THE IMPACT OF HUMAN CAPITAL DEVELOPMENT ON ECONOMIC GROWTH IN NIGERIA; AN EMPIRICAL ANALYSIS

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ABSTRACT

The study empirically examined the impact of human capital development in the form of government expenditures on health and education as well as the impact of population growth on economic growth of Nigeria over the period of study (1980-2017). The study employed the Augmented Dickey-Fuller (ADF) and Philips Peron (PP) techniques to test for the unit root or stationarity of the data. To test for the long run relationship between the dependent variable and other explanatory variables Johanssen Joselius cointegration technique was employed. Error Correction Method (ECM) was also applied. Other diagnostic tests such as D.W test for autocorrelation, Breusch-pegan Heteroskedasticity, Cusum and Cusum of square were also employed to check the stability and fit of the model. The empirical results revealed that; population growth has a positive and significant impact on the economic growth of Nigeria, expenditure on education has a positive but weak impact on economic growth of Nigeria. Result also revealed a negative relationship between health expenditure and economic growth. The study suggests that policies should be drafted and implemented to ensure that investment in education and health is fully and efficiently utilized in order to achieve a sustainable economic growth.

KEYWORDS: Human capital, economic growth, health, education, cointegration

1 INTRODUCTION

Education and health are basic components of human capital which are essential for any meaningful development. Health is central to well-being, and education is essential for a satisfying and rewarding life; they are fundamental to the broader notion of expanded human capabilities that lie at the heart of the meaning of development (Todaro & Smith, 2011). No country has achieved sustained economic development without substantial investment in human capital. The role and importance of human capital that propels the pace of economic growth cannot be overemphasized. The development of human capital has been recognized by economists to be a key prerequisite of a country socio-economic and political transformation. Therefore, human capital is considered as the most valuable asset of a country and needs to be mobilized, develop and empowered to participate fully in all socio-economic activities. (Adawo, 2011). Adedeji and Bamidele (2003) considered human capital as causal factors responsible for the impressive economic growth of the economy of most of developed and developing countries. Economic growth in those countries is attributable to their commitment to human capital formation. This has been largely achieved through education and training by all the people of developed and developing countries. Therefore, all developing countries

were advised to invest in human capital formation of which Nigeria also participated. Nigerian government did not only start training people in schools, but formulated educational policies as guide to primary, secondary and tertiary institutions towards making education workable in Nigeria. Nigeria has come a long way in her development planning efforts. A major component of the development planning process is the effect in human capacity building through education and training. (UNDP, 2009).

In Nigeria, the rate of illiteracy is very high and life expectancy is very low. Most of the workers are unskilled and less productive. They make use of outdated capital, equipment and methods of production. By implication, their marginal productivity is extremely low and this leads to low real income, low savings, low investment and consequently low rate of capital formation. Therefore the strategy aimed at empowering the citizenry to acquire the skills and knowledge that would prepare them for the vast challenges. Overtime become necessary, the following issues relating to human capital have remained unresolved: Uneven distribution of skilled and unskilled manpower and Misemployment of human capital in Nigeria. Most disturbing is poor reward system retarding the acquisition and development of human capital. Despite the fact that human capital has been identified as forerunner for a sustainable development and rapid economic growth, the Nigeria government has given little attention to development of education sector and provision of health care sector. Also, according to the Global Development Network and Center for the study of the Economies of Africa (2010), the Nigeria government has given less concern to spending on education which is reflective of the amount allocated to the sector as a percentage of GDP. For instance average expenditure on education as a percentage of GDP stood at 0.85% for the period 2002 to 2009 and 0.85% for 2010 to 2013 respectively (CBN, 2013). Therefore it is against this background that this study sets out to empirically investigate the impact of human capital development on the economic growth of Nigeria. Therefore this study seeks to empirically examine the impact of human capital development on economic growth and development within the context of Nigerian economy over the period under study (1980-2017). The study also examines the impact of population growth, as well as the impact of government expenditures on health and education on economic growth of Nigeria during the period of study.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Asghar (2012), using both VECM and causality based on Toda-Yamamoto causality tests are employed. The result reveals that health plays significant role in the formation of human resources; people need to be healthy or protected from sickness, and conclude that there is a positive impact of human capital to economic growth. Cooray (2009) examined the effect of the quantity and quality of education on economic growth using a number of proxy variables for the quantity and quality of education in a cross section of low and medium income countries. Study finds that education quantity as measured by enrolment at the primary, secondary and tertiary levels exert a positive and significant effect on economic growth. The effect of government expenditure on economic growth is largely indirect through its impact on improved education quality and concluded that there exists a

positive impact of human capital on economic growth of majority of the selected countries; with respect to the causality result it reveals that there is causality from capital development to economic growth. Johnson (2011) used Nigerian context to investigate the relationship between economic growth development and human capital development for the period from 1985 to 2009. The study adopts conceptual framework that employs the theoretical and ordinary least square OLS to analyze the relationship using the GDP as proxy for Economic growth; total government expenditure on education and health, and the enrolment pattern of tertiary, secondary and primary schools as proxy for human capital. To statistically and scientifically prove that human capital development has a significant impact on economic growth, a statistical analysis was embarked upon where a multiple regression model was used to evaluate the relationship between human capital development and economic growth for the periods specified above and final outcomes showed that regression performed on the model revealed that all the variables accounted for 99% variations in the gross domestic product (GDP) of Nigeria. The conclusion confirmed that there is strong positive relationship between human capital development and economic growth. Van Zyl and BongaBonga, (2009) carried out an econometric analysis on human capital development and economic growth in South African economy. The estimation was conducted with the aid of time series data from 1979 through 2006, and the conclusion made indicates that increase in human capital in South Africa does not translate into high technological change and ultimately higher economic growth. Appleton & Teal (2009) examined the effect that human capital has on the economic growth and conclude that wisdom that education has high returns in terms of economic growth and reached a conclusion that physical and human capital are complements and there is still slow growth of human capital in Africa compared to South Asia. And finally poor health combined with education could warrant such outcomes. Ranis (2004) made an examination of Human development and economic growth in the context of India, and the study noted that income growth clearly strikes one as the main contributor to directly increasing the capabilities of individuals and consequently the human development. Education and health on the other side have a strong effect on labor productivity. Boozer et.al. (2003) developed and analyzed empirical strategies to estimate the strength of connection between Human capital development and economic growth. This study is the continuation of the study that was conducted by the (Ramirez, Stewart and Ramiz, 2000) which used data from 1970 to 1992. Results revealed that there is evidence of positive relationship running from either side between human capital and economic growth although it was further stated that the relationship was not automatic in either direction. Umut, (2011) investigated the impact of human capital on economic growth in fourteen countries; the study applied the generalized method of moments (GMM) and panel analysis techniques. Therefore this study confirmed that human capital development has an impact on economic growth. The empirical analysis of the study showed different outcomes compared to the theoretical review, and the empirical analysis mixed outcomes when it comes to the existence and direction of relationship between human capital and economic growth.

Adenuga (2006) examined the relationship between economic growth and human capital development using Nigerian data from 1970 to 2003. They applied co-integration analysis

incorporating the Error Correction Mechanism and found that investment in human capital through the availability of infrastructural requirements in the education sector accelerate economic growth. This study concludes that there will be no significant economic growth in any economy if there is no human capital development. Oluwatobi and Ogunrinola (2011) examined the relationship between human capital development efforts of the Government and economic growth in Nigeria. It seeks to find out the impact of government recurrent and capital expenditures on education and health in Nigeria and their effects on economic growth.

With respect to the theoretical framework, this study was based on Neoclassical Growth Theory
This theory emphasis for growth is the importance of saving and capital formation which could be substantially mobilize through liberalization of the financial market which could help attract additional domestic and foreign investment and thus increase the rate of capital accumulation. The Solow neoclassical growth model put forward by Robert Solow in 1956 was advancement over the Horrod-Domar formulation. He attributed growth to increase in labor productivity and capital accumulation. Growths not explained by these two factors were accounted for by an exogenous shock of technology called the Solow residual. His model illustrated diminishing returns to labor and capital separately, and constant return to both factors jointly. Output growth is a function of the numbers of labor, capital accumulation and improvement in technology. The clearest exposition of his model is: Y=Ka (AL) 1-a where K and L are stock of capital and labor respectively, and (1-a) are the elasticity of output with respect to capital and labor. Perfect competition, diminishing returns and an exogenous technology were the basic assumptions guiding the model. He encouraged greater access to foreign ideas of production which according to him can help raise the rate of technological progress.

3 METHODOLOGY

This study makes employs the time series data for the period of study. Time series data is advantageous because it captures a country's specific behaviors and devoid of endogeneity, thus providing an in depth policy implication (Forbes, 2000). The data for this study covers the period between 1980 and 2017. The data on some of the variables were sourced from World development indicators, while others were from the National Bureau of Statistics Economic and Statistics Review (various issues). With respect to the statistical tool of analysis the study employed Augmented Dickey Fuller (ADF) and Philips Peron method of stationarity testing. These methods were employed in order to check the stationarity of the time series data employed in this study. The study also employed co integration test based on Johanssen josselius co integration technique in order to test for the existence of long run relationship between or among the dependent and other explanatory variables used in the study S.B. Manu et al (2018). The error correction methods ECM also used in this study. Other diagnostic tests were also carried out to check the normality as well as stability of the model.

3.1 Model specification

This study takes its root from the endogenous theory of Romer (1990). Human capital development can influence the capacity of individuals and the economy to increase the overall performance of the economy. Nevertheless we can comfortably say that human capital is a key factor at work in influencing the growth of a country's gross domestic product; there are important factors that can be used as a yardstick for measuring human capital development as cited in the literature review, therefore, it behooves on researchers to take in account the relative influence of these factors when an evaluation of the impact of human capital development on an economy's general performance.

For the purpose of this study, the variables to be used are gross domestic product, health expenditures, education expenditure and population.

Education expenditure and health expenditures have been part of the federal government of Nigerian expenditure in order to enhanced development process in the country via gross domestic product enlargement (GDP). However, evidence show that population determines the number of people that benefit from such expenditure. The following functional relationship is specified to determine the impact of human capital development on the Nigerian Economic growth.

$$GDP = f(HE, EDU, POP) \ldots\ldots\ldots\ldots\ldots\ldots..(1)$$

Where;

GDP= Gross Domestic Product

HE= Health Expenditure

EDU= Education Expenditure

POP= Population Growth

$$GDP = \beta_0 + \beta_1 EDU + \beta_2 HE + \beta_3 POP + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(2)$$

Taking the natural logarithmic of both sides of equation (1) and assuming linearity among the variables gives:

$$\ln GDP = \beta_0 + \beta_1 \ln EE + \beta_2 \ln HE + \beta_3 \ln POP + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots....(3)$$

The β's are coefficients to be estimated and their a-priori signs indicate that all the coefficients are positively related to GDP. While U is the random error, with mean zero and constant variance. Differencing the variables we have

$$\Delta \ln GDP = \beta^0 + \beta^1 \Delta \ln EE + \beta^2 \Delta \ln HE + \beta^3 \Delta \ln POP + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4)$$

4.0 FINDINGS AND DISCUSSIONS

Table 1

ADF and PP Unit Root Test results

Variables	Level		First Difference	
	ADF	PP	ADF	PP
LGDP	-2.948 (0.9994)	-2.948 (0.9987)	-2.951 (0.0004)	-2.951 (0.0004)
LEDU	-2.948 (0.9587)	-2.948 (0.8878)	-2.951 (0.0003)	-2.951 (0.0001)
LHLTH	-2.948 (0.9142)	-2.948 (0.9309)	-2.951 (0.0000)	-2.951 (0.0000)
LPOP	-2.981 (0.1649)	-2.948 (0.9970)	-2.981 (0.0189)	-2.951 (0.1797)

Note: Numbers in parentheses are P-value

The results show that the variables were found to be stationary at first difference. So the null hypothesis of the unit root can be rejected for the giving variable at value and hence one can conclude that the variables are stationary at first difference and are integrated of the same order I(1). Hence we can conveniently adopt ECM method and co integration tests such as JJ method.

Johansen Juselius Co integration test

Table 2

Johansen-Juselius (JJ) Co integration Test

Null Hypothesis	Test Statistics		Critical values	
	Trace	Max-Eigen	Trace	Max-Eigen
None[*]	177.3916	82.115	47.856	27.58434
At most 1[*]	35.27638	17.644	29.797	21.13162
At most 2[*]	17.63288	14.142	15.495	14.26460
At most 3[*]	3.490554	3.491	3.841	3.841466

From the table 2 above it can be seen that there is evidence of long run relationship between the dependent and the independent variable, this is because there is the presence of four co integrating equations in the JJ test. This indicates that there is long-run relationship between the variables not only short run relationship between the variables.

Table 3

Long run Relations

Estimate	Constant	ΔlnEDU	ΔlnHLTH	ΔlnPOP
JJ	-16.47053	-0.0298 (-1.689)	-0.092 (6.321)	2.558 (17.904)

Note numbers in bracket are t-statistics.

Table 3 above shows or presents the long run relationship between gross domestic product and the other macroeconomic variables.

Table 4

$\Delta lnGDP=-4.3811+0.04310\Delta lnEDU_{t-1}+0.0397\Delta lnHLTH_{t-2}+556.462\Delta lnPOP_{t-2}-0.7621ECT_{t-1+\mu}$		
(0.0005) (0.1158) (0.0942) (0.0001) (0.0001)		
Table 5 Diagnostic checks		
R^2= 0.778807 Adj-R^2=0.646092	DW stat= 2.376	ARCH=0.526 (0.473)
F-stat: 5.868 (0.003)	JB=0.680 (0.712)	LM=0.817 (0.457)
N=33	Heteroskadesticity; Breusch-Pagan-Godfrey=3.147 (0.011)	RESET=0.937 (0.345)

The long run estimates of the model of human capital development are shown in table 3 the results indicate that education expenditure has a positive effect on growth in Nigeria. The relationship is statistically not significant at 5%. This implies that EDU increase GDP growth in the case of Nigeria. It also implies that human capital development in terms of education impacted positively on economic growth in Nigeria.

To be specific, an increase in human capital will lead to an increase in economic growth, which is in accordance with the theoretical provisions. This finding is consistent with the findings of other researchers in Nigeria (Adelakun, 2011; Adeyemi & Ogunsola, 2016) where positive relationship was reported between education expenditure and economic growth. In the short run also education expenditure have a significant positive impact on human capital development. But the magnitude of the impact is larger in the short run than in the long run. The long run result for health expenditure shows a significant negative impact on economic growth the negative sign and significant impact of health expenditure coefficient on capital formation is very instructive. The negative effect suggests that health expenditure in real terms has reduced GDP growth rate since the latter is so low and distorted that it cannot positively and significantly impacted on human capital development. The negative relationship between health expenditure and gross domestic product that exist implies a reduction in GDP by 9.2% due to a unit increase in health expenditure. The result corroborates the findings by other studies conducted on Nigeria (Adelakun, 2011; Adeniyi Ogunsola, 2016) where negative relationship was reported between human capital and economic growth in Nigeria. In the short run there is a positive and significant relationship between health expenditure and economic growth. This suggests that human capital based on health expenditure have impact on economic growth in the short run. In the long run population has positive and significant impact on economic growth. This finding is consistent with the findings of other researchers in Nigeria (Tartiyus, Inuwa & Peter, 2015) where positive relationship was reported between population and economic growth. This is because theoretically when there is increase in the population it is expected that labor will

cheaper and many people will be employed and this will lead to economic growth. But this can only be achieved if the people are healthy and educated. In the short run also there is a positive and significant relationship between population and economic growth. The ECT coefficient of (-0.762124) substantiates the long run relationship among the variables and denotes that the speed of adjustment of variables convergence to equilibrium is 76.2%.

The coefficient of determination (R^2) = 0.778807 when it was adjusted for the degree of freedom, an adjusted coefficient of determination (R^2) of 0.646 was derived. This means that about 64.6% of the systematic mean variations of the dependent variable (GDP) is explained by the explanatory variables (EDU, HLTH and POP). This means that the estimated regression model line is a good fit, hence the regression result command a moderate predicting value. The remaining 35.4% variation of GDP that was not explained by the explanatory variables used in specifying the model is accounted for by the stochastic error term (μ). The F-statistic result (5.86) reveals that the estimated regression model passed the overall significant test (F-test) at an acceptable 5% level of significance. This is an indication that there is a linear relationship between the dependent variable (GDP) and the explanatory variables (EDU, HLTH and POP) hence none of the estimated coefficient is equal to zero. With respect to the diagnostic test results, the LM test and Durbin Watson (DW) statistics shows that there is no presence of serial correlation in the model. The Jarque Bera test shows that the data in the model has been normally distributed. The Heteroskedasticity; Breusch-Pagan-Godfrey and ARCH shows no sign of Heteroskedasticity in the model. The RESET test shows that the model has been correctly specified. The stability test for the model based on CUSUM and CUSUMSQ tests. It is suggested that for a model to be stable along the sampled period, the residuals must be within the straight lines of the critical bounds at a 5% significance level Chindo et al (2015). Figure 1 and 2, depicts the results. All the figures show that the model is reasonably stable
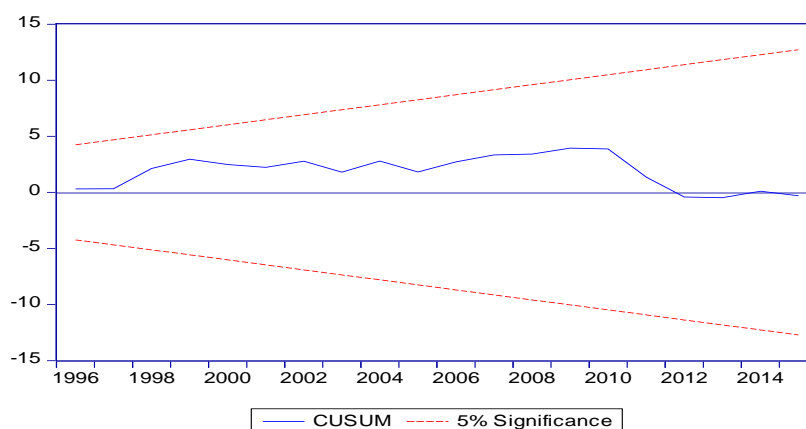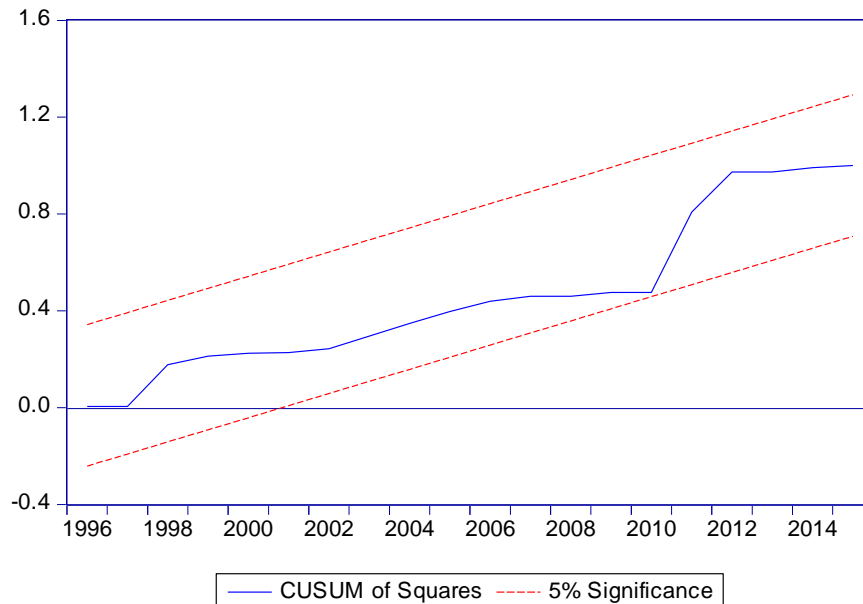
Figure 1 CUSUM

Figure 2 CUSUM of Square

5 CONCLUSIONS

The study empirically examined the impact of human capital in the form of Health expenditures, Education expenditures and population growth on the economic growth of Nigeria within the period of study. Empirical result revealed that, population growth has a positive and significant impact on the economic growth in Nigeria; however education expenditure has a positive effect on growth in Nigeria. The relationship is statistically not significant at 5%. This implies that education increase GDP growth in the case of Nigeria. It also implies that human capital development in terms of education impacted positively on economic growth in Nigeria. While empirical results show that; there exist a negative relationship between health expenditures and economic growth in Nigeria. The long run result for health expenditure shows a significant negative impact on economic growth. The negative effect suggests that health expenditure in real terms reduces GDP growth rate since the latter is so low and distorted that it cannot positively and significantly impacted on human capital development. The negative relationship between health expenditure and gross domestic product that exist implies a reduction in GDP by 9.2% due to a unit increase in health expenditure. In view of the above summary and conclusions, we can make some policy recommendations. The study suggests that policies should be drafted and implemented to ensure that investment in education and health is fully and efficiently utilized in order to achieve a sustainable economic growth.

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