable growth must be inclusive in terms of reducing inequality and poverty. This inclusive growth entails growth that provides gainful employment for individuals that is made possible through education and skill development. It emphasises equality in access to essential social services which include education and health that enhances overall well-being. Health and education are two components usually used to indicate an individual’s productivity (Amodu, Alege and Oluwatobi, 2017; Matthew, 2011).

Poverty and inequality represents the most significant barriers to achieving sustainable development in Africa (Wright, 2017), there is

equally the challenge of sustainable governance (Gberevbie & Oviasogie, 2012). Access to quality education that improves the value of human capital can, thus, be a viable tool for overcoming these barriers. The development of the human capital endowment of a country is an important pre-requisite for a country’s socio-economic and political transformation (Eigbiremolen *et al.*, 2014). This points to the fact that developing human capital is crucial for success in attaining inclusive growth for sustainable development. Furthermore, human capital development is one of the greatest catalysts for the improvements of the standard of living of the population (Adelakun, 2011). This development of human capital is beyond the measurement of the intellectual capacity of an individual, but rather involves the improvements in the level of productivity of the individual (Matthew, 2011).

In recent times, the Nigerian economy has been recognised as one of the fastest growing economies in Africa and the world, in terms of having nominal Gross Domestic Products (GDP) of about US\$568 billion and an average annual growth rate of 6.2% (World Development Indicator, 2015). Furthermore, the Nigerian economy accounts for around 55% of the West African GDP, 35% of Sub-Saharan Africa’s GDP and one-fifth of the African population. As a

result, 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 as poverty and unemployment are increasing and the inequality gap is widening. Investment in education in Nigeria had also been found to be insignificant and fall below the acceptable benchmark of the United Nations (Jaiyeoba, 2015). Therefore, there is need for current studies that can account for better economic growth that is inclusive in developing countries, bearing in mind the provisions of the United Nations Sustainable Development Goal Number 4.

In the specific case of Nigeria, the economy grew at a fairly decent rate of over 6% between 2009 and 2014 (Central Bank of Nigeria Statistical Bulletin, 2014). However, the poverty rate in the country has risen from 52% in 2004 to 61 percent in 2010 (Ogbu, 2012). Alongside this, income inequality has been widening and the top 10% income earners are responsible for about 43% of total consumption. As stated by Bhagwati (2011); Fayomi, *et al.* (2014) and Nzabona and Ntozi (2017), economic growth is a reliable way to lift the poor out of poverty. Economic growth is expected to assure the poor of productive employment, which would increase their incomes that will enable them increase their expenditures, especially on health and education. In contrast to this, Nigeria is yet to experience such transforming growth as the economy is plagued with increasing unemployment and stagnant low incomes (Adediran, Amoda & Adebayo, 2016; Egharevba, 2017; Amodu, Alege and Oluwatobi 2017; Sodipe & Ogunrinola, 2011). The presence of stagnant and low income has prevented an increase in expenditure, especially on health and education. Although, there has been an improvement in the access to health and education in Nigeria, the quality has declined drastically. Redistribution policies have been set to increase the assets of the poor, but they have not been significantly positive.

In the same vein, there is an implicit belief that the basic goal of inclusive growth is to pursue a strategy that would account for the inclusion of the economically and socially marginalised sections in the mainstream economy. Inclusive growth as a concept is beneficial because, it promotes high and sustainable growth to create productive and decent employment opportunities for the masses, it promotes social welfare and accelerates the realisation of human abilities and potentials, improvement of well-being,

strengthening of economies, prompts sharp reduction in poverty promotes socioeconomic stability and peace, and create accessible to everyone. It is in the light of this that this study set out to investigate the relationship between human capital and inclusive growth and how it can be a viable tool for driving the achievement of the Goal-4 of the United Nations Sustainable Development Goals (UN-SDGs). This is a point of distinction from previous studies.

Literature review

There have been previous studies on the link between human capital development and economic growth (for example, Mba, Mba, Ogbuabor & Ikpegbu, 2013; Eigbiremolen *et al.*, 2014; Jaiyeoba, 2015; Omotayo, 2015); however, a sparse literature exists on how the development of human capital through education can help government achieve a more inclusive growth. A few of these studies and their key findings are examined. For instance, Mba *et al.* (2013) evaluated the relevance of human capital development in the growth process of the Nigerian economy and discovered that a positive relationship exists between human capital development and economic growth. The study asserted that human capital development and expenditure on human capital and inclusive growth are crucial elements for sustainable economic development.

Omotayo (2015) observed that an increase in the allocation to human capital will lead to an increase in GDP, showing a high significant and positive relationship between the investment in human capital and economic growth in Nigeria. Also, Kanayo (2013) indicated that investment in human capital has the potential to accelerate economic growth, further emphasising that capital expenditure does not significantly impact economic growth which may be due to the low utilisation of expenditure in Nigeria. This is similar to the findings of Campbell and Agbiokoro (2014) that real government expenditure on education positively and significantly impacts the aggregate growth of the Nigerian economy. An amazing discovery of this study was that Solow's hypothesis of high population growth/low productivity relationship is not applicable in the Nigerian economy. Evidence from the work of Arabi and Abdalla (2013) showed that the quality of education is a major determinant of economic growth and the highly educated individuals have more influence on economic output than the secondary educated ones. In terms of health interaction, Jaiyeoba (2015) found a long-run relationship to exist between government expenditure on

education, health and economic growth in Nigeria.

However, Ditimi and Nwosa (2011) found absence of causality between human capital development and economic growth in Nigeria which contrasts with the theoretical argument of Lucas (1988) and it also contrasts with the outcome of empirical analysis of studies from the Western economies. The reason for this non-causality may be due to the successive decrease in the budgetary allocation to both education and health sectors. In terms of inclusive growth prospects, Ogujiuba and Alehile (2011) identified some of the challenges inhibiting inclusive growth in the Nigerian economy, which include economic instability and policy reversals, macroeconomic policy inconsistency, pervasive rent-seeking and corruption facilitated by government being the hub of economic activities, conflicts of macroeconomic policy goals and the rest. Some of these challenges are institutional while the rest are as a result of disharmony between goals and means.

Several of the empirical literature reviewed confirmed that a positive relationship does exist between human capital and economic growth, but studies testing the relationship between human capital and inclusive growth and how it can be a viable tool for driving the achievement of the UN-SDG number 4 is still sparse, especially in Nigeria. Also, there was no emphasis on the welfare implications of the relationship between human capital and economic growth. As a result of this, the paper seeks to fill that gap in the literature with the use of the inclusive growth concept.

Until very recently, the GDP of Nigeria had been growing at an average of 6.2% per annum, but with this growth, the Poverty headcount ratio at US\$2 a day (PPP; percentage of population) has still been ranging from 75-88% (World Bank, 2015). The Gini index that is used to measure inequality has also been ranging from 0.4 to 0.47 since 1980. The unemployment rate has equally been high and has been ranging from 20-24% (CBN Statistical Bulletin, 2014). Nigeria's poverty rate, inequality rate and unemployment rate are high and correlated with growth rate. The economy is seen as growing outside its people as only the economy is experiencing buoyancy, 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 is creation of employment opportunities that will thereby reduce the unemployment. An increase in employment will therefore increase

income and standard of living, which will in turn reduce poverty and inequality.

Education as a segment of human capital can be measured using the gross total tertiary school enrolment rate. The gross tertiary school enrolment rate has been fluctuating, but has been experiencing increase at a very slow pace. For instance, in 1970, the enrolment rate stood at 0.13%, it was 1.83% in 1980, while as at 1990, it was 4.28%. It rose to 7.45% in 2000 and by 2013, the enrolment rate was 13.40 percent. The 2014 Human Development Report ranked Nigeria 152 out of 187 countries, with a Human Development Index of 0.50. Nigeria is also one of the top five countries that harbours 7% of the world's poor. In analysing the trend of inclusive growth in relation to the trend of human capital, it is evident that as the gross enrolment rate was increasing, growth was becoming more inclusive. In 1990, while the tertiary school enrolment rate was 4.28 %, the inclusive growth index was 4, but in 2010 when the tertiary school enrolment rate increased to 12.26 %, the inclusive growth index was 4.85. Therefore, as human capital development was occurring, growth became more inclusive. From the trend analysis, it's evident that a positive relationship exists between human capital and inclusive growth, and theoretically the Lucas model of endogenous growth states that the 'engine' of growth is human capital, this is due to the fact that, human capital accumulation can raise the productivity of both labour and physical capital.

Data and methods

Data sources

The data employed for this study are annual data from 1981 to 2015 and they were sourced from the Central Bank of Nigeria Statistical Bulletin (2015) and the World Bank World Development Indicators (2015). These datasets are adequate and contain data on the variables for Nigeria as it pertains to the objectives of the study. The study also used estimation techniques in achieving the stated objectives. These includes performing a unit root test for stationarity of the series, Johansen test to test for co-integration and the VECM for short run dynamics. The model and estimation procedures are further explained below.

Method (model specification)

The study employed the Lucas endogenous growth model, which is an extension of the neoclassical growth model, and incorporated the positive externalities related to the accumulation of human capital. It adopts a production function of the neoclassical growth model type, as

suggested by Lucas (1988). This model explains the link between human capital and economic growth. Hence, it is specified as follows:

Where; Y represents output, A is technological change, K represents capital input and L is labour input.

This model gives the theoretical framework for this study. Hence:

The coefficients α and $\alpha-1$ represent the allocation of human and physical capital factor payment in total production. The model assumes an increasing returns to scale on production, in that $\alpha + \alpha-1 > 1$. As consistent with the literature, the two main assumptions on which the model stands include: that the economy has two sectors; 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 labour-saving route (Easterly & Levine, 2001). The natural logarithm of all variables was used and the model was specified using the Cobb-Douglas production function. Given this theoretical relationship, the model is specified as a functional relationship as follows:

Where;

PCIt: Per Capita Income Growth (Proxy for Inclusive Growth Rate), TDUt: Tertiary School Enrolment Rate, REEt: Recurrent Expenditure on Education, CEEt: Capital Expenditure on Education, PEDt: Public Expenditure on Education and GFCT: Gross Fixed Capital Formation.

The econometric logged form of the model is given as:

Estimation technique

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 so as to be able to check for error correction between time series variables in the short run.

Results

The study began the estimation procedure by testing for unit root stationarity in the variables using the Augmented Dickey-Fuller (ADF) test. The results of the unit root test are presented in Table 1. 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 at 1%, 5% and 10% level of significance and if it is lesser, the null hypothesis is accepted. The variables LPCI, LTDU, LREE, LCEE, LPED and LGFC, when integrated of order $I(1)$, the ADF test statistics in absolute value are greater than their critical values at 1% and 5% 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 paper because all variables are stationary at first difference.

Then, in order to ensure the existence of a long-run relationship or otherwise between the variables of interest, the Johansen Co-integration test was 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 questions this paper seeks to answer. The results of the co-integration rank tests presented in Tables 2 and 3 reveal that there are three co-integrating equations for the Trace statistic at the 5% level of significance. The result also revealed that there is one co-integrating equation for the Maximum-Eigenvalue statistic at the 5% level. This paper also employs the use of the Maximum-Eigenvalue statistics in its interpretation.

Table 1: Augmented dickey-fuller (ADF) tests for unit roots

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

Table 2: Unrestricted co-integrating rank test (trace statistics) Trace statistics

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Probability
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 one 1 co-integrating equation (CE) at 0.05 level of significance

Table 3: Unrestricted co-integrating rank test (maximum eigen) Maximum

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Probability
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

*Maximum eigen indicates one 1 co-integrating equation at 0.05 level of significance

Table 4: Johansen normalised co-integrating coefficients

LPCI	LTDU	LREE	LCEE	LPED	LGFC
1.000000	-2.200579	0.151454	0.412561	-0.705404	-0.000804
	[-2.94562]	[0.99014]	[4.77990]	[-3.94246]	[-0.00847]
LPCI = 2.200579LTDU - 0.151454 LREE - 0.412561LCEE + 0.705404LPED + 0.000804LGFC (v)					

The normalised co-integration result is presented in Table 4 and is shown in its implicit form, hence to make it explicit; it is rewritten by changing the signs. The explicit form is given by equation (v). The result in equation (v) implies that there is a positive and significant relationship between human capital and inclusive growth in the long run. In other words, a 1% increase in human capital leads to a more than proportionate increase in inclusive growth by about 2.2%. 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 expected to have a positive long term relationship. In relation to other variables in the model, a negative and insignificant relationship was observed between public recurrent education expenditure and inclusive growth in the long run. This is because a 1% increase in the public recurrent education expenditure led to a less than proportionate decrease in inclusive growth by about 0.15% since the variable carried a negative sign. In the same vein, there was a negative and insignificant relationship between public capital expenditure on education and inclusive growth in the long run; where a 1% increase in public capital expenditure on education led to a less than proportionate decrease in inclusive growth by about 0.41%.

In relation to the variable of total government education expenditure as a ratio of total government expenditure, a 1% increase resulted in about 0.71% increase in inclusive growth. 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. Similarly, a 1% increase in gross fixed capital formation showed a more than proportionate increase in inclusive growth by about 0.0008%. This means that a positive long run relationship between gross fixed capital formation and inclusive growth exists in Nigeria. This is 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. The next section explains the results of the vector error correction model.

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. The stability condition of the VECM can only be satisfied when the coefficient is negative in sign and lies between 0 and 1, with a t-statistic that is greater than 2 to ensure statistical significance. The results which are presented in Table 5 shows that 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.

Table 5: Estimation of Error Correction Mechanism (ECM)

Error Correction	D(LPCI)	D(LTDU)	D(LREE)	D(LCEE)	D(LPED)	D(LGFC)
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, Adjusted R-Squared 0.665818, F-statistic 8.471424

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 LPCI and LGFC 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; LTDU, LREE, LCEE, LPED and LGFC. The result confirms the positive relationship between LTDU, LCEE, LPED, LREE, LGFC and inclusive growth. It implies that a positive relationship exists in LTDU in relation to inclusive growth in the short run. The coefficient shows that 88.7% of errors in the current period will be corrected in the subsequent period respectively which implies a more than average speed of adjustment. The R-square value of 0.754933 from the estimation imply that the explanatory variables account for about 75.49% of the variations that occur in inclusive growth.

Discussion

The paper analysed the relationship between human capital and inclusive growth in Nigeria and how it can be a viable tool for driving the achievement of the United Nations Sustainable Development Goal-4. This is a distinction from previous studies (e.g. Ditimi & Nwosa, 2011; Matthew, 2011; Mba *et al.* 2013; Eigbiremolen *et al.*, 2014; Jaiyeoba, 2015; Omotayo, 2015). Hence, using data sourced from CBN Statistical Bulletin (2015) and World Bank World Development Indicators (2015), all variables were revealed to be stationary at first difference. The Johansen co-integration and VECM results earlier presented revealed 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 expectation. 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. However, 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 previous studies such as Ogbu, 2012; Mandlebe, 2014; Adediran *et al.* 2016; Wright 2017 on inclusive growth have claimed that a positive relationship exists between human capital and inclusive growth, this research accepts that inference but favours government expenditure on human capital.

The study highlighted that a unique feature of the educational system in Nigeria is that the gap between the three levels of education (primary, secondary and tertiary) has been virtually constant, however, access to education does not necessarily guarantee enrolment. While the goal of 'primary education for all' is yet to be fully achieved, the policy has contributed to the increase in enrolment. Thus, if this policy is introduced at the secondary and tertiary level, it could influence a remarkable change. While the authors considered the policy as a good one, it may be difficult to achieve due to the financial status of majority of the population, unless it is subsidised which creates the challenge of funding. There is, therefore, need for government spending to promote human capital in Nigeria. The promotion of human capital has remarkable effects in that it will make the people more skilful and create employment for the populace, thereby ensuring a constant source of income for them which will then raise them from poverty and narrow the inequality gap in the economy.

In the same vein, government can invest in human capital to promote inclusive growth through the following ways: (i) allocating up to 26% of the annual budget and 7% of the GDP in the education sector as specified by United Nations Educational, Scientific and Cultural Organisation (UNESCO); (ii) reduction in the level of corruption, bureaucracy and red tapism

of officials in the sector; (iii) promotion of academic financing methods such as student loans, bursaries and award to encourage enrolment; (iv) yearly award of scholarship to the poor, promising and academically excellent students to promote scholarship; (v) economic empowerment of families; (vi) increase in the allocations of fund to research and development; (vi) construction of functioning libraries at every local government; (vii) construction of research and development centers at every local government. 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 in inclusive growth. Furthermore, it can assist government in meeting the targets of the newly popularised Sustainable Development Goals (SDGs) which encourages all developing economies to seek to ensure inclusive and equitable quality education and promote life-long learning opportunities. This is contained in the Goal 4 of the SDG.

Conclusion and recommendations

This paper empirically analysed how the imperatives of the SDG-4 can be used to produce a more inclusive growth in Nigeria through the channel of quality education and human capital development. The estimation procedures found human capital development to positively influence the measure of inclusive growth in both the short and long run. This may however be achieved through access to quality education. The authors consider that the promotion of academic financing methods such as student loans, bursaries and awards would have great potential to boost or encourage school enrolment. It is however recommended that policies to increase the proportion of total public expenditure could influence a boost in education for plausible promotion of inclusive growth. These policies, if properly applied could spur an increase in the level of human capital in the economy, which will translate in inclusive growth.

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