

Determinants of Human Capital Development: Policy Implication for Economic Growth in Nigeria

Jonathan O. Oniore & Uju V. Okoli

¹ Department of Economics, Bingham University, Karu, Nigeria

² Department of Economics, Nnamdi Azikiwe University, Awka, Nigeria

Correspondence Email: jonathanoniore@gmail.com

Abstract

Most theoretical studies like the endogenous growth theory have shown that countries and regions which invest heavily on human capital development should expect higher growth rates than areas with inferior levels. Understanding and addressing challenges related to human capital is thus fundamental to short term stability as well as the long term growth, prosperity and competitiveness of nations. Motivated by this understanding, the study explored simultaneously, several structural and institutional factors that may influence human capital development and its policy implication for economic growth in Nigeria. The Dynamic Ordinary Least Squares (DOLS) was adopted as analytical technique. The estimated DOLS results showed that the significant determinants of economic growth are largely from human capital development, public expenditure on health, infrastructures and democratic governance. The research therefore, suggested provision of sectoral policies, especially educational and health policies that are not only pro-people development, but create the income and welfare enhancing opportunities needed to boost human development. There is need for government to look for other stable sources of financing infrastructures in Nigeria because the reliance on crude oil revenue has brought about fluctuation in infrastructural development which has negative effect on economic growth. Good example of other sources of financing infrastructures is the recent sovereign Sukuk bond by the Federal government to raise funds through the non interest capital market. The Sukuk issue is targeted at infrastructure development and financial inclusion.

Keywords: Health; Schooling; Human Capital; Economic Growth; Policy Designs

JEL Classification: I15, I25, E24, O40, E61

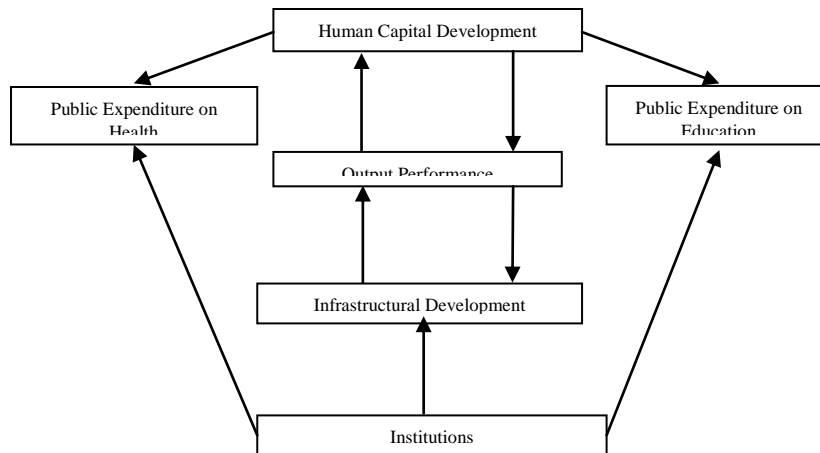
1. Introduction

Human capital contribution to economic growth cannot be over emphasized. Many countries recognize the positive effects of human capital and are making concerted effort to invest in this sector so that the nation can benefit from the development of human resources. (Wolff, 2000). It was opined in the early theories of human capital that investment in training and education serves as a means of developing human capital (Schultz, 1961; Berker, 19664). Attention was drawn to this fact by Lucas (1988) and Romer (1990) through their theory of endogenous growth. In their theory, they proved that, with increased development of human capital, regions and countries should expect a higher level of growth over countries which have a lower developmental rate of

human capital. In another strand of literature, it was observed that human capital development can be improved through effective healthcare services (Oster, Shoulson, & Dorsey, 2013). In the 2013 Human Capital report of World Economic Forum revealed that with effective utilization of human capital as a growth determinant, economic sources are more guaranteed than the utilization of any other resources.

The Sen's capability approach provides the theoretical base for the postulations above (Sen, 1979; 1999) which states that "the capability of an individual to have multiple functioning vectors and to benefit from the attached wellbeing achievement" to be the most preferred welfare indicator. The development analysis shifted because of this perspective, the development analysis shifted to the vector of attributes like education, income, health and also the vector of possible opportunities that might be available to individuals; less choices are available to an individual who is uneducated or starving than an individual who is educated and healthy. The implication of this is that education might not be the only driver for the transformation of an economy. The quality and quantity of investment (foreign and domestic) attached with technological choice, the nature of policies which collectively are the relevant determinants of economic performance. Relevance is attached by the capability approach to the part played by the institutions on the development of human resources (Sen, 1999). As observed by De Muro and Tridico (2008), the connection between human development and institution are complex. This is because human development is a multi-dimensional concept. Developmental policies and institutional policies together make development less uneven, and for all, create even development opportunities so as to improve the living standard. The purpose of development is to enhance the lives of the people through the expansion of individual capabilities such as to be well nourished and healthy, to participate in community life and to be knowledgeable. The fundamental focus of development, therefore, is to remove obstacles that limits the capabilities of individuals, these include ill health, illiteracy, lack of political or civil freedom, lack of access to resources (Sen, 1999). The diagram below depicts human development potential drivers.

Figure 1.1: Potential Human Capital Development Drivers



Source: Adapted from Shuaibu and Oladayo (2016)

From figure 1.1 above it can be observed that welfare is impacted by attainment of education through labour capacity improvement on the aggregate output. Public spending inclusion on education has been pursued in many empirical studies (Pelinescu, 2015; Maazouz, 2013). Public spending on health care and education are expected to have a positive impact on human capital through economic performance. The development of human capital is positively influenced by institutions through its impact on the fiscal policy discipline and also as efficient channel for resources which are directed towards the development of infrastructure (Shaibu & Oladayo, 2016). Quality institutional structure plays a significant role in enhancing the capabilities of the people and also the rate of productivity in the country. This is observed to be so because effective institutional structure creates equitable opportunities for development (De muro, Tridico, Balcerza & Pietzak, 2016). Through the provision of relevant and indispensable services, infrastructure can have a direct significant impact on the development of human resources. This direct impact could be through services such as electricity and drinking water; it could also have indirect impact which could be experience through the enhancement of economic growth, creating opportunities for new income to be earned for the vulnerable group in the society and also strengthen governance (Sapkota, 2014). The two most important sources of human capital are education and health; health capital and knowledge capital. As a matter of fact, these two variables are the major determinants and also the most needed factors for economic development and growth. In Nigeria, and as in other developing countries, it is rather unfortunate that the state of health services in the country and other health infrastructure are in devastating state. For instance, the public expenditure expressed as the percentage of the total health expenditure increased from 25.03% - 29.11% between 2005 and 2009. Its peak was reached between 2005 and 2009 with the accompanying percentage value of 32.62% and dropped to 29% between 2010 and 2014. Again, the value of public expenditure on health increased marginally to 3.57% and 3.63 in 2015 and 2016 respectively (WHO). The poor performance of the value of public health expenditure which is one of the indicators of human capital development is in view of Schultz (1999) submission, that many countries in Africa, including reports from Nigeria indicated that the country has weak education and health indicators as compared with many other places around the world.

In the past, many governments in the country have adopted various plans for development which include 7 Points Agenda, Vision 2010, National Economic Empowerment and Development Strategy (NEEDS), Millennium Development Goals, Vision 20:2020 and one which is recently drafted, Economic Recovery and Growth plan (ERGP). The ERGP is structured to be a medium term developmental plan with primary focus of restoring growth, human resource investment, and charting the course for a competitive global economy. These are in order to allow the people and the nation to progress and achieve the needed economic development and growth. Despite the cumulative policy efforts of over 50 years, indicators of human capital development such as rate of life expectancy, education expenditure by the public sector, enrolment in primary education and expenditure on health by the public sector remains abysmally low. For example, in educational attainment, the country ranked 118th with a male to female ratio of 0.85 for literacy, 0.86 for the enrolment in secondary school, 0.85 for primary and 0.55 for tertiary (Human Development Report, 2009). Moreover, it is dismal to note that Nigeria is the third poorest country in the world with over 80 million populations living below the poverty line (Global Wealth Report, 2015). More recently, Nigeria has been named by the world poverty clock as the world poverty capital. According to the world poverty clock in June, 2018, eighty-seven (87) million people are living in poverty and worst still, the amount of the extreme poor in the country has increased to 91.6 million. Half of the population in the country, by implication, is extremely

poor. Despite increase in the rate of investment in the country with respect to educational and health sector, the domestic economy is still regarded as underdeveloped as it is clearly observed by the indicators and indices of the human development; 2018 statistical update.

Table 1.1 presents the HDI trends in Nigeria based on the new goal post and the data of the consistent time series.

Table 1.1. Nigeria's HDI Trend Based on Consistent Time Series Data and New Goalpost

Years	Life Expectancy at Birth	Expected Years of Schooling	Mean Years of Schooling	GNI Per Capita (2011 PPP\$)	HDI Value
1990	45.9	6.7	N/A	2,792	N/A
1995	45.9	7.2	N/A	2,569	N/A
2000	46.3	8.0	N/A	2,451	N/A
2005	48.2	9.0	5.2	3,669	0.465
2010	50.8	8.4	5.2	4,862	0.484
2015	53.0	10.0	6.0	5,527	0.527
2016	53.4	10.0	6.2	5,326	0.530
2017	53.9	10.0	6.2	5,231	0.532

Source: UNDP 2018 Statistical Update

Table 1.1 reviewed the progress in Nigeria with respect to each of the indicators of HDI. Between 1990 and 2017, there was an increase in the Nigeria life expectancy at birth by 8.0 years, there was also an increase in the mean years of schooling by one year, the expected years of schooling increased by 3.3 years. There was an increase in the GNI per capita of the country by 87.4 percent from 1990 – 2017. On the same note, the HDI value for Nigeria in 2017 was 0.53 which put the country in the category of countries with low human development, making Nigeria, out of 189 ranking 157. The value of the human development in Nigeria increased between 2005 and 2017 to 0.532 from 0.465, this is an increase of about 14.4%. The progress of human development in Nigeria, as measured by the human development index can usefully be used for comparison with other countries. For example, a different degree of progress was actualized by Cameroon and Mauritania towards the increase in their Human development index. See Table 1.2 below.

Table 1.2: Nigeria's HDI and Component Indicator for 2017 Relative to Selected Countries

	HDI Value	HDI Rank	Life Expectancy at Birth	Expected Years of Schooling	Mean Years of Schooling	GNI Per Capita (PPP US\$)
Nigeria	0.532	157	53.9	10.0	6.2	5,231
Congo Democratic Republic	0.457	176	60.0	9.8	6.8	0,796
Ethiopia	0.463	173	65.9	8.5	2.7	1,719
Sub-Saharan Africa	0.537	-	60.7	10.1	5.6	3,399
Low HDI	0.504	-	60.8	9.4	4.7	2,521

Source: UNDP 2018 Statistical Update

From the table above, the 0.532 value of the human development index of Nigeria is higher than the average which was 0.504 for countries that are in the group for the low human development index, also the value is below the average for the countries that are in Sub-Sahara Africa. Countries that are close to Nigeria from Sahara African in the 2017 HDI rank are Ethiopia and DR Congo, in which their respective HDI ranks are 173 and 176. Motivated by the data, this study simultaneously explored several institutional and structural factors that can influence the development of human capital and its policy implication for domestic growth in the country. This implies that a step by step account of the factors that determines human capital development in words of Sidikat, Gafar, Mukaila and Samsudeen (2006) must be examined in order to give direction for policy reforms. Anything short of this implies that policies will be formulated blindly without the knowledge of which factor is stronger at improving human capital development; implication for the growth in the Nigerian economy.

2. Literature Review

2.1. Conceptual Issues

Concept of Human Capital Development

The classical school in 1776 is regarded as the root of the development of human capital as a concept. Human capital, as postulated by Schultz (1961) is one of the significant production factors that holds a significant role in the development of an economy. According to him, human capital is the stock of knowledge of production and skills which are possessed by workers to increase productivity. Human capital is also regarded as an important variable in improving the employees and assets of firms so as to increase the level of productivity and to equally sharpen the competitive advantage of the firm. Human capital is regarded as a tool which is used as an edge over other firms because it involves training, acquisition of knowledge, initiatives and many others. All these are for the acquisition of skills. The development of human capital is centred on the human because its main concern is connected to the empowerment of human which is expected to result in active participation. OECD (2001) observed that human capital is concerned with skills, knowledge, attributes and competitiveness which are embedded in an individual which influences the creation of social, personal and economic wellbeing.

2.2. Theoretical Literature

The Romer Endogenous Growth Theory

The model starts by assuming that the process of growth which is derived from the industry or the firm level. Each individual in the industry produces with constant return to scale, the model, therefore, is consistent with perfect competition and this seems to be similar to the Solow model assumption. The difference in the two model is that the Romer assumption postulates that the economy with the capital stock K affects the output positively at the industry level, in order to have increasing return to scale at the economy.

It is important to note that knowledge is part of the valuable capital stock of an industry. The firm's capital stock which includes knowledge is an important public good, as observed in the Solow model where there are spill over to the other firms in the economy. due to this, learning is treated in the model as learning by investing. The Romer model can be thought of as spelling out- endogen zing-the reason why the rate of investment determines the growth rate. From this simplification, abstract is drawn from the household sector, which is an important characteristic of the original model, this is carried out so as to focus on issues that relates to industrialization. Formally,

$$Y_i = AK_i^\alpha L_i^{1-\alpha} K^\beta \dots\dots\dots 1$$

For simplicity the study assumes symmetry industries, with this, the same level of labour and capital is utilized by each industry. We then have an aggregate production function:

$$Y = AK_i^{\alpha+\beta} L_i^{1-\alpha} \dots\dots\dots 2$$

In order to make the endogenous growth stand out, the study assume that A is constant instead of increasing over time; this means that the study assume for the mean time that there is no progress in technology. It can be shown, with little calculation, the per capita growth rate in income in the economy is going to be

$$g - n = \beta n / (1 - \alpha - \beta), \dots\dots\dots 3$$

G in the model above is the rate of output growth and n is the rate of population growth. As in the Solow model, without spillover and constant return to scale $B=0$ and per capital income therefore will be zero. Romer model, however, assumes that combining the three factors including the externality of capital, $B>0$; thus $g-n>0$ and Y/L is growing. Endogenous growth is now created, not exogenously driven by productivity increases. If technological progress is allowed in the study, in such a way that in the Solow Model $\lambda > 0$, the rate of growth will increase to the same level. The Model of Romer functions at a very high level of abstraction. In as much as the limits of the older mathematical models were overcome a number of simplifying assumptions were made in his model if mathematics were to be managed for the production of result. One of the assumptions in the model is that supply and the population of labour is constant, the other is that the total human capital stock is fixed and the fraction of labour which is supplied to the market is equally fixed. It is important to note that neither of those assumptions is true.

Human-Capital Augmented Solow Model

As observed from the Solow model, the Mankiw/Weil/Romer introduced human capital with the simplest method possible. With the Solow model, they presented a simple extension with their influential contribution by introducing human capital as a separate input into the standard production function of Cobb Douglas with Harrod-neutral technological progress. The following form is taken in the model by the production technology is known as the human capital augmented Solow model.

$$Y_t = K_t^\alpha H_t^\beta (A_t L_t)^{1-\alpha-\beta}$$

In the model above, output is designated Y, the stock of human capital is H, capital is designated as K, the technological level is represented as A and L is raw labour. The exponents α, β and $1 - \alpha - \beta$ is adopted in the study to measure the output elasticity to their corresponding inputs. Mankiw/Weil/Romer in the model assumes that $\alpha + \beta < 1$, in order for constant return to scale to be exhibited by the function and diminishing return to reproductive factors. Just as observed in the Solow model, the technological level and the population increase at the exogenous rate g and n respectively, on the other hand, the depreciation of capital at the rate δ . Three (3) other relevant assumption were made by Mankiw/Weil/Romer, these assumptions include; Just as people invest in physical capital they also invest in the human capital; this means that, by sacrificing consumption and spending a fraction of their income towards human capital accumulation; That is, at the same constant rate, there are depreciation of

human capital just as there are in the physical capital; That output can be adopted either for investment or for consumption in capital.

Summarily, the Solow model augmented human capital deals with human capital as an additional input in the production process. Just the way physical capital is modelled, the human capital is exactly modelled same way. To accumulate the human capital, a fraction of income is invested in its production and it depreciates at the same level as physical capital.

2.3. Empirical Issues

An investigation was carried out by Ravallion (1991) on the impact of expenditure by the public sector on social services such as health services, infrastructure, and education on the development of human capital. The relationship of public provision of the social services as it relates to the development of human in developing nations was examined using several indicators such as health, education as human development proxy. The research findings from the study revealed that the expenditure by the public sector as it relates to the provision of social services had a good relationship with the development of human capital.

Bildirici, Orcan Sunal and Aylac (2005) carried out an analysis on the relationship between brain drain and capital growth in 77 countries. The study adopted the panel data which was obtained from 1999 – 2001 by employing ordinary least squares technique. From the study it was observed that growth is increased in developed countries through migration of people, but growth is slowed down in less developed countries. From the result it was also observed that adult literacy, index for education, schooling rate, per capita income, investment in education, average life expectancy and the rate of growth are significant and positively related to the human capital particularly in the countries that were studied.

Oketch (2005) in his study investigated the determinants of economic growth and human capital formation in African countries. This study was carried out by identifying the two-way link which exist between economic growth and the development of human resource which is produced through formal school, measured in terms of per capita, and between investment in growth and in physical capital. Estimates was carried out in the study in three structural system of equation by two stage least squares. In the study it was concluded that the source of labour productivity growth in African countries are high investment in human and physical capital. This research conclusion is similar to the study hypothesis that both physical and human investment is important if the continent is to reach industrial development.

Sidikat, Gafar, Mukaila and Samsudeen (2006) examined human development determinants in Sub-Sahara Africa. A set of cross country data and multiple regression was adopted in the study. The study result indicated that factors such as conflict, natural disasters, instability, external debt crisis and prevalence of HIV and the lack of access to water all negatively impacted on the development of human capital in the region. Consequently, the study recommended measures such as the provision of human security, human empowerment, and provision of stable macroeconomic policies, foreign debt forgiveness, fight against corruption and the prevention, management and treatment of HIV/AIDS as possible solution to human development in SSA.

Olanrewaju (2011) explored the child schooling determinants in the country. The measures of schooling outcome adopted in the study are school current enrolment and delayed enrolment. The reduced form relationship was adopted in the study for the male and female children within the rural and the urban households. The data collected for the study is the multiple indicator cluster survey of Nigeria, it was observed in the study that socioeconomic backgrounds of children are significant determinants of schooling with education of parents which is observed to be the most

important determinant. More schooling is desired for the children by the educated parents. From the decomposition analysis, it was observed that the way girls and boys are being treated in the household in the urban region contracts the gender gap in the enrolment, however this gap is widened in the rural areas.

Azhar and Hafeez (2012) carried out a study on the regional difference in the human capital; the Pakistanian case was examined by providing a descriptive analysis in different region regarding the human capital. For the four provinces of Pakistan, the study categorised 3 human capital such as urban, rural and overall are formed. Visible difference was observed in the study of the human capital situation between the urban and the rural areas in Pakistan. It was suggested in the study that human capital can be improved through the investment for the improvement of skills of workforce which will lead to the increased productivity of capital. This therefore means that more funds should be allocated to education and health sectors particularly in the rural areas for the development of human capital in the area.

Popescu and Diaconu (2014) examined the human capital determinants in Romania. A representative sample of 300 persons was collected from the North-eastern part of Romania. The determinants which were found in the study to be influencing the human capital includes work professional experience, the country specific, formal education, lifestyle, the state of health in the country.

Iyoboyi and Muftau (2014) in their study titled an assessment of the development of human capital in Nigeria through education utilized education as a proxy to examine human capital. In the study, secondary sources of data were adopted. These data were analysed with the aid of basic statistics. According to the study report, evidence was obtained that there are inadequacies of human capital development in the country and it is observed to be unable to galvanize the nation towards long term growth. The study concludes that it is important to lay emphasis on developing human resources in the country, this is with a specific reference to the country's system of education if the goal of generation of employment, alleviation of poverty and creation of wealth are to be reached.

Shobande, Odeleye and Olunka (2014) worked on human capital investment and economic development in Nigeria. The period covered in the study is from 1970 – 2011. In the study OLS method of analysis was employed, this also includes ADF, Johansen test of cointegration, Error correction method for the data analysis. It was observed in the study that a short run negative relationship exists between human capital investment and economic development in Nigeria. Research findings were considered significant because it is relevant to the present study as the findings were as expected.

Simko (2015) conducted a study on the human capital determinant. The Swedish municipal was studied by creating an index for the human capital which is based on creativity, education and health. In the study, the cross sectional regression was adopted and a very interesting result was obtained. The determinant which was observed to have the biggest impact on the human capital was cultural diversity which was closely followed by specialization in knowledge based on manufacturing.

An investigation was carried out by Jaiyeoba (2015) on the relationship between investment in health, education and economic growth in Nigeria. The study utilized time series data from 1982 – 2011. In the study, Johansen cointegration, trend analysis, OLS method was adopted. The study employed data on education and health expenditure, tertiary and secondary enrolment and the gross fixed capital formation. It was observed from empirical findings that a long run relationship

exists between the expenditure of government on health education and economic growth. The study recommended that policies should be structured by the authorities towards large scale investment in health and education.

3. Methodology

3.1. Model Specification and Data presentation

The study adopted a model which is predicated on the theoretical exposition of Mankiw, Weil, Romer (1992) and a modified model of Osoba and Tella (2017). The study model is slightly structured differently from the above mentioned in that the present day study takes into consideration the role of institutions and infrastructural development as the main drivers of the development of human capital. Based on the foregoing, the relationship existing between the development of human capital and economic growth is specified thus;

$$RGDP = f(HCD, PEE, PEH, INFRAS) \dots\dots\dots 4$$

Where:

RGDP = gross domestic product which is adopted as a proxy for economic growth

HCD = Human capital development proxied with human development index;

PEE = Public expenditure on education;

PEH = Public expenditure on health;

INFRAS = Infrastructure and this is captured by electricity consumption per capita (kWh);

In this study, the role of institution holds in the development of human capital is examined. Thus, equation (3.2) is modified to include a dummy variable as specified below:

$$RGDP = f(HCD, PEE, PEH, INFRAS, DUM) \dots\dots\dots 5$$

To estimate equation (3.3), we take the natural logs of both sides which will result in the following equation (3.4)

$$\ln RGDP = \beta_0 + \beta_1 \ln HCD + \beta_2 \ln PEE + \beta_3 \ln PEH + \beta_4 \ln INFRAS + \beta_5 DUM + \mu \dots\dots\dots 6$$

The dummy variable accounts for the role of institutions as major drivers of human capital development. Dummy 1 for years in which Nigeria had democratic governance and 0 for otherwise. Where μ denotes the white noise error term, In: logarithm, β_0 = autonomous parameter estimate and $\beta_1 \dots \beta_5$ = estimates of the parameter associated with the determinants of the development of human capital in Nigeria. Except the dummy, every variable in the model are expressed in logarithmic form. Also, every coefficient is expected to be positive. Secondary source of data was adopted in the study which were collected from the CBN bulletin, NBS and world development indicators. The data collected covers the period of 1981 – 2017.

3.2. Variables Justification

The development of human capital is measured by human development index and in the study it is expected to have a positive effect on the economic performance in Nigeria. In the steps of Bidirici et al (2004), it is expected that there will be a positive relation between human capital development and economic performance.

PEH and PEE respectively means public expenditure on health and public expenditure on education. These two input parameters are important for the sustenance of economic growth. Educational and health sector captures the impact of domestic absorption on economic development. The apriori expectation for the study is that there will be a positive relationship between economic growth and health expenditure and education expenditure (Mankiw, Romer,

Weil, 1992). In regards to measurement, the total expenditure on both sector was adopted in the study.

INFRA implies Infrastructure and electricity consumption per capita kWh is captured by this. The apriori expectation in regards to this variable is that it will be a positive function to growth (Sakota, 2014). In addition, with the complete assessment of state provided infrastructural facilities it is equally an important criterion for the development of human capital. As Ward (1999) observed, infrastructural services includes, roads, electricity, water and these are all important because social and economic infrastructure are important overheads that are key to economic growth.

Another precondition for the improvement of development of human capital is the presence of good governance and by extension economic growth. For instance, Sandstorm (1994) opines that good governance is reflected in the responsibility of the government to involve its citizens in the development decision that will affect their lives. Furthermore, accountability, transparency and openness is the responsibility of the government so as to be held responsible for their individual and collective actions and enhance the maximization in resource utilization (UNDO, 2000).

3.4. Estimation Technique

To carry out investigation on the existing relationship between the explanatory variables and the dependent variable, the following procedures were adopted by the study.

First, an investigation was carried out on the time series characteristics. The reason for this investigation is to determine the integration order. The study conducted ADF test on the variables which were used in the regression. This was carried out so as to know the integration order of the underlying series. The determination of the underlying properties is the objective, and to observe the process that generates the results and discuss the analysis accordingly afterwards conclusion will be presented based on the employed time series variables. The study further estimated economic growth equation using a similar methodology employed by Osoba and Tella (2017). Empirical test in the literature used various econometric specification with the associated econometric problems. Econometric problem like variable omission, bias, and non stationarity have not been taken care of to varying degrees in subsequent research as the studies on the country's development of human capital-growth nexus are scanty and few to the best of our knowledge. To overcome the issue of endogeneity/ simultaneity bias, the study adopted the dynamic OLS estimator which was engineered by Stock and Watson (1993). The DOLS estimator of the cointegrating regression therefore combines all variables in the level, in addition to lags and leads of values of the explanatory variables.

The DOLS approach is important and useful due to its ability to introduce dynamics in the specified model while controlling for bias in the model. Accordingly, the problem of endogeneity is anticipated which can make the estimated coefficient to be bias if it is not accounted for in the estimation procedure. To control this problem, estimation was carried out by OLS using the Newy and West (1987) Heteroscedastic and Autocorrelation Consistent covariance matrix estimator, it is observed that their standard errors are robust, ensuring the validity of the inferences which are made regarding the coefficients of the variables entering the regressors in levels. Eviews9.5 package was consequently employed to estimate the model. This is done by including 3 lags and 1 lead in the regressors.

4. Results

4.1. Time Series Properties of the Variables

It has been observed in econometric studies that macroeconomic and financial time series variables are non-stationary and usually non-stationary variables results into spurious regression result (Engel & Granger, 1987). Hence the stochastic properties of the variables were investigated using the ADF and the Philip perron tests. These test were adopted in the study to test for the consistency in the data and decide the best method to use in the study.

Table 4.1: Unit Root Test Result (Trend and Intercept)

Variable	ADF	Critical Values	Order of Integration	PP	Critical Values	Order of Integration
RGDP	-5.945	-4.297*	I(0)	-13.639	-4.244*	I(1)
HCD	-5.154	-4.253*	I(1)	-5.005	-4.244*	I(1)
PEE	-4.957	-4.356*	I(1)	-8.795	-4.244*	I(1)
PEH	-4.148	-4.297*	I(1)	-6.610	-4.244*	I(1)
INFRAS	-7.754	-4.244*	I(1)	-7.898	-4.244*	I(1)
DUM	-5.827	-4.244*	I(1)	-5.829	-4.244*	I(1)

NB: * Indicate stationary at the 1percent level and ** stationary at 5percent level

Source: Researchers Computation, 2019.

From the above table it can be seen that the ADF result suggest that the variables are non-stationary at level. They however appear to be stationary after first differencing them. Also the result of the PP revealed that the variables are non-stationary with the exception of RGDP variable which was seen to be stationary at level. All the variables however became stationary after first differencing them. The variables that were stationary were then used for the analysis. Next, the study presented the regression result which has been estimated from the Dynamic OLS.

Table 4.1: Results of DOLS Estimated Equation Dep Var = LOG (RGDP)

Variable	Coefficient	t-values	p-value
C	26.613*	4.619	0.00
LOG(HCD)	11.401*	5.452	0.00
LOG(PEE)	-0.591	-1.460	0.15
LOG(PEH)	0.354	0.866	0.39
LOG(INFRAS)	0.199	0.208	0.83
DUM	0.007**	4.619	0.01
R ²	0.84		
SER	0.994722		
Long-run variance	0.974185		

Note: *, showing significance @ 1 percent and ** 5 %. Each p-value is reported in square bracket.

Source: Researcher's Computation (2019).

From the above table it can be observed that the estimation equation depicts that long run significant determinants of economic growth are mostly from the development of human capital, public expenditure on health, infrastructure and democratic governance. In regards to the independent variables, the estimated coefficients and the corresponding t- statistic of the human capital development, public expenditure on health, infrastructures and democratic governance all acquired the expected signs, hence meeting up with the study apriori expectations of positive relationship. When viewed statistically, however, only human capital development and democratic governance captured by the dummy contributes to economic growth statistically. The corresponding t-value and the coefficient estimates of expenditure on education do not have the expected sign, by implication, this study finding is not consistent with the study expectation of positive relationship between economic growth and the expenditure on health.

The positive signs of variables like human capital development, public expenditure on health, infrastructures and existence of democratic governance, are clear indications that these variables matter with respect to economic performance. Expenditure on education is not really that relevant to the study outcome. This is because it negates the study a priori expectations. Factors such as, policy inconsistency, corruption, and political irregularities may account for this unexpected outcome. The goodness of fit of the DOLS estimate is adequate. About 84% in the variation in economic growth is due to changes in the regressors.

5. Conclusion and Recommendations

The two indispensable sources for the development of human resources are education and health; health capital and knowledge capital. But these indicators of human capital development in Nigeria have shown very poor outcomes. In view of this, Schultz (1999) noted that many countries in Africa, including Nigeria recorded weak education and health indicators as when compared with other countries in the world. This therefore means that it is important that the human capital be developed as it has been regarded as the engine of growth and development. It is against this background that the study attempted to offer a step by step examination of the factors that determines human capital development in order to proffer direction for policy reforms, if not policies will be formulated without complete understanding of the factors that are stronger in improving the development of human capital; economic growth policy implication in Nigeria.

The Dynamic Ordinary Least Squares (DOLS) was adopted as analytical technique. The estimated Dynamic OLS regression equation revealed that the long-run significant determinants of economic growth is largely from human capital development, public expenditure on health, infrastructures and democratic governance. But when viewed statistically, only human capital development and democratic governance captured by dummy contributes to economic growth statistically. The research therefore suggested provision of sectoral policies, that are not only for the development of the people but to also create money making opportunities and enhance welfare that are required for the development of the people. The Nigerian policy direction therefore needs to be focus on the reversal of the perceived infrastructural deficit, in such a way that the country will experience steady and stable economic development. Specifically, there is every need for government to search for alternative finance sources for the building and provision of infrastructural facilities in the country, this is because the reliance on crude oil revenue has brought about fluctuation in infrastructural development which has cause instability and brought negative effect on the growth of the country. Good example of other sources of financing is the recent sovereign Sukuk bond by the government to pull funds through the non interest capital

market. This issue is targeted at the development of infrastructure and financial inclusion in Nigeria.

6. Acknowledgments

We wish to appreciate all Authors that laid solid foundation in this strand of literature. No gain saying, we benefited greatly from their works. However, the views expressed here and any errors that may be found are entirely ours.

References

- Adedeji, A., Rasheed, S., & Morrison, M. (1990). *The human dimension Africa's persist economic crisis. United Nations Economic Commission for Africa*. Hans Zell Publisher, 377-391.
- Atalay, R. (2015). The education and the human capital to get rid of the middle income trap and to provide the economic development. *Procedia-Social and Behavioural Sciences*, 174.
- Azhar, K. M., & Hafeez U. R. (2012). Regional disparities in human capital: The case of Pakistan. *Pakistan Economic and Social Review*, 50 (1), 57-69.
- Balcerzak, A. P. (2009). Effectiveness of the institutional system related to the potential of the knowledge based economy. *Ekonomista*, 6.
- Balcerzak, A. P., & Pietrzak, M. B. (2016). Quality of institutions for knowledge based economy within new institutional economics framework. Multiple criteria decision analysis for European countries in the Years 2000–2013. *Economics & Sociology*, 9(4). DOI: 10.14254/2071-789X.2016/9-4/4.
- Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis with special reference to education*. National Bureau of Economic Research. New York; 2nd edition, NBER, New York, 1975; 3rd edition, University of Chicago Press, Chicago, 1993.
- Bildirici, M., Orcan, M. Sunal, S., & Aykaç, E. (2005). Determinants of human capital theory, growth and brain drain: An econometric analysis for 77 countries. *Applied Econometrics and International Development*, 5(2).
- Binder, M., & Georgiadis, G. (2010). Determinants of human development: Insights from state-dependent panel models. *Human Development Research Paper 2010/24*.
- De Muro, P., & Tridico, P. (2008). The role of institutions for human development. Retrieved from <https://www.researchgate.net/publication/228430665>
- Hamilton, J.D. (1994). *Time Series Analysis*. New Jersey: Princeton University Press.
- Iyoboyi, M., & Muftau, O. (2014). An assessment of human capital development in Nigeria through the lens of education. *International Letters of Social and Humanistic Sciences*, 35, 1-14.
- Ján Š, & Laura T̄ (2015). Determinants of human capital: A study on Swedish municipalities. *Jönköping International Business School*, Jönköping University, Sweden
- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3-42.
- Maazouz, M. (2013). Return to investment in human capital and policy of labour market: Empirical analysis of developing countries. *Procedia Economic and Finance*, 5(1).
- Newey, W., & West, K. (1987). Automatic lag selection in covariance matrix estimation. *Review of Economic Studies*, 61, 631–653.
- OECD (2001). Human Capital Investment: An International Comparison.
- Oketch, M.O. (2005). Determinants of human capital formation and economic growth of African countries. *Economics of Education Review*, 25, 554–564

- Olanrewaju, O. (2011). The determinants of child schooling in Nigeria. AERC Research Paper 217, *African Economic Research Consortium*, Nairobi
- Osoba, A. M., & Tella, S. A. (2017). Human capital variables and economic growth in Nigeria: An interactive effect. *Euro Economica*, 36 (1).
- Oster, E., Shoulson, I., & Dorsey, E. R. (2013). Limited life expectancy, human capital and health investments. *American Economic Review*, 103(5). DOI: 10.1257/aer.103.5.1977.
- Pelineseu, E. (2015). The impact of human capital on economic growth. *Procedia Economics and Finance*, 22(1). DOI: 10.1016/S2212-5671(15)00258-0.
- Popescu C. C., & Diaconu, L. (2014). The determinants of human capital in Romania. Retrieved from <http://steconomiceuradea.ro/anale/volume/2008/v2-economy-and-business-administration/069.pdf> on 10/09/016
- Ravallion, M. (1991). On hunger and public action. WPS 680, *Agriculture and Rural Development Department*, the World Bank
- Romer, P. (1990). Endogenous technological change. *Journal of Political Economy*, 98, 71-102.
- Sapkota, J. B. (2014). Access to infrastructure and human development: Cross country evidence. In H. Kato (Ed). *Perspectives on the Post-2015 Development Agenda*. Tokyo: JICA Research Institute.
- Schultz, T. (1962). Investment in human capital. *American Economic Review* 51(1), 1-17.
- Schultz, T. P. (1999). The formation of human capital and the economic development of African: Returns to health and schooling investments. *African Development Bank Economic Research Paper*, 37.
- Schultz, T.W (2003). Human capital, schooling and health. *Economics and Human Biology* 1, 207-221.
- Schultz, T.W. (1961). Investment in human capital. *American Economic Review*, 51, 117.
- Schultz, T.W., & Tansel, (1997). Wage and labour supply effects of illness in Côte d'Ivoire and Ghana. *Journal of Development Economics*, 53 (2), 251-286.
- Schultz, T.W. (1993). The economic importance of human capital in modernization. *Education Economics*, 1(1), 13-19.
- Sen, A. (1979). Equality of what? Tanner lecture on human values delivered on May 22 at Stanford University. Retrieved from http://tannerlectures.utah.edu/_documents/a-to-z/s/sen80.pdf.
- Sen, A. (1999). *Development as Freedom*. New York: Anchor Books Press.
- Shobande, O. A., Odeleye, A.T; & Olunkwa, N.C. (2014). Human capital investment and economic development: The Nigerian experience. *World Journal of Social Science*, 1(2): 107-115
- Shuaibu, M., & Oladayo, P. T. (2016). Determinants of human capital development in Africa: A panel data analysis. *Oeconomia Copernicana*, 7(4), 523-549. DOI: <http://dx.doi.org/10.12775/OeC.2016.030>
- Standstorm, S. (1994). Poverty reduction: Learning the lessons of experience. *IMF/World Bank Finance and Development*, 31(30).
- Stock, J. H., & Watson, M. (1993). A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica*, 61, 783-820.
- United Nations Development Programme (UNDP) (2000). Human right and human development. *Human Development Report*. New York: Oxford University Press.
- Wolff, E. N. (2000). Human capital investment and economic growth: exploring the cross-country evidence. *Structural Change and Economic Dynamics*, 11(433-472).
- World Economic Forum (2013). *The Human Capital Report*