

tomatoes and wheat. Bio data of all farmers and the surface area of their farms are taken to facilitate easy access to agricultural support programmes. The bio data will be linked to Bank Verification Number (BVN) data so that genuine farmers alone benefit from the programmes.

Rice farmers Association of Nigeria (RIFAN) cited constraints to rice production to include unavailability of machines like tractors and quality seed. Rice companies come to buy the paddies directly from the farm to process and package. Lake Rice is cultivated in Kebbi, milled and bagged in Imota, Lagos. Lake Rice provided good alternative to imported expired rice. The Lagos-Kebbi food production and supply template could be a model for other states to emulate and improve the economic well-being of their citizens. This indicates we shall soon come out of recession and also diversify our economy through agriculture (Abu, 2017).

West African Cotton's (WACOT's) N10 billion rice mill located in Argungu has a production capacity of 100,000 tons annually. Silos for storing 18,000 tons of paddy and a warehouse for storing additional 12,000 tons of paddy are available. When operational, it is expected to generate direct and indirect employment for 3,500 people and its procurement will reach out to 50,000 farmers. The rice mill will be completed within 16 months and when completed, it would be bigger than any rice mill in the country. Last year, a target of one million metric tons of rice was achieved in Kebbi State. Nigeria consumes an average of five million tons of rice per year. WACOT has the capacity to produce world class rice that could be compared with those produced in Thailand and India.

At secondary production level, agro industries with some investment potential include cassava processing (imagine *Gari* imported from India!), vegetable oil processing, fruit processing and flour milling. Composite flour can be produced from a suitable combination of different commodities. Tanning is specific to the north while rubber processing is common to the southeast and south-south (Manyong *et al.*, 2005).

Value chain approach focuses on enterprise commodity value chains for the development of crops, livestock and fisheries thereby creating much more wealth in agricultural production. Federal Government has prioritized rice, wheat, maize, soya beans, and tomatoes for 2016-2018 for domestic consumption. For export crops, the initial focus will be on cocoa, cassava, oil palm, sesame, and gum Arabic. From 2018 onwards, the export focuses add bananas, avocado, mango, fish, and cashew nuts (Anonymous, 2016). Other agriculture related exports include *tafasa* seed, roselle calyx (*zobo*), *etc.*

4.0. Conclusion

For the country to come out of its current economic doldrums, there must be a total shift from oil money, which has contributed to total neglect of agriculture. We have seen the effect of rent economy that the country has been running for the past half a century. With

the frittering away of the nation's resources by the immediate past government and the drastic reduction of crude oil price at the international market, the country's economy just went into recession. To come out of this economic logjam, we need to embark on massive agricultural practice. Agriculture used to be our economic mainstay during and shortly after independence. The discovery of oil in commercial quantity shifted our attention from agriculture to petrodollars. That abandonment of agriculture and the pursuit of oil money and profligacy of certain regimes in the political evolution of the country brought us to the present state of economy hardship. The cumulative effects of abandonment of agriculture and the culture of waste are what we are witnessing today. To get out of this economic hardship, we must retrace our steps back to agriculture

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HUMAN CAPITAL DEVELOPMENT: A KEY TO SUSTAINABLE DEVELOPMENT IN NIGERIA

Olayide O. Olaoye¹²

ABSTRACT

This study evaluated the impact of human capital development on the Nigerian economy from 1981-2017, based on the endogenous growth theory. The independent variables of the study include public expenditure on health, primary, secondary and tertiary school enrolments, life expectancy rate, gross capital formation and real GDP which were obtained from Central Bank of Nigeria Statistical Bulletin (2018) and World Bank World Development Indicators (2018). The estimation techniques used include correlation, Granger causality test, Johansen co-integration technique and the error correction mechanism. Findings of the study showed that current year life expectancy ratio, last year stock of capital and last year secondary school enrolment had positive influence on GDP. Also, public expenditure on health for both current year and one year lagged value, a year lagged value of primary school enrolment and a year lagged value of tertiary school enrolment negatively impacted on the Nigerian economy. The implication of this result is that for the desired improvement in the Nigerian economy to materialize, there is the need for policy makers to consider increasing expenditure on education, particularly primary and tertiary levels of education. Also, more funds should be allocated to the health sector in order to provide the necessary facilities that will enhance the contribution of the sector to the well-being of citizens and indirectly to economic growth.

Keywords: Endogenous Growth Theory, Human Capital Development, Sustainable Development

1.0 Introduction

The important role of human capital in national development provides the rationale for aids and assistance from developed countries and international organisations, enjoyed by developing countries and Nigeria in particular. The development of the human capital (citizens) of a country is key to national development (Mba, Mba, Ogbuabor & Ikpegbu, 2013). Human capital development has been defined as any input in equipping people with the capacity to improve their personal quality of life, that of their family, their organisation, the community to which they belong and the society at large (Okwoli, 2014). Therefore, human capital development involves the improvement of human capacities in order to

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attain inclusive and sustainable national development, as well as enhance the well-being of individuals. The development of human resources surpasses the limited common perspective of educational attainment, skill acquisition and good health. Apart from enhancing individual capacity, the benefit of human capital development extends to enhancing the institutional capacity of a country, through government policies, programmes and development plans (Okwoli 2014). Hence, the adoption of the United Nations' Sustainable Development Goals (SDGs) by all economies. Goals 3 and 4 of the SDGs provide a fulcrum for this study.

Health is an invaluable factor in the productivity of human resources and a key factor influencing both microeconomic and macroeconomic performance of countries. Goal 3 of the SDGs aims at maintaining good health and ensuring the well-being of citizens. Education, on the other hand is essential in building capacity in order to move developing countries to join the league of advanced countries. Education, both formal and informal, is necessary to inculcate moral values in citizens, equip people with profitable skills, prevent avoidable spending on amnesty programmes, as well as get the citizens of a country on the same pedestrian for progress. Goal 4 of the SDGs promotes the achievement of quality education for all citizens. In developing economies, health indicators reveal that life expectancy at birth increased slightly from about 55 years in 1998 to 60 years in 2008 and further to 65 years in 2017 (WDI, 2018). Infant mortality rate reduced drastically from 92 deaths out of every 1,000 live births in 1998 to 64 deaths in 2008 and 47 deaths in 2017 (WDI, 2018). Also, educational status in developing countries showed that out of gross enrollment in 2017, few people enrolled in the tertiary level of education (10%) compared to primary (102%) and secondary (45%) levels (WDI, 2018). In the same vein, standard of living as measured by the GNI per capita shows an increasing trend from approximately \$534 in 1998 to \$733 in 2008 and \$914 in 2017 (WDI, 2018).

In Nigeria, there has not been substantial increment in life expectancy. Life expectancy in 1998 stood at approximately 46 years, in 2008 the value increased to 50 years and 54 years in 2017 (WDI, 2018). This means that Nigerians are expected to die before reaching retirement age of 60 years in the civil service. Also, the share of tertiary enrollment in 2017 was only 10%, while primary and secondary enrollments were 84% and 50% respectively (WDI, 2018). This statistics shows that Nigerian government has concentrated more on basic education (that is, primary education plus junior secondary education), while neglecting other levels of education. Despite government effort at improving healthcare through the initiatives of National Health Insurance Scheme (NHIS) and Public-Private Partnership (PPP), healthcare delivery in Nigeria has not improved. Similarly, education initiatives like the feeding of primary school children has been selective and has failed to cover other important needs of the pupils like clothing transportation and health. Even the condition of the learning environment has not improved. In addition, government programmes such as the Universal Basic Education (UBE) scheme and educational strategies embedded in the National Economic Empowerment and Development Strategy

(NEEDS), Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs) have failed to adequately cater for indigent children at the secondary and tertiary levels of education.

The challenge remains that government expenditure on health reveals policy focus on temporary healthcare as opposed to permanent eradication of ill-health among citizens. Also, in the education sector, since much of government focus has been on basic education, only the children of the rich are privileged to enrol at higher levels of education and particularly, the tertiary level. Moreover, few of the children from poor families, who struggle to enrol and graduate from tertiary educational institutions find it very difficult to get paid job due to massive unemployment that has bedeviled the Nigerian economy. Thus, amounting to waste of human resources, which should have contributed to national output and development. If this situation persists, criminal tendencies which have engulfed the nation and crippled economic activities in some areas in the country, is likely to increase.

Previous authors have examined the relevance of human capital in economic growth and development, and concluded that due to insufficient funding and policy somersault, the desired results have not been achieved. Nurudeen and Usman (2010) are of the opinion that investment in education negatively impacts economic growth, while investment in health positively impacts economic growth. Authors have also disagreed on whether the development of human capital engenders economic growth or otherwise. Many authors support the fact that improvement in human capital promotes economic growth (Innocent, *et al.* 2017, Oladeji, 2015), while others disagree with the fact that human capital contributes positively to economic growth (Iriabije & Opusunju, 2016). On the direction of association between investment in human capital and economic growth, Ditimi and Nwosa (2011) found no causal relationship. Hence, this study sets out to examine the direction of association as well as the contribution of human capital to economic growth in Nigeria or vice-versa.

The study starts from 1981, which covers the period of free education and other policy initiatives in Nigeria and stops in 2017 due to the availability of data. After this introductory section, Section Two will handle the review of literature on human capital and economic growth. Section Three will present the methodology of the study, while Section Four will discuss the findings of the study. Section Five will conclude the study and present policy recommendations.

2.0 Review of Empirical Literature

Lawanson (2009) defined human capital as the abilities possessed by an individual which contributes to the acquisition of a better living condition of both the individual and users of the human resource (or abilities). Human capital development starts from when a child is born, grows and continues until the death of that individual. Yesufu (2000) views human capital development as every effort made by a country to continuously adapt her citizens to

meet new challenges in the environment. Hence, the relevance of human resource to economic development cannot be overemphasized as it entails all activities towards training, continuously upgrading and preparing citizens of a country for the challenges in the immediate society and the world at large.

Saad and Kalakech (2009) used cointegration technique in studying the economy of Lebanon and concluded that public expenditure on education has negative effect on economic growth in the short-run but, in the long-run contributes positively to economic growth. Also, Dauda (2010) using Johansen cointegration and error correction techniques concluded that a positive long-run relationship exists between investment in education and economic growth in Nigeria. This result agrees with that of Saad and Kalakech (2009). In another study on the Nigerian economy, Nurudeen and Usman (2010) using cointegration and error correction mechanism found that public expenditure on health positively impacts on economic growth, while public expenditure on education negatively influences economic growth. This finding corroborates the short-run result of Saad and Kalakech (2009) but is at variance with the long-run result of the same author. Ndulu (2014) further noted that not only does human capital impact negatively on economic growth, the country has been losing significant proportion of her professionals and skilled human resources to advanced countries. Furthermore, Nigeria has been depending on expatriates from abroad for crucial national functions. The study also asserted to the weak state of healthcare in Nigeria

Furthermore, Fadiya (2010) using the error correction mechanism to ascertain the determinants of educational outcomes in Nigeria found income, life expectancy, primary and secondary enrolment as significant determinants of educational outcomes in Nigeria. Therefore, it was recommended that there should be increase in public spending on education, health and nutrition. Also, Bakare and Sanmi (2011) using Ordinary Least Square (OLS) method noted a positive influence of public healthcare expenditure on economic growth. Also, the study of Oladeji (2015) using OLS technique corroborates the earlier findings that human capital development stimulates economic growth. However, Iriabije and Opusunju (2016), using OLS came up with a contrary view of an insignificant relationship between human capital development and economic growth.

Finally, Innocent, *et al.* (2017) on investigating the effect of public expenditure on human capital development in Nigeria, using Autoregressive Distribution Lag (ARDL) concluded that public spending should be directed to human capital development through specialized high technologies in schools coupled with an efficient and effective health sector. However, with the current state of affairs in the health and education sectors of the Nigerian economy, the country remains underdeveloped and it is unlikely that Goals 3 and 4 of the SDGs will be achieved by the end of the stipulated period if appropriate steps are not taken.

3.0 Methodology

The endogenous growth theory will be adopted as basis for this study. The endogenous growth theory which was first developed by Romer (1990) and later extended by Lucas and Barro (1996) opines that economic growth is determined by internal forces in an economy. Harnessing these internal forces, which include the human resources of the country with the inherent technological knowledge will lead to growth in the economy. The resultant economic growth will be generated through new forms of technology as well as more efficient and effective means of production. This growth according to the theorists will be created and sustained internally and not through external relations. Hence, for any meaningful growth and sustainable development, a country should focus on her domestic resources, particularly human capital. Therefore, endogenous growth is only possible through long-run economic growth and technological progress. This growth is brought about through research and development, education, intellectual property and trade policies in favour of the domestic economy.

The endogenous growth theory is relevant to this study in that the use of advanced technologies in the development of human capital, and thorough research and development can only be achieved through massive public expenditure on education and health. Hence, Romer (1990) opined that economic growth informed by technological advancement results from investment decisions by economic units within a country. According to Romer, investment in human capital results in increasing rate of returns.

Following the model specification of Romer (1990),

$$Y_t = K_t^\alpha [A_t L_t]^\beta \dots\dots\dots 3.1$$

where Y represents gross domestic product (GDP), K represents capital, A stands for knowledge embodied in labour, L represents labour, α is the elasticity of GDP with respect to capital, β is the elasticity of GDP with respect to labour and t stands for time.

Thus, the economic model can be expressed as:

$$Y = f(K, L) \dots\dots\dots 3.2$$

The model shows a functional relationship between output and its determinants; capital and labour. However, from the theoretical framework and the review of empirical literature, GDP is influenced by several factors besides capital and labour. Hence the model can be modified and specified as follows:

$$RGDP = f(PEH, PSE, SSE, TSE, LER, GCF) \dots\dots\dots 3.3$$

where RGDP stands for real GDP, PEH stands for public expenditure on health, PSE represents primary school enrolment, SSE represents secondary school enrolment, TSE represents tertiary school enrolment, LER stands for life expectancy rate and GCF stands

for gross capital formation; a proxy for the stock of physical capital. The model is further specified in the econometric form as:

$$\ln RGDP = \alpha_0 + \alpha_1 \ln PEH + \alpha_2 \ln PSE + \alpha_3 \ln SSE + \alpha_4 \ln TSE + \alpha_5 \ln LER + \alpha_6 \ln GCF + \mu \dots 3.4$$

Where α_0 is the intercept, $\alpha_1 - \alpha_6$ are the elasticities of RGDP with respect to the explanatory variables and μ is the stochastic variables, which captures all other factors that were not included in the model. Data for the study was sourced from the Statistical Bulletin of the Central Bank of Nigeria (CBN, 2018) and World Bank World Development Indicators (WDI, 2018). Due to non-availability of disaggregated data on public expenditure on education at the primary, secondary and tertiary levels of education, data on school enrollment served as proxy. Public expenditure on health and life expectancy rate served as for proxy health condition. It is expected a priori that a positive relationship should exist between RGDP and public expenditure on health, primary school enrolment, secondary school enrolment and tertiary school enrolment, gross capital formation as well as the life expectancy rate. The reason for this is that increase in these variables will enhance economic activities and ultimately boost RGDP. Also, existing authors support positive association among these variables (Innocent, *et al.* 2017, Oladeji, 2015).

The estimation started with examining the characteristics of the variables in order to determine the nature and magnitude of association between the dependent and independent variables using correlation analysis. The result of the correlation analysis is presented in Table 3.1.

Table 3.1: Result of Correlation Analysis

VARIABLES	RGDP	SSE	PEH	PSE	LER	GCF	TSE
RGDP	1.000000						
SSE	0.902225	1.000000					
PEH	0.977370	0.933488	1.000000				
PSE	0.303109	0.219666	-0.308750	1.000000			
LER	0.955041	0.946517	0.982559	-0.207949	1.000000		
GCF	0.101519	0.178633	0.205735	0.035189	0.305165	1.000000	
TSE	0.943546	0.860159	0.888922	-0.258397	0.878263	-0.036234	1.000000

Source: Author's Computation, 2019 (data from CBN Statistical Bulletin, 2018 & WDI, 2018)

Table 3.1 shows that primary school enrolment (PSE), secondary school enrolment (SSE), tertiary school enrolment (TSE), public expenditure on health (PEH), life expectancy rate

(LER) and gross capital formation (GCF) maintained positive relationships with the dependent variable, real gross domestic product (RGDP). The correlation result shows that SSE (0.90), PEH (0.98), LER (0.96) and TSE (0.94) were positively and strongly associated with the real gross domestic product, while gross capital formation (0.1) and primary school enrolment (0.3) had weak relationships with RGDP. The study then proceeded to test for unit roots in order to determine the level of stationarity of the variables. This is necessary because literature have it that macroeconomic variables are usually non-stationary at level. So, the Augmented Dickey Fuller (ADF) test was used to test for the level of stationarity. The result of unit root test is presented in Table 3.2.

Table 3.2: Result of Unit Root Test

Variables	Level		1st difference		Order of Integration
	ADF	5% C.V	ADF	5% C.V	
LnRGDP	0.32	2.95	3.72	2.95	1(1)
LnPSE	2.04	2.95	5.19	2.95	1(1)
LnSSE	1.10	2.95	5.67	2.95	1(1)
LnTSE	1.29	2.95	6.77	2.95	1(1)
LnPEH	0.47	2.95	6.24	2.95	1(1)
LnLER	2.84	2.95	3.22	2.95	1(1)
LnGCF	2.89	2.95	6.99	2.95	1(1)

Source: Author's Computation, 2019 (data from CBN Statistical Bulletin, 2018 & WDI, 2018)

The result in Table 3.2 shows that PSE, SSE, TSE, PEH, LER, GCF and RGDP are stationary at first difference based on the Augmented Dickey Fuller tests. Thus, the null hypothesis of non-stationarity was rejected and the alternative hypothesis accepted; connoting the stationarity of all variables at first difference, that is, all variables are integrated of order one $[I(1)]$. Hence, the study proceeded to analyse the first objective of the study, which is to test for the directional link between human capital development and economic growth. The result is presented in Table 3.3.

Table 3.3: Result of Granger Casuality Test

Null Hypothesis	Observation	F-statistic	Probability
lnRGDP does not granger cause lnSSE	35	3.65344	0.0385
lnTSE does not granger cause lnRGDP	35	2.74302	0.0811
lnRGDP does not granger cause lnPEH	35	6.34798	0.0052
lnRGDP does not granger cause lnLER	35	5.79137	0.0077
lnGCF does not granger cause lnRGDP	35	2.92370	0.0697

Source: Author's Computation, 2019 (data from CBN Statistical Bulletin, 2018 & WDI, 2018)

From Table 3.3, there exists a unidirectional casuality between real GDP and SSE. The result was statistically significant at 5% so, we rejected the null hypothesis and accepted the alternative hypothesis that lnRGDP granger-causes lnSSE. Hence, lnRGDP granger-causes lnSSE and not the other way round. Due to the significance of the null hypothesis that lnTSE does not granger-cause lnRGDP at 10%, we rejected the null hypothesis and accepted the alternative one.

Therefore, the result shows a unidirectional relationship flowing from lnTSE to lnRGDP. Furthermore, the result of the Granger causality test showed that lnRGDP granger-causes lnPEH and not the other way round as the test was significant at 1% so, we rejected the null hypothesis and accepted the alternative hypothesis. In the same vein, lnRGDP granger causes lnLER and not the other way round as the test was significant at 1% so, we rejected the null hypothesis and accepted the alternative one. Finally, the result showed the evidence of one-way movement from lnGCF to lnRGDP as the null hypothesis was significant at 10%. Therefore, we rejected the null hypothesis and accepted the alternative, which states that lnGCF granger-causes lnRGDP. Next, the study tested for the existence of long-run relationship among the variables using Johansen cointegration test. The result is presented in Table 3.4.

Table 3.4: Result of Johansen Cointegration Test

No of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Probability
None *	0.907113	214.3076	125.6154	0.0000
At most 1 *	0.768044	133.5111	95.75366	0.0000
At most 2 *	0.578543	83.83014	69.81889	0.0025
At most 3 *	0.484561	54.45284	47.85613	0.0106
At most 4 *	0.458601	31.91983	29.79707	0.0281
At most 5	0.263188	11.05747	15.49471	0.2080
At most 6	0.019602	0.673082	3.841466	0.4120

Source: Author's Computation, 2019 (data from CBN Statistical Bulletin, 2018 & WDI, 2018)

Engle and Granger (1989) posited that the existence of at least one co-integrating equation shows that long-run relationship exists among the specified variables. From the result in Table 3.4, the trace statistics indicate the presence of five co-integrating equations at 0.05 level. Hence, the null hypothesis of no cointegration was rejected. Therefore we accepted the alternative hypothesis, which states that there exists long-run relationship among the variables. Therefore, the study proceeded to analyse the second objective of the study, which is to examine the effect of the independent variables on the dependent variable using the error correction mechanism (ECM). The result is presented in Table 3.5.

Table 3.5: Result of the Parsimonious Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	-962.6183	424.7231	-2.266461	0.0376
lnRGDP(-1)	163.7946	72.46074	2.260460	0.0381
LnPEH	-0.758246	0.427124	-1.775238	0.0949
lnPEH(-1)	-152.5755	67.56401	-2.258236	0.0383
lnPEH(-2)	0.632537	0.398435	1.587551	0.1320
LnLER	12.78345	4.892713	2.612753	0.0188
LnSSE	0.052800	0.126295	0.418069	0.6815
lnSSE(-1)	50.47973	22.38583	2.254986	0.0385
lnSSE(-2)	0.002610	0.100917	0.025864	0.9797
lnGCF(-2)	0.033583	0.039994	0.839707	0.4134
lnGCF(-1)	5.762560	2.602474	2.214262	0.0417
lnPSE	-0.005262	0.151535	-0.034723	0.9727
lnPSE(-1)	-8.508717	3.681362	-2.311296	0.0345
lnPSE(-2)	0.104792	0.185346	0.565386	0.5797
lnTSE	0.125452	0.083080	1.510010	0.1505
lnTSE(-1)	-60.86589	27.05816	-2.249447	0.0389
lnTSE(-2)	0.065503	0.058281	1.123902	0.2776
ecm(-1)	-163.1241	72.53151	-2.249011	0.0389

Source: Author's Computation, 2019 (data from CBN Statistical Bulletin, 2018 & WDI, 2018)

From Table 3.5, the coefficient of determination (R^2) was approximately 0.998069, which showed that the model has a good fit. This implies that approximately 99% of the variations in the dependent variable (RGDP) is explained by the explanatory variables included in the model. F-statistic is statistically significant at 1%, showing that the result of the ECM is

highly significant. Also, the ECM coefficient shows the speed of adjustment of RGDP to changes in the explanatory variables. The coefficient of the constant is negative and statistically significant at 5%. This implies that a unit increase in the intercept will result in approximately 963 units decrease in RGDP in the long-run. Last year RGDP was statistically significant at 5%. The result shows that a unit increase in last year RGDP will lead to approximately 164 units increase in RGDP. The result further revealed that current year PEH and last year PEH (-1) are statistically significant in influencing RGDP at 10% and 5%, and have negative coefficients of 0.75 and 152.6 respectively. However, public health expenditure of two years ago was statistically insignificant in explaining the variations in national output. This implies that an increase in the public health expenditure in the current and previous year will bring about negative effect on real gross domestic product. Hence, a unit increase in public health expenditure in the current and last year will lead to decrease in RGDP by approximately 1 unit and 153 units respectively. Thus, this result suggests that public health expenditure in Nigeria has negative impact on economic growth.

Life Expectancy Ratio (LER) has a robust positive coefficient of 12.8 and is statistically significant in explaining the variations in RGDP at the 5% level of significance. This implies that the variation in life expectancy has a serious effect on real gross domestic product. In other words, it shows that a unit increase in life expectancy rate will lead to increase in RGDP by 12.8 units. The variation shown by secondary school enrolment of the previous year has positive co-efficient of 50.5 and is statistically significant at 5% which implies that a unit increase in one year lagged value of SSE will increase real gross domestic product by approximately 51 units. Gross Capital Formation of the previous year showed a positive association with RGDP and is statistically significant at 5%. This implies that Gross Capital Formation would have a positive impact on the real gross domestic product. A unit increase in the stock of physical capital will lead to approximately 6 units increase in RGDP. Tertiary school enrolment of the previous year was negatively associated with GDP and statistically significant at 5%. Therefore, a unit increase in tertiary school enrolment last year will result in approximately 61 units decrease in RGDP in the long-run.

4.0 Discussion of Findings

The result of correlation analysis showed that the explanatory variables were strongly associated with RGDP except for primary school enrolment and gross capital formation which were weakly associated to RGDP. Considering the time series using Augmented-Dickey Fuller test for unit root, the t-statistic values were greater than the critical values at 5% level of significance. Unit root test showed that RGDP, PSE, SSE, TSE, PEH, LER and GCF were non-stationary at levels. However, all the variables were stationary at first difference in the ADF test. This implies that the time series were integrated of order one.

The result from the causality test showed that there exists a unidirectional causality between real RGDP and the explanatory variables (PSE, SSE, TSE, PEH, LER and GCF) so, we reject the null hypotheses and accept the alternative hypotheses. This finding contradicts the result of Ditimi and Nwosa (2011) who found no causality between RGDP and human capital. Furthermore, the result of the cointegration test provides evidence of a long-run relationship between RGDP and the explanatory variables (PSE, SSE, TSE, PEH, LER and GCF). This suggests the possibility of interactions between the dependent and explanatory variables in the long-run. With the identification of cointegrating equations among the variables employed for estimation, error correction technique was employed for predicting the dynamic behaviour of RGDP in response to PSE, SSE, TSE, PEH, LER and GCF. The ECM result showed that increase in the RGDP of the previous year will positively impact on current year RGDP. The values of the coefficients of life expectancy ratio and a year lag of secondary school enrolment were in accordance with the a priori expectation. Accordingly, it was inferred that life expectancy ratio and a year lag of secondary school enrolment have a direct or positive relationship with economic growth in Nigeria. This finding is in line with Innocent, *et al.* (2017) as well as Oladeji (2015).

Furthermore, the result showed that public expenditure on health, a year lagged value of public expenditure on health, a year lagged value of primary school enrolment and a year lagged value of tertiary school enrolment had negative relationships with economic growth in Nigeria. This result also corroborates the findings of Iriabije and Opusunju (2016) although it contradicts a priori expectation that public expenditure on health, primary school enrolment and tertiary school enrolment should be positively associated with RGDP. From our analysis, a positive relationship exists between real gross domestic product and life expectancy ratio, a year lagged value of secondary school enrolment and gross capital formation. This means that an increase in the life expectancy ratio, the stock of capital and a year lag of secondary school enrolment through increased production leads to increase in economic growth. Therefore, the higher LER, GCF and SSE, the higher the Real Gross Domestic Product.

5.0 Conclusion

The study examined the effect of human capital on output in Nigeria over the years 1981 to 2017. Based on the framework of endogenous growth theory and using the error correction mechanism it was found that previous year RGDP, current year life expectancy ratio, previous year stock of capital and a year lagged value of secondary school enrolment had positive impacts on the economy over the period under study. Furthermore, public expenditure on health for both current year and one year lagged value, a year lagged value of primary school enrolment and a year lagged value of tertiary school enrolment negatively impacted on the Nigerian economy. The implication of this result is that for the desired improvement in the Nigerian economy to materialize, there is the need for policy