Human Capital Development as a Recipe for Sustainable Growth in Nigeria

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Abstract: **The crucial role of education in the overall development of a nation cannot be overemphasized. It is not only seen as a key to poverty reduction and vehicle for promoting equity, fairness and social justice but also helps to supply the essential human capital which is a paramount condition for sustained economic growth. Thus, enhancing effective investment on education and health has been a tenet of growth and development strategies for most countries. The basic objective of this paper investigated the relationship   between human capital (through education and effective health care services) and economic growth in Nigeria, using annual time series data from 1981 to 2013. The paper employs OLS methodology with BLUE assumptions, wald test, breusch Godfrey and pairwise granger test was also used to argument the OLS methodology. The result shows that considering the magnitude 1% increase in RGDP (proxy Economic growth) is brought about by 46% increase in (EXPHLTH) expenditure on health, 107% increase in (GFCF) gross fixed capital formation, 92% increase in (TEXPEDU) total expenditure on education, 0.00091% increase in (TLBF) Total labour force. The estimated value of R^2 (goodness of fit) of 0.98 or 98% and it show that the independent variables explain about 80% of the variation in the dependent variable. The findings have a strong implication on educational and health policy in Nigeria. The study seems to suggest that a concerted effort should be made by policymakers to enhance educational and health investment in order to accelerate growth which would engender economic growth.**

*Keywords***: (GFCF) gross fixed capital formation, (EXPHLTH) expenditure on health, (TLBF) Total labour force, (TEXPEDU) total expenditure on education, OLS methodology.**

1.   INTRODUCTION

The role of education and human capital in economic growth of an economy has over the years been underscored in many studies; and there can be no meaningful economic growth without adequate human and natural resources. Education has been defined as a process by which a child or young adult develop abilities attitudes and other forms of behavior which are of positive values to the society where he lives.(Fafunwa, 1974). Education as a key component of human capital formation is recognized as being vital in increasing the productive capacity of people.

The world has entered the age of knowledge economy, education and human capital growth is crucial in most advanced economies and emerging economies that are currently experiencing profound transformations and periods of rapid growth and development (Ajetomobi, 2005).

There is increasing empirical evidence that education matters, not only for personal development health status, social inclusion and labour market prospects of individual learners, but also for the broader economic performance of countries (OECD/UIS, 2003:2006). Health and education are both components of human capital and contributors to human welfare. One index of human welfare, which incorporates income, education and health, shows that Africa's level of 'human development' is the lowest of any region in the world. (Simon and Francis, 2000)

More so, Human capital is the sum of the abilities and knowledge of individuals. It measures the quality of the labour supply and can be accumulated through education, further education and experience. Education is an investment in human

capital, while learning is the process of acquiring knowledge or skills through study, experience or teaching. Knowledge is the awareness and understanding of interconnected facts, truths or information gained in the form of experience, learning or introspection.

The economic benefits of education to improve growth rates appear to be very large. A more educated society translates into higher rates of economic growth and thus the ability of governments to alleviate poverty. Hence, the effect of education quantity on economic growth in literature seems inconclusive.

Given the current emphasis on education by the United Nations and the Millennium Development Goal (MDG) of achieving education for all, this study seeks to investigate empirically, the effect of education quantity and quality on economic growth. This is examined in Nigeria by using a number of alternative variables to proxy for education quantity. The educational challenges facing the developing economies due to resource constraints are considerable. Due to the renewed efforts made by these economies to increase enrolment ratios and allocate resources efficiently in an effort to achieve the MDG of 'education for all'. The contribution of this study is the attempt made to gain an in-depth understanding of the effects of education on economic growth; and two, to show that the effects of education on economic growth depend largely on the measure of education used.

At the micro level, human capital formation is viewed as a major determinant of economic growth. However, at macro levels, the importance of human capital formation in economic growth could be questioned amidst the myriads of potential explanatory variables.

Hence, there is a need to empirically examine the impact of human capital on economic growth in Nigeria, with a view to deriving implications for policy direction. This indeed constitutes the focus of this paper.

Nigeria has economic problems, her poverty situation is alarming though it records impressive rates of economic growth which averaged 7.6% between 2003 and 2010(World Bank 2011), but this did not lead to sustainable development (Oladoyin, 2010)

According to CIA (2010), Nigeria's real GDP growth rate was 6.51% in 2005, it declined to 5.63% in 2006, 5.0% in 2009 and rose to 6.4% in 2007, before recording another fall to 6.1% in 2008. In 2010 it stood at 8.2% (Abiola, 2012).   In Nigeria, the effect of poverty on students is that they are mostly ill equipped and lack practicable skills needed for self-employment and there exists limited jobs to absorb them in the nation. Hence, graduating students readily became additions to the nation's unemployment figure as a result of inadequate investment in Human capital in the country, Sambo, (2002).

Hence, there is a need for a clear-cut knowledge of the linkage existing between human capital development and economic growth. Accordingly, this study will fill this gap by empirically examining the relationship between Human capital development and economic growth in Nigeria. (1990-2012)

The impact of human capital development on the economy is still an unresolved issue theoretically as well as empirically. A few studies report a positive and significant relationship between human capital and economic growth while several others find significantly negative or no relation between investment in human capital and economic growth.

2.   CONCEPTUAL FRAMEWORK

The economic prosperity and functioning of a nation depend on its physical and human capital stock. Whereas the former has traditional been the focus of economic research, factors affecting the enhancement of human skills and talent are increasingly figuring in the research of social and behavioural sciences. In general terms, human capital represents the investments people make in themselves that enhance their economic productivity. Olaniyan and okemakinde (2008)

The theoretical framework most responsible for the wholesome adoption of education and development policies has come to be known as human capital theory. Based upon the work of Schultz (19710, Sakamota and powers (1995) and Psacharopoulos and Woodhall (1997), human capital theory rests on the assumption that formal education is highly instrumental and even necessary to improve the production is a productive population.

Human capital theory emphasizes how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capital which is a product of innate abilities and investment in

human being. The provision of formal education is seen as a productive in human capital, which the proponents of the theory have considered as equally or even more equally worthwhile than that of physical capital.

According to Babalola (2003), the rationality behind investment in human capital is based on 3 arguments that:

- The new generation must be given the appropiate part of the knowledge which has already been accumulated by previous generations.

- New generation should be taught how existing knowledge should be used to develop new products, to introduce new process and production methods and social services.

- People must be encouraged to develop entirely new ideas, products, process and methods through creative approaches.

According to Fagerland and Saha (1997), Human capital theory provides a basic justification for large public expenditure on education both in Developing and developed nations. The theory was consistent with the ideologies of democracy and liberal progression found in most western societies. Its appeal was based upon the presumed economic return of investment in education both at macro and micro levels. Efforts to promote investment in human capital were seen to result in rapid economic growth for society. For individuals, such investment was seen to provide returns in the form of individual economic success and achievement.

Most economists argue that it is human resources of the nation, not its capital nor its materials resources that ultimately determine the character and pace of its economic and social development. Psacharopoulos and Woodhall (1997) Assert that:

Human capital constitute the ultimate basis of wealth of Nations capital and natural resources are passive factors of production, Human beings are the active agencies who accumulate capital, exploit natural resources, build social, economic and political Organization and carry forward national development.

2.1 Literature Review:

This chapter highlights some relevant Conceptual framework, theoretical and empirical studies on Human capital and economic growth in Nigeria. The review enlightens us on the major determinant of human capital development which is education, health, life expectancy and their contribution to the aggregate economy in Nigeria. Also, it reviews the relationship that exists between the variables under consideration and provides theoretical and empirical background for the methodology adopted in chapter three.

2.2 Growth centers focus on human capital:

Many of the countries characterized by rapid growth owe their success to solid gains in human capital – especially India, China, Thailand and Spain. Bergheim (2005). On the other hand, many of the slow-growth countries also are likely to post small gains in human capital. Empirical investigation reveals that human capital is the most important factor of production in modern economies. Human capital is the sum of the abilities and knowledge of individuals. It measures the quality of the labour supply and can be accumulated through education, further education and experience.

Education is an investment in human capital, while learning is the process of acquiring knowledge or skills through study, experience or teaching. Knowledge is the awareness and understanding of interconnected facts, truths or information gained in the form of experience, learning or introspection.

2.2.1 Human capital and structural change:

The rapid structural change caused by globalization and technological change has increased the importance of human capital over the past years. Krüger and Kumar (2004). In the rich economies, this structural change increased the pressure on the suppliers of less qualified labour (i.e. people with low human capital). Physical work is substituted by machines at home and by cheaper labour input from abroad. As a reaction, rich countries can shield themselves from globalization (negative for prosperity), cut the wages of less qualified workers (rather unpopular), and accept higher unemployment (ditto; but effectively what happened in many countries in Europe) or they can raise the skill level of their workers, Krüger (2004). Many countries have already realized that human capital is increasingly important and have acted accordingly. They are better equipped to deal with the structural changes. These countries realize that education starts in

the first year of life and does not end with a university degree: modern brain science shows that most of the synapses in human brains form within the first three years. And research on ageing shows that, although people live longer, they may suffer from age-related disabilities for shorter periods, Doblhammer and Ziegler (2005). This implies that the number of years people can spend productively rises at least as quickly as life expectancy.

2.2.2 The most Important Factor of Production:

Human capital and income are closely linked. This is true both for individuals and for whole economies. Higher human capital acquired through better and longer education allows an individual to perform higher value-added tasks more efficiently and more quickly. Thus individuals can also apply newer ideas and be more innovative. In short, higher human capital leads to more output per hour worked – productivity is higher. Similar to additional physical capital (machines), additional human capital also raises the productivity of labour. This relationship is often ignored in empirical growth models and in economic policy-making. Cited by Bassanini, Andrea and Stefano Scarpetta (2001).

2.2.3 Interaction between human capital and physical capital:

Cohen, Daniel and Marcelo (2001), reported that the link between human capital and growth is necessary. Equipping unskilled workers with ever more complicated and more expensive machines does not necessarily boost output. In fact, output might rise more significantly if the additional money were spent on more human capital instead of more physical capital. However, this could lead to conflicts of interest: the additional human capital leaves the company every evening and may decide to move on to a competitor some day. Many foreign companies in China went through this unfortunate experience over the past years. Hence, the first reference for many companies might be an investment in physical capital and they might therefore prefer tax breaks for physical investment over breaks from the possibly more sensible (from an economy-wide perspective) investment in human capital. This shows the responsibility of the individual and the state for the accumulation of an economy's human capital. A lopsided focus on physical capital can be inefficient from a macroeconomic perspective, especially if globalization opens up more options in other countries for the owners of physical capital coated by Cohen, Daniel and Marcelo Soto (2001). Furthermore, there is an important interaction between trade openness and human capital in an economy: countries with higher human capital can learn more easily from abroad and therefore take greater advantage of the beneficial effects of trade opening. Marco (2005)

2.3 Education and income of individuals:

Quantitative analyses at the micro-level can explain a large part of an individual's annual or monthly income by his/her level of education and work experience. Mincer (1974). Econometric estimates consistently show a statistically significant positive impact of an individual's average years of education, even after controlling for other factors like the parent's level of income or education. Only the magnitude of the effect is somewhat controversial: estimates of the gain in income from an additional year of education range from 5% to 15%. In the USA, for example, a college graduate earns about two-thirds more than a high school graduate. In addition to the effect on income, better educated individuals are also less likely to be unemployed even though their employment need not be.

2.3.1 Education in Nigeria: A public-health issue?

The role of education in the development of a society has been vastly documented in academic journals. This section will concentrate on the need for Nigerian leaders to pay close attention to the needs of the educational sector, and treat it as a public-health issue, because the sociopolitical and economic development of a nation and (or her health) is, in many ways, determined by the quality and level of educational attainment of the population. Political leaders should take politics out of education, as the continued neglect of this sector would lead to social paralysis. The youth should be given the appropriate quality academic training and an environment that would enable them to reach their full potential.

Nigeria has innovated with some educational programs, which have only served as conduits to transfer money to the corrupt political leaders and their cronies. For instance, the nation launched the Universal Primary Education (UPE) in 1976, but as noted, the program failed due to lack of funds necessitated by corruption, among other factors. Nigeria has again launched another mass-oriented education program; this time branding it as Universal Basic Education (UBE). The President, Olusegun Obasanjo, declared during the launching of the program in Sokoto that the nation "cannot afford to fail this time around." However, not long after that, the federal government reported that the falling standard of education in Nigeria is caused by "acute shortage of qualified teachers in the primary school level." It is reported that about 23

percent of the over 400,000 teachers employed in the nation's primary schools do not possess the Teachers' Grade Two Certificate, even when the National Certificate of Education (NCE) is the minimum educational requirement one should posses to teach in the nation's primary schools (Ogbeifum and Olisa; The Vanguard Online, July 1, 2001).

2.4 Empirical Framework:

Akinyemi, Ofem, and Adebisi. (2012) examined educational financing reforms in Nigeria: a survey-based cost implications analysis for university education using the descriptive survey design and secondary data on students' enrolment and household income from the Nigerian Bureau of Statistics (NBS) and National Universities Commission (NUC) of various years. The empirical analysis revealed that tuition fees were higher in private universities than state universities due to private universities profit-oriented nature. Thus, the analysis inferred that the regressive impact of user's fee is mitigated by offering targeted scholarships with emphasis on the low and middle income households, it was suggested that National budget reform be put in place with the education sector given priority to allocation of more funds.

Ogunjimi, Ajibola, and Akah (2009) examined the sustenance of education sector reforms in Nigeria through adequate participation by all stakeholders. The empirical analysis assessed the views of stakeholders on sustenance of education sector reforms in Nigeria. Data was collected through a structured and validated questionnaire from 160 subjects randomly drawn from primary, secondary, and tertiary institutions, including education inspectorate divisions. The data collected were analyzed through the population t-test and it was revealed that community participation in administration of schools, tecahers' development and retraining improved funding by government and strenghtening of the education inspectorate services, shall significantly influence the sustenance of education reforms in Nigeria. It was therefore recommended that there should be provision for retraining of teachers at all levels of education, regular inspection/supervision of schools and provision of adequate funds to ensure sustainability.

Ekpenong, James, and Udak (2012) examined the reforming of education through user fees: ability and willingness to pay for university education in Calabar, Nigeria. Stratified random sampling technique was used and data collection was carried out using a researcher's constructed instrument called 'Household reaction to cost of schooling Questionnaire' (HRTCOSQ). To analyze the data collected for this empirical analysis, descriptive statistics and ordinary east square regression analysis were used statistically. It was detected that the desirability of the user fees as a policy option depended on the ability and willingness of the household to pay for the cost of schooling. It was therefore recommended that the user fees should be adopted by administration in different universities to raise revenue while government should provide scholarship to brilliant students from low-income households to cushion effects for equity.

Ndiyo (2002) on the "paradox of Education and economic growth in Nigeria" modeled for contribution of education growth. He considered real growth of gross product (RGDP) as respondent variable and gross fixed capital formation (GFCT), aggregate labor force (LAF) and real budget allocation to education (REDUB) as explanatory variables. He estimated the models in both level and logarithmic form respectively. In essence, education plays positive relationship between education and economic growth.

Ndiyo (2002) persist that the contribution of education to economic growth certainly depends on the quality of education.

Babatunde and Adefabi (2003) investigated the long run relationship between education and economic growth in Nigeria between 1970 and 2003 through the application of Johansen Cointegration technique and vector   auto correction methodology. Their finding reveals that the Johansen Cointegration result established a long run relationship between education and economic growth.

Lawal, Wahab and Iyiola (2011) investigated the relationship between education and economic growth in Nigeria between 1980 and 2008 through the application of ordinary least square techniques (OLS). The result shows that education investments have direct and significant impact on economic growth in Nigeria.

Deniz and Durrell (2008) traced an interaction between economic growth and education to the pioneering work of Becker (1962), Schultz (1960), Nelson and Phelps (1966). Later following neo-classical growth theory introduced by Solow (1956), several growth models were developed to explain the interaction between economic growth and education. The models developed by Roomer (1986,1990) and Lucas) (1988) on the effects of the technology on the economic growth stimulated on a new wave of discussion on the role of education on economic growth.

Otu and Adenuga (2006) examined the relationship between economic growth and human capital development using Nigerian data from 1970 to 2003. They applied the cointegration theory incorporating the error correction mechanism and found that investment in human capital through the availability of infrastructural requirement in the educational sector accelerates economic growth.

The paper then concludes that there can be no significant economic growth in any economy without adequate human capital development (Education).

Adebiyi M.A (2004) investigated the paradox of educational expenditure and economic growth relationship in Nigeria using annual time series data from 1970 to 2008. Some statistics tools were employed to explore the true relationship between these variables. The study examines statistic characteristics of each time series by testing their stationary using Augmented Dickey Fuller (ADF) Phillip Peron (PP) tests and vector Auto Regression (VAR) model. Then the relationship between growth rate of real GDP and Real capital expenditure or education is dynamically examined using error correction mechanism. The finding reveals that an increase in real expenditure on education reduces growth rate of gross domestic products which is a paradox.

Adawo M.A (2010) submitted that education (human capital) contributed to the economic model to Nigeria. The study used an econometric model to examine the contributions of primary education, secondary education and tertiary education to economic growth in Nigeria. The result of this study showed that human capital (education) of primary school form contributed to growth while in most cases that of secondary school and tertiary institution dampens growth in Nigeria.

Hrishikesh and Surendra(2007) conducted research on human capital and economic growth considering evidences from developing countries, Human capital in the form of education was used to explain GDP growth in augmented Solow models. A statistically significant coefficient for human capital variable in these models was recently reported for OECD countries using recent data. Time series and panel regressions were used for data collected on eighteen large developing countries for the period 1982-2001. This study confirms and extends results obtained by OECD and other similar studies. Since most of our models have a significant human capital regressor in such a study of developing countries, they concluded that it is important for policy regarding educational opportunities, and increased emphasis and focus on education and technology in developing countries.

Sangjoon 2004, investigated the relationship among human capital, total factor productivity growth and convergence using international panel data on macroeconomic indicators and educational attainment. It explicitly allows for the heterogeneity in technology growth across countries by use of the stochastic Solow model and dynamic panel estimation techniques. Thus the convergence in his study is toward the steady state of the individual country, not toward the common steady state for all nations in the data set as in the existing literature. It reports the findings as follows. First, heterogeneity in technology growth across countries, which has been typically assumed to be nonexistent in the growth literature, is found to be prominent. Secondly, the average estimates of convergence rates are between 27% and 32% per annum, which are much higher than those reported in the researches using cross-section data. Thirdly, the model with human capital proxy by various educational attainment measures gives higher convergence rate estimates than the model without it

2.5 Theoretical Framework:

This study bases its theoretical framework through following Loening (2002) and firstly considers human capital as an independent factor of production. Thesis presented in Cobb-Douglas production function with constant returns to scale as:

$$Y = A. K^H .H^I. L^{(1-H-I)} \dots (1)$$

Where Y is defined as output: A is the total factor productivity; K is physical capital, H is human capital and L is labour. The logarithmic conversion of equation (1) above yields the structural form of the production function as:

$$Ln\ y_t = Ln\ A + H.Lnk_t + I.Lnh_t + u_t \dots (2)$$

Where y = Y/L = output per worker

k = K/L = capital per worker

h = H/L = average human capital

In its error correction form equation (2) can be represented as:

$$MLnyt = {}_{N0} + {}_{N1}MLn\ kt + {}_{N2}.\ MLnht \ldots {}_{N3}.\ (Ln\ yt\text{-}1\ H.Ln\ kt\text{-}1 + I.Ln\ ht\text{-}1 - Ln\ A) + ut \ldots (3)$$

The final structural form of the model in the vector error correction form is given as:

$$MLnyt = Ln\ A + {}_{N1}.MLn\ kt + {}_{N2}.\ MLnht \ldots {}_{N3}.\ Ln\ yt\text{-}1 + {}_{N4}.Ln\ kt\text{-}1 + {}_{N5}.Ln\ ht\text{-}1 + {}_{N6}.Dummyt + ut \ldots (4)$$

The coefficient N3 represents the measure of the speed of adjustment through which the system moves towards its equilibrium on the average. Dummy variable is included in the model to account for the number of strikes that cause disruptions to the educational sector in the Nigerian educational sector.

In the second model, human capital is taken to affect the technology parameter directly rather than as a factor of production. The Cobb-Douglas production function with constant returns to scale is given as:

$$Y = A.\ K^{O}.L^{(1\text{-}O)} \ldots (5)$$

Expressed as a logarithmic expression after standardizing by labour units, equations (5) becomes:

$$Ln\ Y = Ln\ A + O.Ln\ K + (1\text{-}o)Ln \ldots (6)$$

The vector error-correction model combines the long-run aspect of the model and the short-run adjustment mechanism in the form:

$$MLnyt = N1.MLn\ kt + N2.\ (Ln\ yt\text{-}1 - O.Ln\ kt\text{-}1 - Ln\ A) + ut \ldots (7)$$

Total factor productivity in this model is taken to be a function of exogenous variables, such as level of human capital, government expenditure and foreign inputs. The argument is that an educated labour force performs a major role in the determination of productivity level instead of entering the production function as a factor. The expenditure on education is assumed to influence the level of human capital which is expected to cause improvements in total factor productivity. In addition, higher level of human capital speeds up the adoption of foreign technology that is expected to balance the knowledge gap between the developed and the developing countries. (Nelson and Phelps, 1966; Lee; 1995; Benhabib and Spiegel, 1994; Loening, 2002) Consequently, we take the technology parameter in the second model as a non-constant which is then allowed to be dynamic with time.

The technology parameter is presented as:

$$Ln\ A = b + {}_{N4}.Lnht + {}_{N5}.IMPGCFt + {}_{N6}.GEXEDUt + {}_{N7}.Dummyt \ldots (8)$$

Where b is the exogenous technological progress, h is the level of human capital proxy by average years of schooling; IMPGCFt is the ratio of total imports to gross capital formation and GEXEDU as government expenditure on education. We expect human capital, the measure of foreign inputs and government expenditure on education to have positive effect on total factor productivity. The dummy variable is defined as the number of general strikes, which is expected to have a negative impact on productivity performance and output growth. Substituting equation (8) into (7) gives the vector error correction model as:

$$MLnyt = b + {}_{N1}.MLn\ kt + {}_{N2}.Ln\ yt\text{-}1 + {}_{N3}.Ln\ kt\text{-}1 + {}_{N4}.Ln\ ht + {}_{N5}.IMPGCFt + {}_{N6}.GEXEDUt + {}_{N7}.Dummyt + ut \ldots (9)$$

We therefore assume that the level of human capital instead of the growth rates perform a basic role in the determination of the growth of output per worker in the second model whereby human capital affects the productivity parameter than the first model whereby the human capital enters as a production function factor.

Education plays a critical role in creating human capital, which contributes to production and economic growth just as physical capital, land, and labor do. Both micro- and macro-economists have investigated the role education plays in economic growth at the individual and economy wide levels. But the findings of each group are rarely combined. In particular, the question of allocation of educational resources across levels of education and individuals has been addressed primarily in terms of rates of return to educational investment at each level, as calculated by micro economists using individual wage and educational attainment data; the question of what role education plays in growth has been addressed by macroeconomists without attention to the many ways that educational resources are allocated in various countries. The return to investment in education, like that to physical capital, depends on the project selected; in

education, two important margins for investment decisions are the level of education and the individuals to be educated. The return to human capital in the form of schooling is a function both of the type of education and the individual's ability to benefit from the education. But, as in capital investment projects, the individual's ability to turn exposure to education into skills is not fully known before the individual enters school. As an individual proceed through school, their abilities to benefit from it become clearer. Thus, one of the benefits of basic education is to reveal suitability for further education; without basic education, an individual's potential remains unknown. This has important implications for investment; if too much money is invested in higher education without sufficient investment in lower levels of education, there will not be many students.

In conclusion, the findings from the survey of literature support the notion that Human capital matters for economic growth and development in both the developed and developing countries but there is an identified leakage which made the educational sector less productive, since more than 23% of human capital are unemployed (NBS, 2012). This has been the major problem of economic development in Nigeria.

However, additional research needs to be conducted to examine the empirical link between Human capital and sustainable growth in Nigeria.

3. METHODOLOGY

3.1 Introduction:

This chapter deals with the procedure and method used in carrying out this study. Human capital and Economic Growth in Nigeria. It entails the research design, population of the study, sample and sampling techniques, instrument for date collections, validity and reliability of the instrument and method of data analysis.

3.2 Method of Data Analysis:

The study specifically use the multiple regression (OLS) ordinary least square in the process of analyzing the data, to test the research hypothesis.

This model was employed in an attempt to determine the impact of Human capital on Economic Growth in Nigeria.

The linear multiple regression technique is given as: -

$RGDP = \alpha_0 + \alpha_1 (TEXPEDU) + \alpha_2 (GFCF) + \alpha_3 (TLBF) + \alpha_4 (EXPHLTH) + U$

Where:

RGDP = Real Gross Domestic Product

TEXPEDU = Total Expenditure on Education

GFCF = Gross Fixed Capital Formation

TLBF = Total Labour Force

EXPHLTH = Expenditure on Health

3.3 Method of Evaluation:

The evaluation consists of deciding whether the estimates of the parameters are theoretically meaningful and statistically satisfactory. For this purpose the three basic criteria ('a priori'. Statistical, econometrics) are used to evaluate the model specified.

The 'a priori' criteria: This refers to the signs and magnitude of the coefficients of the variables.

Statistical Criteria: This study makes use of statistical criteria like standard error, t-statistics, probability value and coefficient of determination. Higher standard errors imply inefficient estimates while low standard errors imply efficient estimates.

Econometrics Criteria: The econometrics criteria aimed at investigating whether or not the assumptions of the econometrics method is satisfied. The econometrics criteria make use of the F-test in testing the overall significance of model and the stability of coefficients.

4. DATA ANALYSIS AND DISCUSSION OF FINDINGS

This section deals with the presentation and analysis of the data, interpretation of results collected from different publications, and implication of the Results.

4.1 Presentation and Analysis of Results:

The result obtained from the regression analysis carried out on the equation specified in the previous chapter will be used to draw up the conclusions and possible recommendations for the study.

4.2 Empirical Analysis of Data:

The estimate of stochastic model and relevant statistics for human capital and economic growth is shown below. The co-efficient of explanatory variables are estimates of the model parameters. The estimations are based on data in the table while evaluations are based on relevant statistics.

In the study linear multiple regression [OLS] techniques were used to analyze the data which is given as follow:

$RGDP = \alpha_0 + \alpha_1 (TEXPEDU) + \alpha_2 (GFCF) + \alpha_3 (TLBF) + \alpha_4 (EXPHLTH) + U$

Where:

RGDP = Real Gross Domestic product proxy for Economic growth

TEXPEDU = Total Expenditure on Education proxy for investment in Human Capital

GFCF = Gross fixed capital formation proxy for physical capital formation

TLBF = Total Labour Force proxy for Working Human capital in the economy

EXPHLTH = Expenditure on Health proxy for investment in Human capital on health

α_0, α_1, α_2, α_3, and α_4 were parameters

μ = Error Term

Time series data were used for the analysis. E-view7 Windows econometric package was used to process the data obtained.

4.3 Descriptive Analysis:

Figure 5.2 shows the Real Gross Domestic Product Growth rate of Nigerian economy in percentage over a time frame. Observation from the figure shows that Real Gross Domestic Product Growth rate has not been stable over time in that it was negative in 1981 and 1998 respectively as show in the figure. The highest growth was experienced in 1995 with over 50% growth.
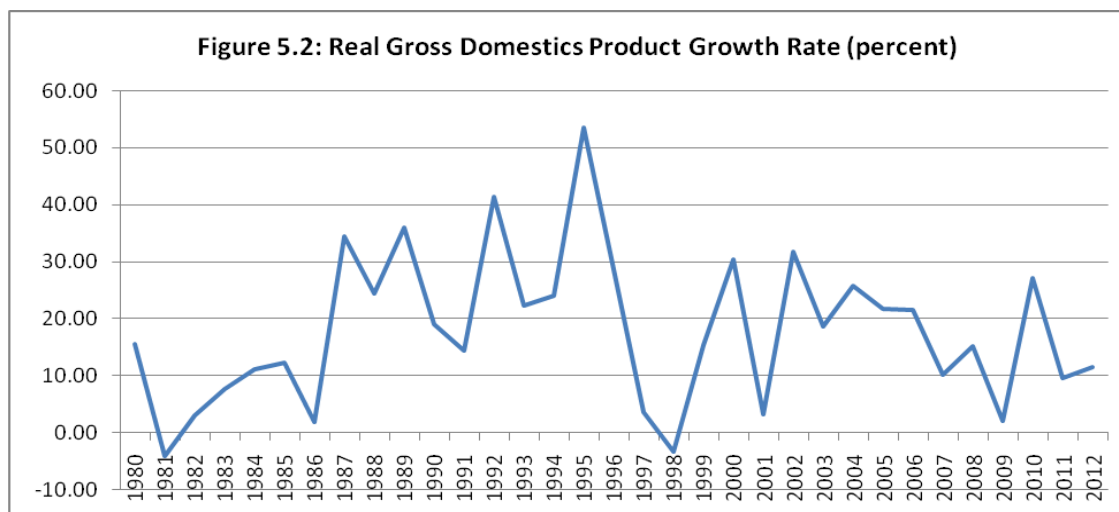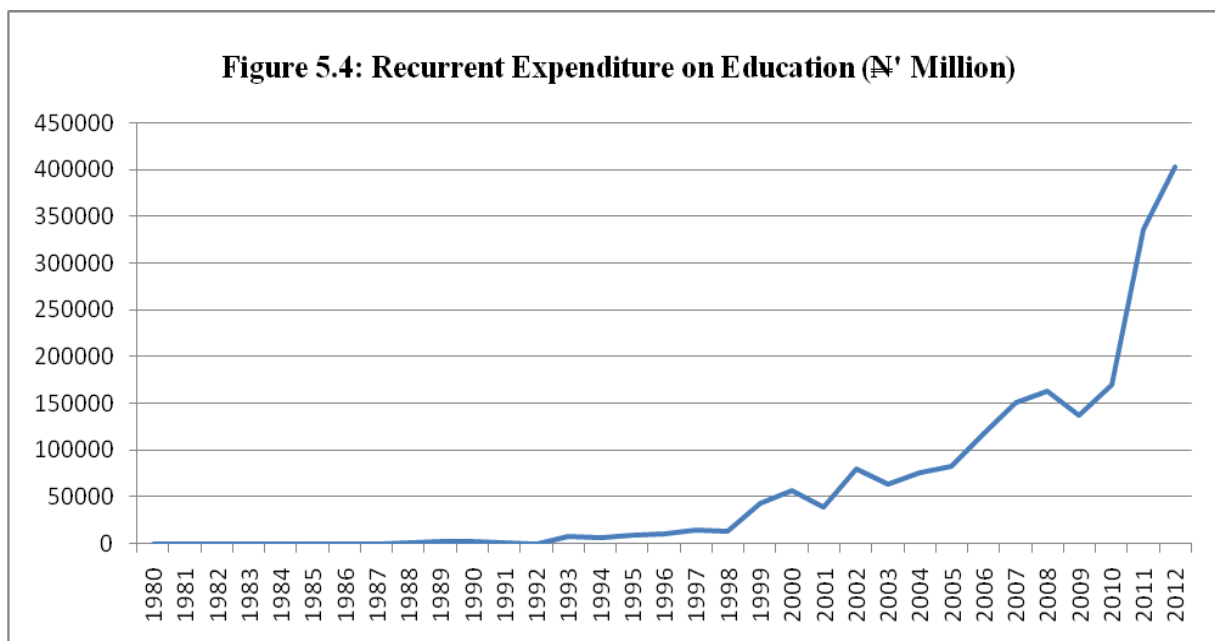

Source: Author's computation

Figure 5.3 shows the Real Gross Fixed Capital formation over the year, from the observation of the figure shows it shows that the capital formation drop from 1980 to 1982 and have seen then been fluctuating around ₦ 4billion until it drop sharply between 1998 to pick up back from 2001, but since then it has been on the increase though with some little fall.
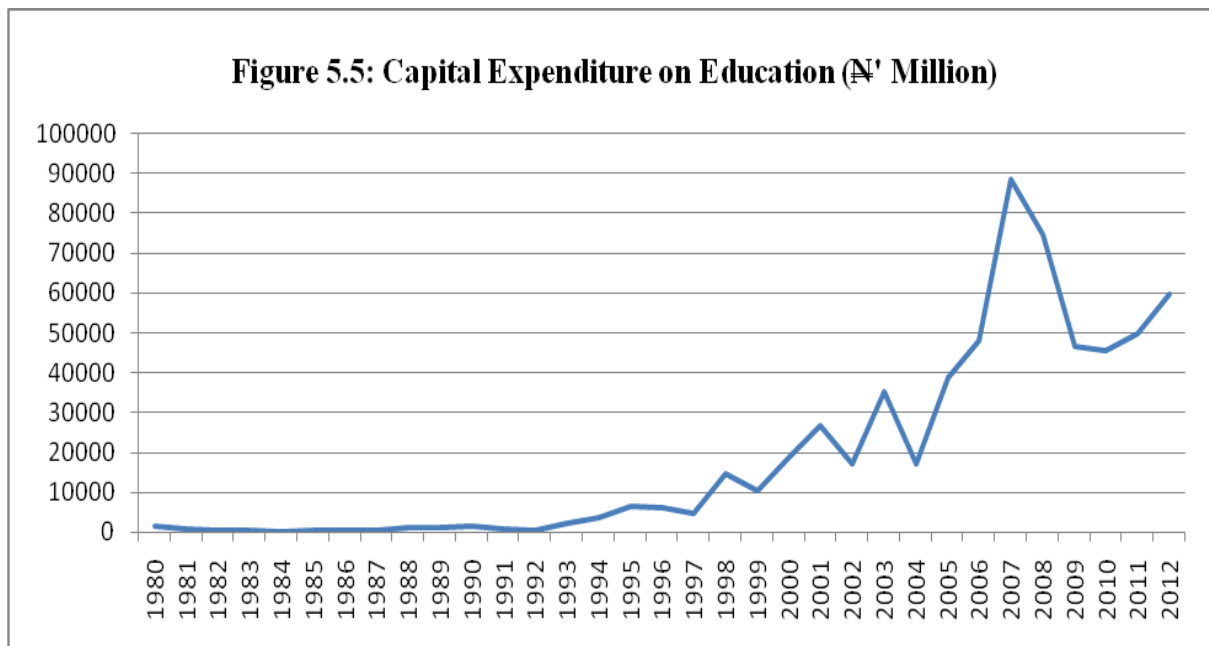

Figure 5.3: Real Gross Fixed Capital Formation (₦' Million)
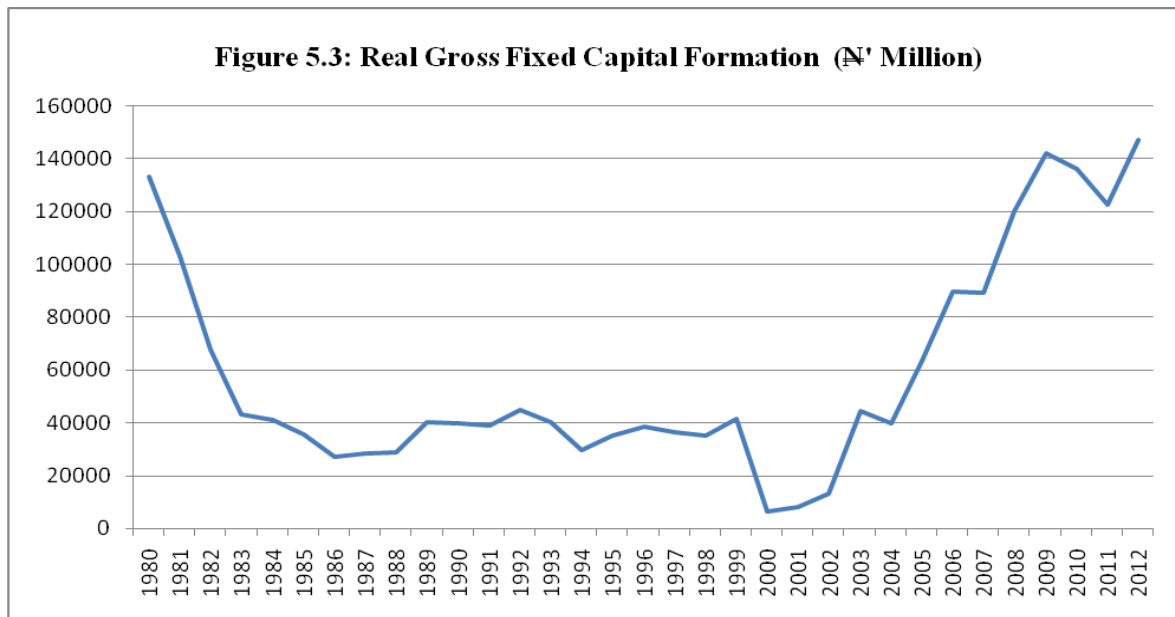
Source: Author's computation

Figure 5.4 shows the Recurrent Expenditure on Education of Nigerian economy in Millions over a time frame. Observation from the figure shows that recurrent expenditure on education was stable from 1980 to 1992and it also shows that it is less than ₦5000 Billion. However, it show consistent and increase though with sharp fall in 2009.

Figure 5.4: Recurrent Expenditure on Education (₦' Million)

Source: Author's computation

Figure 5.5 shows the Capital Expenditure on Education of Nigerian economy in Billions over a time frame. Observation from the figure shows that Capital Expenditure on Education has been increasing over time but had been less than ₦2000 Billion between 1980 and 2000. However, from 2001, Capital Expenditure on Education exceeded ₦2000 Billion and since then, it has fluctuated with marked consistence increasing between 2004 to 2008and it fell in 2009, but pick up again in 2010.

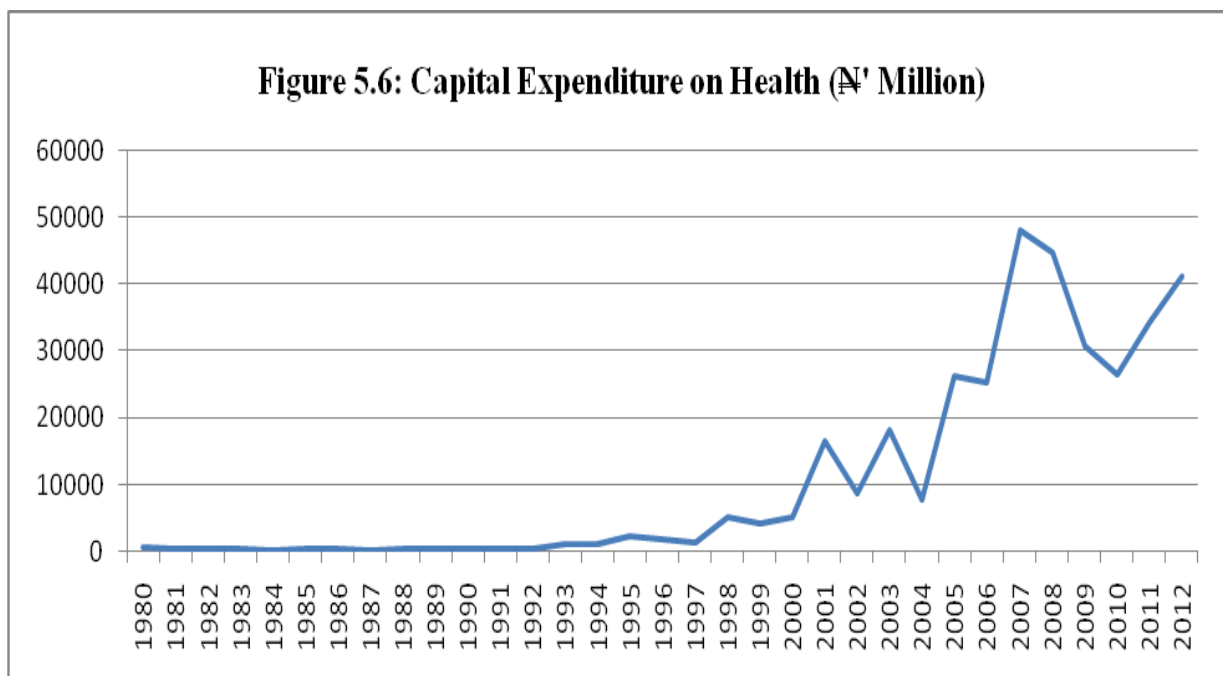Figure 5.5: Capital Expenditure on Education (N' Million)
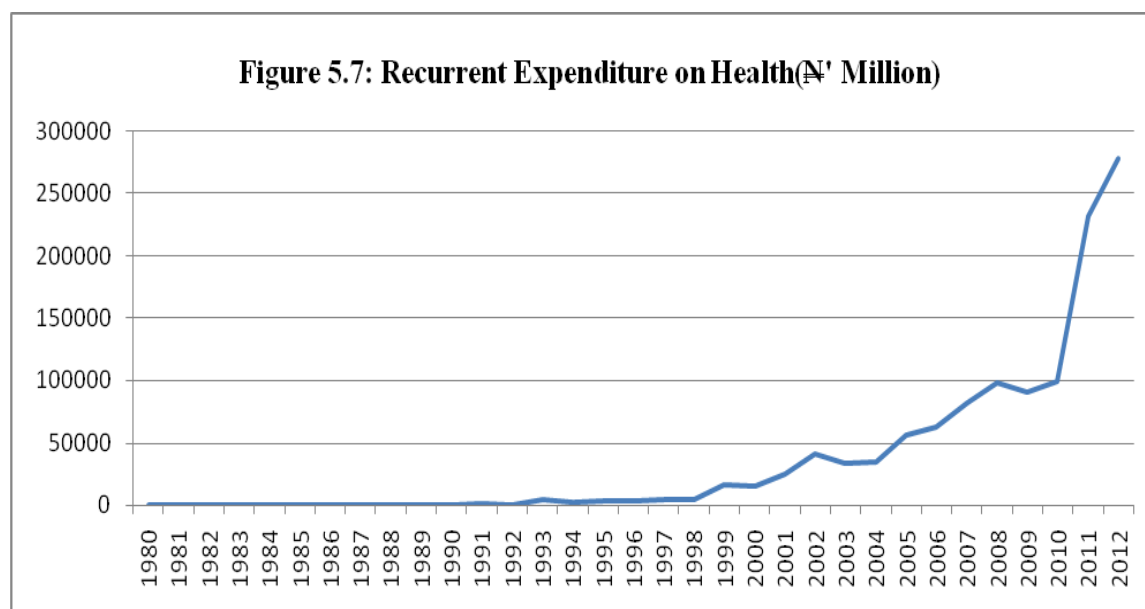
Source: Author's computation

Figure 5.6 shows the Recurrent Expenditure on Health of Nigerian economy in Millions over a time frame. Observation from the figure shows that Recurrent Expenditure on Health has been increasing over time but had been less than ₦1000 Billion between 1980 and 2000.

Figure 5.6: Capital Expenditure on Health (N' Million)

Source: Author's computation

However, from 2001, Recurrent Expenditure on Health exceeded ₦1000 Billion but with a quick fall in 2002 and 2004 respectively, but it later fell gradually from 2007 to 2009. Since then, it has been consistently increasing.

Figure 5.7 shows the Capital Expenditure on Health of Nigerian in Millions over a time frame. Observation from the figure shows that Capital Expenditure on Health has been increasing over time but had been less than ₦ 5000 Billion between 1980 and 2004. However, from 2005, Capital Expenditure on Health exceeded ₦ 5000 Billion and since then, it has been consistently increasing.

Figure 5.7: Recurrent Expenditure on Health(₦' Million)

Source: Author's computation

The OLS Result of the data is shown below:

Dependent Variable: RGDP

Method: Least Squares

Date: 08/17/14   Time: 10:39

Sample: 1981 2013

Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-68.96119	71.88971	-0.959264	0.3456
EXPHLTH	0.461971	0.265655	1.738993	0.0930
GFCF	1.072387	0.217428	4.932136	0.0000
TEXPEDU	0.927776	0.261345	3.550009	0.0014
TLBF	9.13E-06	2.15E-06	4.240306	0.0002

R-squared	0.981769	Mean dependent var	422.6909
Adjusted R-squared	0.979164	S.D. dependent var	220.8697
S.E. of regression	31.88179	Akaike info criterion	9.900675
Sum squared resid	28460.57	Schwarz criterion	10.12742
Log likelihood	-158.3611	Hannan-Quinn criter.	9.976967
F-statistic	376.9518	Durbin-Watson stat	0.962713
Prob(F-statistic)	0.000000		

The numbers in parenthesis under the parameter estimate of the corresponding standard errors. This establishes that the degree of error terms is considerably minimized and hence the estimates are reliable. The parameter estimates comply with a priori expectations which explain that quality of education is grossly dependent on the explanatory variables.

Considering the magnitude 1% increase in RGDP (proxy Economic growth) is brought about by 46% increase in (EXPHLTH) expenditure on health, 107% increase in (GFCF) gross fixed capital formation, 92% increase in (TEXPEDU) total expenditure on education, 0.00091% increase in (TLBF) Total labour force. This postulates that an increase in total expenditure on education and other related variables will lead to astronomical increase in real GDP, proxy for economic growth in Nigeria. The estimated value of R^2 (goodness of fit) of 0.98 or 98% shows that 98% systematic variation in Real GDP is caused by variation in total labour force, expenditure on health, total expenditure on education, and gross fixed capital formation. This equally ascertains that apart from the parameters or outside the scope of this analysis accounts for about 2% variation in the Economic growth which is covered by the error terms (µ).

The adjusted R^2 when the degree of freedom is considered with the number of explanatory variable also explains the 98% variation in Real GDP. However, the analysis is statistically significant.

The overall significance of the entire model or the goodness of fit of the model as measured by the F-statistic shows that the F-statistic calculated (F^*) is greater than the F-statistic tabulated (F) at 5% level of significance, hence we accept the alternative hypothesis that variation in, total labour force, unemployment rate, inflation rate, gross fixed capital formation, public expenditure on education and private expenditure on education grossly affected Real GDP which is proxy for economic growth in Nigeria and ultimately affect sustainable development in Nigeria. However, the analysis aligns with econometrical criteria and shows that the model has overall significance and the coefficients are stable.

Total expenditure on education [TEXPEDU] which is one of the important variables in the model shows a positive and significant relationship to Real GDP (RGDP). With probability value of 0.0014, this result shows that probability is less than 0.05. Hence, it shows that Total expenditure on education is a significant factor that affects positively the Real GDP in Nigeria and also increases the Economic growth. The result however is not surprising because from the A-prior expectation, it was clear that increment in [total expenditure on education] as human capital will enhance the country's Economic growth.

Gross Fixed Capital Formation (GFCF) which is also an important variable in the model shows a positive relationship with Real GDP and is also very significant. From the result it shows that a 1 percent increase in gross fixed capital formation (GFCF) will lead to 107% rise in Real GDP which is referred to as an astronomical increase or rise in RGDP [Economic growth]. This explains that when the government starts investing in fixed capitals such as plants and machinery, Factory, land and its buildings, patients, copyrights, goodwill, computing and communication infrastructure that mostly include work station, servers, data storage, facilities, local area network, the internet, telephone fax e.t.c., it would result in the existence of these things for long term needs. Gross fixed capital formation has shown a good and positive relationship with Real GDP and Economic growth in Nigeria which if invented in would help improve the real gross domestic products of Nigeria.

Expenditure on health (EXPHLTH) is also one of the models used and it shows a positive relationship with Real GDP and is also very significant. From the result it shows that a 1 percent increase in expenditure on health (EXPHLTH) will lead to 46% rise in Real GDP which is referred to as an astronomical increase or rise in RGDP [Economic growth]. This simply explains that when the government makes provision for investment on the health of its people, productivity will increase in the economy and an increase in the growth and development of the country is ensured.

Labour force [TLBF] which is positively related to Economic growth is a significant factor that determines economic growth in Nigeria since P<0.05 it was significant at 5% level of significance. This implies that a 1percent rise or increase in labour force will surely lead to about 0.00091% increase in Real GDP as well as (Economic growth) in the Nigerian Economy which shows an astronomical rise. When the Nigerian government invests in the quality of labour force, unemployment rate will reduce, for example formal labour which is a sort of employment that is structured and paid in a formal way, contributes greatly to the Nigerian Gross National Product which yields higher income and great benefits and securities for both men and women. From the result above it is shown that investment in the Nigerian labour force would improve the Real GDP (Economic growth) of the economy and would lead Nigeria into being a Developed Nation.

The F-statistic shows a value of approximately 376.5 which indicates that the overall model is significant with the probability value being P=0.00 which indicates a significance at 1 percent level.

The Durbin-Watson statistics shows a value of approximately 0.96 which shows the presence of positive serial correlation.

The Akaike information criterion and Schwarz criterion shows about 9.90 and 10.10 respectively which indicates that the model selection is good.

The Hannah-Quinn criterion also shows about 9.98 consequently the conformity with the expected sign indicates that there is a direct relationship between each of the variables and Educational Productivity.

For the Reliability of the result, white heteroskedacity-consistent standard errors & covariance with the HAC standard errors and covariance test were used simultaneously which gives the result pasted below:

White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-68.96119	69.05631	-0.998623	0.3265
EXPHLTH	0.461971	0.200809	2.300551	0.0291
GFCF	1.072387	0.256123	4.187001	0.0003
TEXPEDU	0.927776	0.223166	4.157328	0.0003
TLBF	9.13E-06	2.08E-06	4.391215	0.0001
R-squared	0.981769	Mean dependent var		422.6909
Adjusted R-squared	0.979164	S.D. dependent var		220.8697
S.E. of regression	31.88179	Akaike info criterion		9.900675
Sum squared resid	28460.57	Schwarz criterion		10.12742
Log likelihood	-158.3611	Hannan-Quinn criter.		9.976967
F-statistic	376.9518	Durbin-Watson stat		0.962713
Prob(F-statistic)	0.000000			

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-68.96119	92.12177	-0.748587	0.4603
EXPHLTH	0.461971	0.231015	1.999742	0.0553
GFCF	1.072387	0.300430	3.569509	0.0013
TEXPEDU	0.927776	0.245193	3.783865	0.0007
TLBF	9.13E-06	2.81E-06	3.245421	0.0030
R-squared	0.981769	Mean dependent var		422.6909
Adjusted R-squared	0.979164	S.D. dependent var		220.8697
S.E. of regression	31.88179	Akaike info criterion		9.900675
Sum squared resid	28460.57	Schwarz criterion		10.12742
Log likelihood	-158.3611	Hannan-Quinn criter.		9.976967
F-statistic	376.9518	Durbin-Watson stat		0.962713
Prob(F-statistic)	0.000000			

From both results above, R^2 remains the same and also with other statistical method of evaluation. However the model is reliable. This simply implies that the result is reliable for policy recommendation.

The above regression result has the consistent problem of auto-correlation which is shown by Durbin-Watson autocorrelation evaluation method with the result 0.96 for all three ways of statistical evaluation that shows consistent problem of auto-correlation.

However, the study makes use of different procedure to ensure that the results of the regression results are reliable. Breusch-Godfray tests were used to detect fitness of model. Durbin-Watson d test is simply the ratio of sum of the squared difference in successive residuals to the RSS. This test is used to find problem of autocorrelation in the model. To avoid some of the drawbacks of the Durbin Watson d test of the autocorrelation, Breusch and Godfray have constructed a test of autocorrelation that allows for: non stochastic regressors, such as the lagged values of the regressends; and higher order auto regressive schemes such as AR1, AR2.(Gujrati, 2004). The null hypothesis state that there is problem of auto-correlation while alternative hypothesis against it.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	5.327478	Prob. F(2,26)	0.0115
Obs*R-squared	9.592524	Prob. Chi-Square(2)	0.0083

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 08/17/14   Time: 10:44

Sample: 1981 2013

Included observations: 33

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.413319	64.41366	-0.099565	0.9215
EXPHLTH	-0.039610	0.233792	-0.169424	0.8668
GFCF	-0.017785	0.190112	-0.093550	0.9262
TEXPEDU	0.006196	0.230670	0.026860	0.9788
TLBF	2.28E-07	1.94E-06	0.117416	0.9074
RESID(-1)	0.617493	0.189715	3.254846	0.0031
RESID(-2)	-0.249475	0.195321	-1.277256	0.2128

R-squared	0.290683	Mean dependent var	8.08E-14
Adjusted R-squared	0.126994	S.D. dependent var	29.82269
S.E. of regression	27.86477	Akaike info criterion	9.678435
Sum squared resid	20187.58	Schwarz criterion	9.995876
Log likelihood	-152.6942	Hannan-Quinn criter.	9.785244
F-statistic	1.775826	Durbin-Watson stat	1.915126
Prob(F-statistic)	0.143459		

The result gives the probability values of Pro F(2 26)= 0.0115, and Prob chi-square(2)=0.0083 which is significant at 5% significant level and move against the Durbin Watson d test of presence of positive serial correlation. However the Breusch and Godfray test shows absence of serial correlation.

The wald test of significant impact of explanatory variable is presented below to show the single impact of Total expenditure on education(TEXPEDU) on economic growth, the null hypothesis of the test indicates that TEXPEDU is equal to zero c(4)=0, while alternative hypothesis is against it.

Wald Test:

Equation: Untitled

Test Statistic	Value	Df	Probability
t-statistic	3.550009	28	0.0014
F-statistic	12.60257	(1, 28)	0.0014
Chi-square	12.60257	1	0.0004

Null Hypothesis: C(4)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(4)	0.927776	0.261345

Restrictions are linear in coefficients.

Since the t-stat, f-stat and chi-square statistics probability value are less than 0.05 or 5%. Therefore, we conclude that total expenditure on education has a singleton significant impact on economic growth.

4.4 Granger Causality Test:

Correlation does not necessarily imply causation in any meaningful sense of that word. The econometric graveyard is full of magnificent correlations, which are simply spurious or meaningless. Economists debate that correlations are less obviously meaningless.

The Granger (1969) approach to the question of whether x causes y is to see how much of the current y can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. "X" is said to be Granger-caused by "Y" if it helps in the prediction of "X", or equivalently if the coefficients on the lagged' "X"s are statistically significant. Note that two-way causation is frequently the case; "X" Granger causes "Y" and "Y" Granger causes "X".

Eviews runs bivariate regressions of the form:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + ... + \alpha_l y_{t-l} + \beta_1 x_{t-1} + ... + \beta_l x_{-l} + \in_t$$

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + ... + \alpha_l x_{t-l} + \beta_1 y_{t-1} + ... + \beta_l y_{-l} + \mu_t$$

$$\beta_1 = \beta_2 ... = \beta_1 = 0$$

Therefore the granger causality test was used to test the econometric relationship between the variable under consideration. Null hypothesis state that X does not granger cause y while alternative hypothesis against it, Decision rule state that if the probability value is less than 0.5 reject H$_0$ if otherwise do not reject.

Pairwise Granger Causality Tests

Date: 08/17/14   Time: 12:31

Sample: 1981 2013

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause EXPHLTH	32	15.7968	0.0004
EXPHLTH does not Granger Cause GDP		0.01353	0.9082
TEXPEDU does not Granger Cause EXPHLTH	32	7.98029	0.0085
EXPHLTH does not Granger Cause TEXPEDU		6.44109	0.0168
TEXPEDU does not Granger Cause GDP	32	1.93139	0.1752
GDP does not Granger Cause TEXPEDU		11.1753	0.0023

From the result above it could be deduced that there is unidirectional granger causality between GDP and EXPHLTH, this implies that a well performing economy both at individual level and National level will be able to have adequate health status and this justifies the assertion that health is wealth .i.e. GDP granger cause expenditure on Health.

Also, there is bi-directional granger causality relationship between expenditure on education and expenditure on health. This implies that when the government finances education effectively, there will be skilled labour force that will help in financing health sector appropriately and vice-versa since a well healthy worker will be able to finance his/her family education.

4.5   IMPLICATION OF THE RESULT:

The Economic Implication of this result is that all the explanatory variables such as Gross Fixed capital formation (GFCF), Total labour force (TLBF), expenditure on health (EXPHLTH) and total expenditure on education grossly affect economic growth in Nigeria. The result also implies that when the government does not employ in order to increase total labour force or show concern about gross fixed capital formation by investing heavily on education, health and also create enabling environment for growth of private sector both in education and other sector such as health, it would lead to an astronomical fall in the real GDP of Nigeria which will hinder economic growth, but if the governments formulates policies and inaugurate empowerment programs in order to reduce the level of unemployment rate, increase its expenditure on health which will have a positive impact on the country's welfare, there is bound to be an increase in the real GDP and eventually, the economic growth of the country.

5.   SUMMARY, CONCLUSION AND RECOMMENDATIONS

Having reviewed some of the related literatures and collected all necessary data, which have been analyzed and discussed in chapter four, this chapter therefore provides a summary and conclusion. Recommendations were also made in line with the results and suggestions for further research studies were provided.

5.1 Summary:

The study focused on the impact of Human capital on economic growth in Nigeria. It set out a conceptual framework for analyzing the terms involved in the study such as economic growth, education, its forms as well as its levels. The research also examines education in Nigeria context in relation to its goals, history, policies and problems in the country and solutions to the highlighted problems.

Efforts were made to explain the impact of Human capital on economic growth as it is widely known that the productivity of an individual depends on his/her abilities and skills which are ultimately determined by the level of education and Health. Times series data were collected from 1981 to 2013 on Real Gross Domestic Product, Total Expenditure on Education, Gross Fixed Capital Formation, Expenditure on health, Total Labour Force, to show the relationship empirically with the use of multiple regressions [OLS] method. It was found that 98% systematic variation in Real GDP is caused by variation in total labour force, expenditure on health, total expenditure on education, gross fixed capital formation and generally caused by variation in Human capital development variables.

5.2 Conclusions:

The study shows the impact of Human capital development on Economic growth. The finding concludes that there is a clear cordial relationship between Total Expenditure on Education, Gross Fixed capital formation, total labour force, expenditure on health, and economic growth in Nigeria. The data shows that when or if government refuses to invest in the variables that is fixed and human capital, it would lead to a great fall in RGDP [Economic growth] of the country. Economic growth is achieved through sound education. If Education is believed to be the singular key that can unlock the door of development, there must be a change of attitude by the government functionaries in Nigeria as to keep up with the global trend.

The results of this research work is in line with Bakare (2006) who investigated the growth implications of human capital investment in Nigeria using vector autoregressive error corrections mechanism. He revealed that there is a significant functional and institutional relationship between the investments in human capital and economic growth in Nigeria and that 1% fall in human capital investment led to a 48.1% fall in the rate of growth in gross domestic output between 1970 and 2000. This ascertain the work of Beeker, Bowman and Harbison who all agree that increases in the value of aggregate output in relation to the increase in the existing factors of production is due to investment in human capital. The implication is that making investments in human beings as capital will in the long-run lead to improvement in production and a more rapid economic growth, Cited by (Adeagbo, 2010). Also, Babatunde and Adefabi (2005) investigated the long run relationship between education and economic growth in Nigeria between 1970 and 2003 through the application of Johansen cointegration technique and vector error correction methodology. Their findings revealed that a long run relationship exists between education and economic growth in Nigeria. A well-educated labour force appears to significantly influence economic growth both as a factor in the production function and through total productivity.

The study reveals that any improvement in Human capital will bring about a rise in RGDP (Economic growth). The study also showed that Human capital does not only contribute positively to economic growth in Nigeria, but the impact is strong and statistically significant.

5.3 Recommendation:

The following recommendations are made to improve the level of education in Nigeria:

1. The government should embark on policies that will encourage curriculum builders, teachers and students towards educational development.

2. The government should increase budgetary allocations to the educational sector of the economy.

3. The donor agencies like the world Bank, IMF[international monetary fund], UNDP,UNESCO etc should also be encouraged to inject funds into the educational sector, especially tertiary institutions.

4. School intake especially into the major institution should be of quality type. This will ensure quality graduates that are employable, with good results such as WAEC, NECO, and GCE etc.

5. The Nigerian educational system has been known to be exposed to large scale corruption, and gross inefficiencies. Corruption and mismanagement of fund should be adequately checked among educational stakeholders and to give more autonomy in financial management in public educational institutions. The autonomy will improve their financial situation by improving the efficiency and effectiveness of resource use and cutting costs. Besides, public educational institutions should be encouraged to develop resource mobilization strategies, in order to generate revenue by themselves. For this purpose, educational foundations can be set up in order to mobilize financial support from private donations.

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6. The government and the private sector must join hands by mobilizing resources to furnish Primary, Secondary and tertiary educational institutions, and equip then with adequate facilities such as Libraries, Laboratory equipments, computers and modern instructional materials in order to improve the quality of education and enhance human capital development, labour productivity, and ensure sustainable growth and development.

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