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Human Capital Investment and Economic Growth in Nigeria

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Abstract

The role of human capital in the growth process of any nation is crucial. It is a major tool for poverty reduction. The main aim of this paper is to carry out an empirical investigation on the relationship between investment in education, health and economic growth in Nigeria, using time series data from 1982 to 2011. This paper employs trend analysis, the Johansen cointegration and ordinary least square technique. Empirical findings however indicate that there is a long-run relationship between government expenditure on education, health and economic growth. The variables: health and education expenditure, secondary and tertiary enrolment rate and gross fixed capital formation appear with the expected positive signs and are statistically significant (except government expenditure on education and primary enrolment rate). The findings of this work have strong implications on education and health policies and considering that they are of great debate in the country. Therefore, this study recommends that in order to accelerate growth and liberate Nigerians from the vicious cycle of poverty, the government should put in place policies geared towards massive investment in the education and health.

Key words: *Economic growth, Human Capital, Education, Health and Gross fixed capital formation.*

Introduction

Overtime, various scholars have affirmed the role of investment in human capital on economic growth. Human capital is considered as the most valuable asset and needs to be mobilized (Awopegba, 2003). Human capital as an economic term encompasses health, education and other human capacities that can raise productivity (Todaro and Smith, 2003). Capital and natural resources are passive factors of production while human resources are active factors of production. Human capital constitutes the most valuable resource of a country; in its absence there will be the non performance of physical capital (tools, machinery, and equipment) which will impede economic growth (Harbison, 1964).

Health and education are two closely related human (resource) capital components that work together to make the individual more productive. One component cannot be considered important than the other (Lawanson, 2009). Health connotes the ability to lead a socially and economically productive life (Anyawu et.al, 1997). A healthy populace will be highly productive and the educated have the tendency to apply a degree of sophistication in the production process.

In political terms, investment in human capital prepares people for participation in the political processes, particularly as citizens in a democratic society. From the social, economic and cultural points of view, human capital investment helps to lead fuller and richer lives, less bound by tradition. It is a way to empower people; this in turn will help them contribute substantially to the growth process in the economy.

Human capital investment is crucial in the growth process of the Nigerian economy. Vision 20:2020 seeks to improve the educational system in terms of access, equity, infrastructure, teacher quality, and cumulative relevance, funding and planning. The millennium development goals (MDGs) slated to be fully achieved in 2015 also places emphasis on human capital. As a result of this, this research work will greatly explore the contribution of health and education in the growth process of Nigeria.

Lack of funding is the major problem of human capital. This has led to shortage of skilled personnel, unemployment and above all poverty. There can be no significant growth in any country without adequate investment in human capital. A typical example is the Asian tigers; Taiwan, Singapore; whose economies experienced sharp improvements via substantial investment in human capital.

It was recommended by the United Nations that developing countries should invest a minimum of 26% on education and the world Health Organisation specified

at least 5% on health. Nigeria has not been able to meet this bench mark. In 2012, the education sector got a meagre 8.4% of the budget while the health sector got about 6% (Source; 2012 National Budget-Provisional). The human development index (HDI) has three indicators: income, life expectancy (proxy for health), and knowledge (proxy for education). The rank of countries (as indicated in the 2011 report, page 131) showed that Nigeria ranked 156 with a value of 0.459 among 187 countries.

The millennium development goal 2 specified that primary education should be made free and compulsory by come 2015. However, the primary school enrolment rate in Nigeria has been reducing drastically over the years. The HDI 2013 report showed that Nigeria ranked 153 with a value of 0.471 among 187 countries. These are indications that investment in human capital is not given priority in Nigeria. Accordingly, there is the need to examine the level of government spending on the education and health sector and give policy recommendations as regards their inefficiencies so as to help curb the menace of poverty.

The broad objective of this study is to evaluate and analyze the impact of human capital investment on economic growth in Nigeria. In line with this broad objective, the specific objectives are to determine the relationship between investment in education, health and economic growth in Nigeria.

This research work is divided into five sections; the remaining sections are: Section two that covers the literature review, section three considers the methodology of the work. Section 4 entails an analysis of the findings while section five covers the summary of the findings, conclusion and policy recommendations.

Literature review

Several studies have empirically examined the impact of government expenditure on education and economic growth. The results vary depending on the model specifications and the data sets in use. Regardless of the model that was adopted, there seem to be a general consensus that education stimulates productivity and growth.

The idea of economic growth has evolved from its mere traditional outlook. Basically, for economic growth to translate to reduction in poverty and unemployment, it should be human centred (Wilson and Briscoe, 2003). The idea of human – centred development was given as a major prerequisite for the development by the UNDP's Human Development Report, 1990. This report was inspired by a mere focus on absolute growth oriented development which marginalized the social sector: education, health and others, yet failed to deliver robust growth or achieve poverty reduction as well.

Education is the process by which an individual gains knowledge or develops attitudes and skills. Education is a sound economic investment, which raises not only

the quality of life but also increases the productivity in market and non- market work. Education also improves health, productivity and access to paid employment Anyanwu et al (1997). The World Health Organization (WHO) defined health as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. Investment in health triggers development as only healthy people can contribute to the efficient production of output in an economy (Todaro, 2003).

Since independence in 1960, the Nigerian government has put in place various policies for education and health. The major one is the National Policy on Education and the Primary Health Care Scheme. The number of universities in Nigeria rose from five in 1970 to 24 in 1986. The number of enrolments at the various levels of educational institutions has continued to increase. (Dauda, 2010). However, these policies geared towards education and health has not made a significant impact due to structural defects in the Nigerian economy particularly the oil windfalls. Overtime, the allocation to these key sectors has been reducing. Since democratic era commenced in 1999, little priority has been given to education and health. In the year 2000, the percentage of the budget to education was 9.6%, this further reduced to 6.3% in 2005, 8.7% in 2007 and about 8% in 2012. All these are below the stipulated 26% bench mark by UNESCO. The emphasis has been on linear expansion in the size of the educational system without any broad and dynamic conception of the qualitative dimensions of the system (Dauda, 2010).

Several studies have attempted to empirically determine the relationship between human capital; education and health. Regardless of the model that was adopted, there seem to be a consensus that education stimulates productivity and growth. The interrelation between human capital investment and economic growth has a long history. Alfred Marshal (1930) in his research on "Principle of economics" asserted that the most valuable of all capital is that invested in human being and that it stimulates development in any nation. Adams Smith (1937) and Shultz (1961) also affirmed the importance of education on national development. Harbison and Myer (1964) in their study of education and economic growth concluded that since education is very crucial for national development, the political and economic forces in modern world will be such that practically all countries will have to raise their expenditure on human capital. Wilson and Briscoe (2003) in their study on impact of education and training found out that increased investment in education is shown to lead to higher productivity and earnings for the individual and similarly, such investment results in significant social rates of return. They also discovered that there is a spill over gain of investing in education to other sectors of the economy.

Barro (1996) argues that better health can reduce the depreciation of education capital, and thus increases the favourable effect of education on growth. This specifically explains the linkage between education and health in stimulating

growth. Barro (2001) also examined a panel data of around 100 countries. It was observed from the study that expenditures are found to constitute a form of investment. It increases the individual's chances of employment in the labour market, and allows him to get returns and gives him opportunities for job mobility. It is well known and widely accepted that education plays a great and significant role in the economy of a nation, investment in education is critical for economic growth and social cohesiveness of any society.

Lustig (2006) examined a direct relationship between health and growth in Mexico uses 1970-1995 data and uses life expectancy and mortality rates for different age groups as health indicators. He observed that health is responsible for approximately one-third of long term economic growth. He considered health to be an asset with an intrinsic value as well as instrumental value. According to him, good health is a source of wellbeing and highly valued throughout the world.

Musibau and Rasak (2005) carried out a study on the long-run relationship between education and economic growth in Nigeria using the Johansen's Co integration techniques. It was discovered that there is a long-run relationship between education and economic growth in Nigeria. They also found out that a long-run effect of a 1 percent increase of average years of schooling on output per worker while keeping the other variable constant is approximately 0.86 percent while the long-run elasticity of capital is 0.139 percent.

Bakare (2006) investigated the growth implications of human capital investment in Nigeria using the vector autoregressive error corrections mechanism. The study revealed that there is a significant functional and institutional relationship between the investments in human capital and economic growth in Nigeria. It was revealed 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. Dauda (2010) examined investment in education and economic growth in Nigeria using annual time series data from 1977 to 2007. The paper employs Johansen cointegration technique and error correction methodology. Empirical results indicate that there is a long-run relationship between investment in education and economic growth. The main variable of interest, the growth rate of educational expenditure had positive and significant effect on economic growth in Nigeria. The result indicates that educational investment plays a crucial role in developing an economy and it enhances growth in the nation's income. The coefficient of growth of gross fixed capital formation has positive and statistically significant effect on the Nigerian economy.

Adelakun (2011) conducted a study on human capital development and economic growth using OLS technique. It evaluates human capital 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. He concluded that there is a positive relationship between government expenditure on education and health as well as pattern of enrolment in primary, secondary, and tertiary institutions in enhancing economic growth in the long run.

In conclusion, evidence from the literature showed that education and health are crucial for economic growth. However, little emphasis has been placed on the health component of human capital. There is the need to explore the twin concept; education and health and how they stimulate growth and reduce poverty.

Research methodology

For the purpose of this research, the theory that will be adapted is the Human Capital Theory**.** This is because it places emphasis on human capital formation and how it stimulates productivity. Human capital theory sees education as a tool that increases the stock of human capacities available in a nation which then determines the level of economic growth.

This theory further explains that the stock of output in an economy can be consumed, Invested in physical capital and human capital. The equilibrium condition for the goods market is;

$$dK/dt + \square K + dH/dt + \square H = [s' + s'']Y$$

$\square$ denotes the depreciation rate. The share of output devoted to gross physical capital formation is s' and the share devoted to human capital formation is s''. (s' and s'' are positive parameters).

In summary, the human capital theory places emphasis on investment in humans than in physical capital because the human capital works on the physical capital through adequate skill being acquired to operate the physical capital in place. This prepares the country for a better future since the productive capacity of individuals is improved, thus economic growth will be enhanced.

The productivity in an economy depends on the level of efficiency of labour and capital inputs. Increase in investment in human capital will bring about the efficient use of labour and capital resources. The framework adopted in this study is similar to that of Dauda (2010) and Adelakun (2011). These works rely on Solow (1957), Mankiw et al (1992) and Lucas (1988). Solow attempts to explain long-run economic growth by looking at capital accumulation, labour or population growth, and increases in productivity, commonly referred to as technological progress.

 Where

y = output,

k = capital and

L = labour

According to Solow, a single output is produced using two factors of production; Labour and capital and the elasticity of substitution must be asymptotically equal to one

$$Y(t) = K(t)^{\beta}(A(t)L(t))^{1-\alpha}$$

Where t denotes time, $0 < \alpha < 1$ is the elasticity of output with respect to capital, and Y (t) represents total production. "A" refers to labour-augmenting technology or Knowledge thus AL represents effective labour. All factors of production are fully employed, and the number of workers i.e. labour, as well as the level of technology grows exogenously at rates Ω and g respectively.

The number of effective units of labour, A(t)L(t), therefore grows at rate (Ω + g) while, the stock of capital depreciates at a constant rate. However, only a fraction of the output (cY (t)) with $0 < c < 1$ is consumed leaving S=1-c for investment. N. Gregory Mankiw, David Romer and David Weil extended the Solow model. They created a Solow Swan Augmented version by including human capital. This extended model, output and marginal product of capital (K) are lower in poor countries because they have less human capital than rich countries.

The Augmented model is similar Solow's and it is of the Cobb–Douglas type:

$$Y(t) = K(t)^{\alpha} H(t)^{\beta} (A(t)L(t))^{1-\alpha-\beta}$$

Where H (t) is the stock of human capital which depreciates at the same rate "ǫ" as physical capital

Like in the Solow model, a part of the outcome sY(t), is saved each period but in this instance it is partly invested physical and partly in human capital, such that

S= S_K+ S_H

The above equation brings about two dynamic equations in the model

K= S_K $k^{\alpha} h^{\beta}$ - (n+g+ ǫ) k

H= S_H $k^{\alpha} h^{\beta}$ - (n+g+ ǫ) k

The equilibrium path is determined by k= h= o which means SK $k^{\alpha} h^{\beta}$ - (n+g+ ǫ) k = 0 and SH $k^{\alpha} h^{\beta}$ - (n+g+ ǫ) k = 0. In the steady state of equilibrium, y* = (k*) α + (h*) β

The augmented Solow model as specified by Mankiw, Romer and Weil (1992) can be used to set up a linear regression of the impact of human capital; education and health on economic growth. In this vein, the model below was employed in an attempt to

determine the impact of investment in education and health on economic growth in Nigeria.

GDP = f (GEOH, GEOE, GFCF, PER, SER, TER).   …equ (i)

GDP = βo + β1 GEOE + β2 GEOH + β3 GFCF + β4PER+ β5SER+ β6TER+ μt

…equ (ii)

Based on the assumption of linearity of the variables, we take Log of both sides Therefore, the model will be:

Log GDP = βo + β1log GEOE + β2log GEOH + β3log GFCF + β4PER+ β5SER+ β6TER+ μt   …equ (iii)

The variables specified in the model can be defined as:

Dependent Variable

GDP   - Real Gross Domestic Product

Explanatory/Independent Variables are:

GEOE - Government Expenditure on Education

GEOH - Government Expenditure on Health

GFCF -Gross Capital Formation

PER - Primary Enrolment Rate

SER - Secondary Enrolment Rate

TER - Tertiary Enrolment rate

The apriori expectations are β_1, β_2, β_3, β4, β5 and β6 > 0. This implies that all the dependent variables of the model have positive relationship with economic growth.

The above model is also consistent with the work of Adelakun (2011). However, this study seeks to contribute to knowledge in terms of method of analysis (Trend analysis and Inferential Statistics), the data employed (extended to 2011), and the policy recommendations.

In order to empirically determine the relationship between investment in education, health, school enrolment rates, gross fixed capital formation and economic growth in Nigeria for the period 1982-2011, using trend analysis and cointegration techniques. The data for the empirical analysis were obtained from the Statistical Bulletin published by the Central Bank of Nigeria.

Empirical results and discussions

Trend analysis (1982-2011) in N' Million

The trend line below shows that REALGDP has been increasing over the years. This can be attributable to the increased revenue gotten from crude oil. Government expenditure has also been increasing over the years but has little impact on growth and development. For instance, the rank of countries (as indicated march 4, 2013 report) showed that Nigeria ranked 153 with a value of 0.471 among 187 countries. This tells of the fact that human capital is not given the optimum preference in Nigeria compared to the Asian tiger: Singapore that ranked 18 with an HDI of 0.895 because she concerted her effort on the educational sector.

Since 1960, government expenditure on education continues to increase, although it has not yet met the 26 percent UNESCO recommendation. As at 2010, the federal government of Nigeria approved six more federal Universities to be sited in each of the six geopolitical zones. (Rasaki, 2011) . Inherent in all these are gross inefficiency, corruption, malpractices and a lack of adequate accountability. This is why the rate of poverty in the country keeps on increasing over the years. Poverty incidence as at 2010 and 2011 were 69% and an estimated 71.2% respectively. (NBS Poverty Profile Report, 2010)

The trend of the school enrolment at the primary, secondary and tertiary level also leaves much to be desired in the Nigerian economy particularly when we look at the primary enrolment rate. In the 80's, primary enrolment rate was indeed at its peak mainly because of the emphasis on free primary education particularly in the West. School enrolment rates keep on reducing over the years.
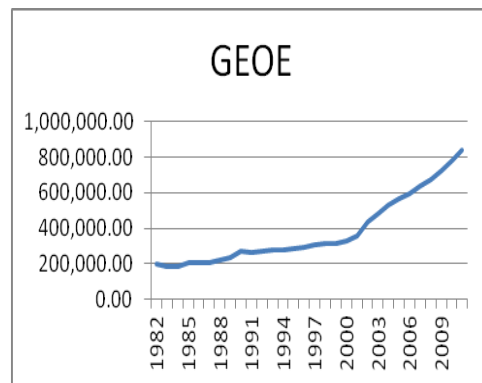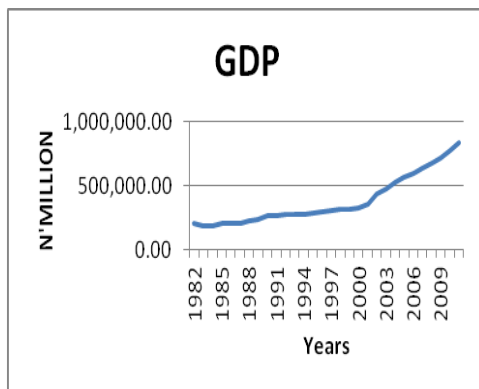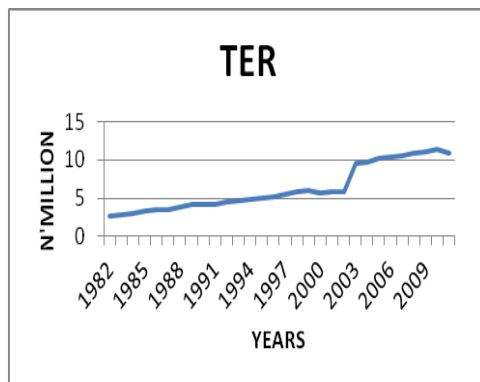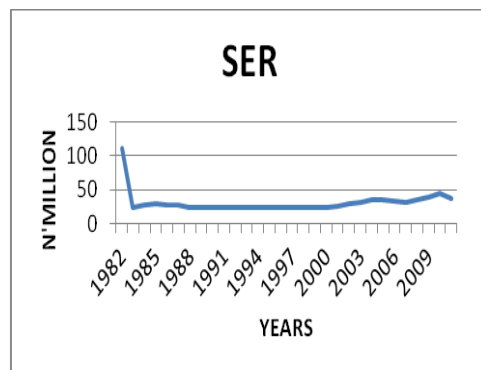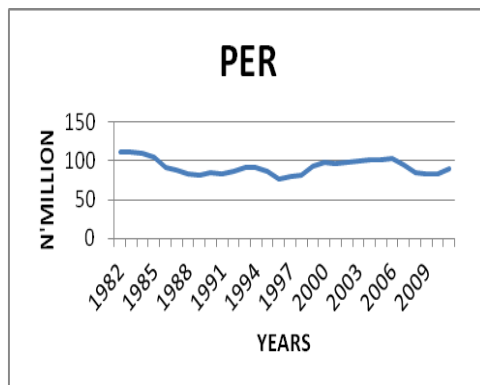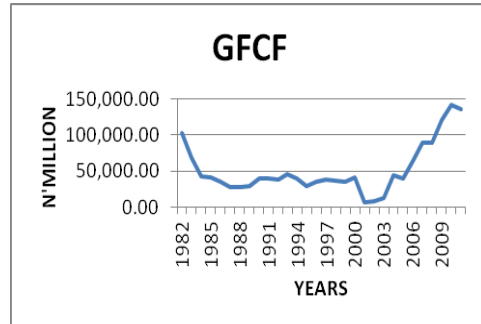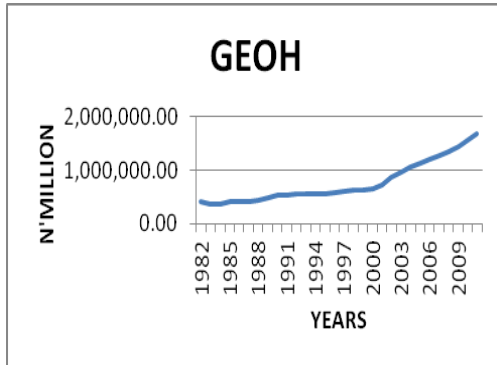
*GDP: Real Gross Domestic Product

*GCOE: Government Capital Expenditure on Education

*GROE: Government Recurrent Expenditure on Education

*GFCF: Gross Fixed Capital Formation

*PER: Primary Enrolment Rate

*SER: Secondary Enrolment Rate

*TER: Tertiary enrolment rate

Unit root tests

Standard econometric methodologies assume stationarity in the time series while they are in the real sense non-stationary. Hence the usual statistical tests are likely to be inappropriate and the inferences drawn are likely to be erroneous and misleading (Dauda, 2010). The essence of testing for unit root is because if the series is not stationary then all the results from the classical linear regression analysis are not valid.

From the results below, the model used is not spurious i.e the variables are stationary, since the Augmented Dickey Fuller value is greater than the critical values of the variables

Table 1: Results of Unit Roots Tests using Augmented Dickey Fuller (ADF)

SERIES	ADF	Critical value at 5%	Order of Integration
D(LOGGDP)	3.281082	2.9750	I(1)
D(LOGGEOE)	5.322501	2.9750	I(1)
D(LOGGEOH)	5.176788	2.9750	I(1)
D(LOGGFCF)	3.609027	2.9750	I(1)
D(PER)	2.839776	2.9750	I(1)
D(SER)	3.557783	2.9750	I(1)
D(TER)	3.381312	2.9750	I(1)

*significant at 5 percent level

Source: Author's Computation

Cointegration test

Having tested the stationarity of each time series, the next step is to test for co integration between the variables. The Johansen procedure is used to identify long run relationship among the variables. Co integration of the dependent variable with the independent variable forms a dynamic basis through which forecast can be made.

The table below shows that the dependent variable GDP is cointegrated with the independent variables. The trace statistics is greater than the critical values at 5% level of significance for at least 3 equations; this indicates a rejection of the null

hypothesis of no co integration in favour of three cointegration relationships between the variables. The result further explains that there is long run relationship between the variables.

Table 2: Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.876141	175.3379	125.6154	0.0000
At most 1 *	0.812785	116.8567	95.75366	0.0008
At most 2 *	0.600725	69.94273	69.81889	0.0489
At most 4	0.353311	21.98587	29.79707	0.2993
At most 5	0.279507	9.780972	15.49471	0.2980
At most 6	0.021272	0.602033	3.841466	0.4378

* Denotes rejection of the hypothesis at 5% significance level.

L.R. test indicates 3 cointegrating equation(s) at 5% significance level.

Regression results

The result in table 3 below shows that contrary to the a priori expectation, GEOE and PER exerts negative influence on the GDP in Nigeria. This is indeed a paradox and raises further questions. However, the result further shows that Government Expenditure on Health, Gross Fixed Capital Formation, Secondary and Tertiary Enrolment rates conformed to apriori expectations with the expected positive signs.

The adjusted R^2 is 97 percent. By implication, this shows that over 97 percent of the variations in real GDP growth can be explained by the independent variables. This shows a goodness of fit of the regression. The F-statistics of 178.8 shows that the explanatory variables are important factors determining the GDP growth rate in Nigeria. when tested for significance, the effects of GEOH, PER and TER on economic growth were statistically significant as evidenced by the t-statistic values of, 2.422701, 2.203881 and 7.129606 respectively and their corresponding probabilities of, 0.0237, 0.0378 and 0.000, respectively. GEOE, GFCF and SER show an insignificant effect on economic growth in Nigeria judging from their t-statistic value of 1.644743, 0.153500 and1.516577 and probability values of 0.1136, 0.8793 and 0.1430 respectively. The Durbin-Watson statistics of 1.5 indicates little severity of auto-correlation.

Table 3: Regression results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.01373	0.381948	31.45382	0.0000
LOG(GEOE)	-0.108245	0.065813	-1.644743	0.1136
LOG(GEOH)	0.156417	0.064563	2.422701	0.0237
LOG(GFCF)	0.004028	0.026243	0.153500	0.8793
PER	-0.003783	0.001716	-2.203881	0.0378
SER	0.001612	0.001063	1.516577	0.1430
TER	0.102250	0.014342	7.129606	0.0000
R-squared	0.979013	Mean dependent Var		12.73763
Adjusted R-squared	*0.973538*	F-statistic		178.8203
Durbin-Watson stat	1.578277	Prob(F-statistic)		0.000000

Source: Regression Output

The non contribution of government expenditure on education is not surprising considering the fact that the United Nations specified that basic education should be made free, universal and compulsory. it was also recommended that developing nations should invest a minimum of 26% of their budgetary allocation on the educational sector in order to trigger economic growth. Ironically, Nigeria's budgetary allocation to education is nothing to write home about. The budgetary allocation to Education as a percentage of the total budget was a meagre 8.4% in 2012 (Source: 2012 National Budget- Provisional).

Primary education is expected to be free across the federation but what is discovered is the contrary. In 1982, primary enrolment rate was 111.32 while in 2011 it was 89.688. This inefficient allocation to the education sector has its effect on the macro economic performance of the country especially in terms of rising unemployment and inflation, low industrial productivity, increased poverty amongst others. Gross fixed capital formation was largely insignificant. This explains that the government have drifted attention away from investing in physical infrastructures or capital goods, the amount allocated to recurrent spending as at 2012 was over 75% of the total budgetary allocation.

Generally, the non contribution of education to economic growth in Nigeria can be attributed to structural and institutional defects, inefficiency and ineffectiveness of the Government in general. Inadequate infrastructure such as lack

of research materials and lack of well equipped libraries, strikes and distortions in the educational sector also explains why investment in education exerts a negative influence on the GDP. The effect of this back drop is unemployment, balance of payment deficit as a result of increase in the importation of experts and ultimately poverty. Even though results of this research reflects health as a contributing sector to economic growth occasioned by its positive and significant impact, the importance being placed on education and health in Nigeria is relatively low compared to other developing and developed countries.

The results from this corroborates with the findings of Ayara (2003) which indicated a negative insignificant relationship between government expenditure on education and economic growth , Bloom and Canning (2003) and Odior (2011) which indicated a positive and significant relationship between government expenditure on health and economic growth. However, the result of the study does not tally with the findings of Ayeni (2003) and Dauda (2010) which suggest a positive significant relationship between government expenditure on education and economic growth

Summary, conclusion and policy recommendations

This study provided evidence on the impact of investment in Education, Health, Gross Fixed Capital Formation and School Enrolment rates on economic growth in Nigeria, using the trend analysis, cointegration and regression techniques. The study found that investment in education in Nigeria is insignificant and fall below the recommendations of the United Nations while health contributed positively to economic growth.

By implication, there is the need for the government in Nigeria to comply with the bench mark of 26% specified by UNESCO. In addition, the government should adopt efficient planning and monitoring. The Government should also allocate more to capital expenditures on education and health; provide facilities such as libraries, laboratory equipments, computers and modern learning equipments. Donor agencies like the World Bank, United Nations Development Programme (UNDP), United Nations Education, Scientific and Cultural Organization (UNESCO), etc should also be encouraged to inject funds into the educational and health sectors.

Furthermore, autonomy should be given to public educational and health institutions. They should be given the opportunity to generate funds internally and ensure proper planning and management of the same. The fund that goes into the recent tertiary education fund created by the tax reform of the TETFUND act, 2011 should be allocated without bias among the tertiary institutions in the country. The government should also look into the proper adjustment of the curricular of learning. In order to increase the enrolment rate in institutions of learning, there is the need for the implementation of the free Universal Basic Education (UBE) and free health care programs at the federal, state and local government levels. The government should

create an enabling environment in order to encourage private sector investment in the education and health sector.

There is also the need to improve on the pay package of the health workers and teachers at all levels of education. For example, it took six months (July-Dec) before the government and the academic staff union came to a consensus as regards better pay and infrastructural advancement in 2013.

Above all, a major bane to the progress of the Nigerian economy is corruption. It is recommended that the government should see to the level of corruption in the education and health sector, there should be proper machinery put in place and a system that severely punish corrupt officials.

In conclusion, emphasis on human capital will have a spill over effect on every sector of the Nigerian economy, lead to increased output and ultimately reduction in poverty.

Acknowledgements

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