Human Capital Development and Per Capital Income in Nigeria: an Error Correction Model

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Abstract

This paper seeks to examine the role of human capital development on per capita income in Nigeria. The study adopted time series data of human capital indicators and per capita income in Nigeria and econometrics tools were used for testing the stationarity, causality, long run and short run impact of the dependent variable (Per capita income in Nigeria) and the independent variables (Government Expenditure Education, Government Expenditure Health, Life Expectancy in Nigeria, Primary School Enrolment, Secondary School Enrolment and Tertiary Institutions Enrolment). The data were found to be stationary at various levels and there was causal relationship among some variables. Both the long run and short run results showed that there is a positive relationship between human capital development and per capita income in Nigeria given the R-squares of 93 and 98 percent respectively. In the long run Government Expenditure on Health, Secondary School Enrolment and Tertiary Institutions Enrolment have negative impact on per capita income while Government Expenditure on Education, Life Expectancy in Nigeria and Primary School Enrolment have positive impact on per capita income. In the short run all the variables were statistically significant and have positive impact on per capita income except Government Expenditure on Health. From the findings human capital development can be a strong economic tool in improving per capita income and standard of living in Nigeria and also from the study one of the major problems of human capital development for sustainable per capita income and standard of living in Nigeria is poor education and health service delivery in Nigeria. Therefore, the study recommends that our education and health policies should be viewed and redesigned to meet the current education and health needs for sustainable high standard of living and improved Per Capita Income in Nigeria.

Keywords: Human Capital, Per Capita Income, Development, Education, Health

Background to the Study

Education and health are the basic objectives of development because they are important ends in themselves. Health is central to well-being, and education is essential for satisfying and rewarding life: both are fundamental to the broader notion of expanded human capabilities that lie at the heart of the meaning of development (Lawanson & Marimathu, 2009). The Nigerian economy could be said to have enjoyed some macro-economic stability in the recent time as its rate of economic growth averaged 2.01 percent within the last two decades (World Bank, 2010). However, as a result of high and rapid growth rate of the population, per capita growth rate has remained negative and it averaged -0.852 (World Bank, 2010). World Bank (2004), with its large reserves of human and natural resources, Nigeria has the potential to build a prosperous economy, reduce poverty significantly, and provide health care services, education, and infrastructural services that its population needs. Nevertheless, despite the country's relative oil wealth, poverty is widespread and Nigeria's basic social indicators place it among the twenty poorest countries in the world World Bank (2004). Oladeji and Adebayo (1996), human resources are a critical variable in the growth process and worthy of development. They are not only means but more importantly, the ends that must be served to achieve economic progress.

It has been stressed that the differences in the level of socio-economic development across nations is attributed not so much to natural resources and endowments and the stock of physical capital but to the quality and quantity of human resources. Capital and natural resources arepassive factors of production; human beings are the active agents who accumulate capital, exploit naturalresources, build social, economic, and political organizations, and carry forward national development (Sarah, Adam, Ben & Yelwa, 2015). Clearly, a country which is unable to develop the skills and knowledge of its people and to utilize them effectively in the national economy will be unable to develop anything else". Investment in human capital plays an important role in increasing competitiveness, improving quality of life of the population and in generating economic growth and development of a country Current clearly shown that Nigeria wishes to be among twenty most developed countries in the world by year 2020.

To give effect to this, one of the pre-requisites is to ensure that capable manpower is available in various areas of social, political, institutional, technological and economic endeavours which drive the process of growth, development and industrialization. Consistent with the NEEDS programme of 2004, and the current Vision 20: 2020 development programme agenda, the country's human resource development needs to be strengthened and stabilized in order to accelerate economic activities and trigger off higher productivity, income and economic growth and development (Sarah et. al, 2015). The nation's aspiration to be in the league of 20 leading economies in the world by Year 2020 emerged on the realization that the endowment of Nigeria in material and human resources places her in good position to achieve this greatness. But the Human Development Report of UNDP (2008) shows that Nigeria is still at the low level of human development compared to countries in emerging economies. This is due to the fact that Nigerian human capital indictors especially the education and health sectors in

Nigeria have not efficient and live up to expectation this has hinder the nation's aspiration to be in the league of 20 leading economies in the world.

Despite the government investment in Human Capital development, the educational sector in Nigeria is beclouded by uncertainties. Most schools in Nigeria are characterized by overcrowding, poor sanitation, poor management, low students-teachers' ratio, poor teachers' remunerations and welfare packages. Other problems include abandoned capital projects, inadequate funding, poor condition of service and others, (Federal Republic of Nigeria, 2000). The health sector also is faced with multitude of problems which are summarized as: Inequitable availability of services; Multiple providers; public and private; Provider behavior to clients; Case management: poor adherence, Physical infrastructure, equipment; Drug supplies, supply systems; Service management capacity; Lack of effective regulation or legislation to affect both public and private actors; Weak links between programmes leading to inefficiencies and competition for limited resources; currently, a great deal of attention is being placed on scaling up service delivery to achieve the Millennium Development Goals (MDGs) in Nigeria. The challenges of these major human capital development indicators have affect the efficiency of labour force, increased unemployment, poverty rate, productivity rate, decrease in life expectancy rate and these problems have resulted to low per capita income in Nigeria. Therefore, the objective of this paper seeks to examine the role of human capital development on per capita income in Nigeria.

Literature Review
Stylize fact about Human Capital Development and Per Capita Income in Nigeria
To Okojie (1995) human capital refers to the "abilities and skills of the human resources of a country." In the words of Marimuthu, Arokiasamy & Ismail (2009) human capital simply refer to the "processes that relate to training, education and other professional initiatives in order to increase the levels of knowledge, skills, abilities, values, and social assets of an employee which will lead to the employee's job satisfaction and performance." according to Ojo (1998) is the process of increasing the knowledge, skills and capabilities of people. He further identified the following five major means of developing human resources, formal education, training, extension services, health services and migration. He however, singled out formal education as constituting a strategic component of human resource development. Therefore, education is synonymous with human capital development. Human capital development is concerned with the provision of opportunity to increase one's skill and knowledge through training.

Sarah et al. (2015) the role of human resource in encouraging economic progress has been acknowledged in many studies. Human resource has been identified not only as a major growth determinant and a channel to ease poverty but it is also very important in building or improving the quality of human beings in general (Sarah et al., 2015). The growth focus in Millennium Development Goals (MDGs) is more concentrated at the importance in achieving clear and real progress as an indicator or human capital

indicator measured through educational foundation. Most studies have examined the effect of education through human capital investment on economic growth. The inter-relationship between human resource and economic growth has extensively been discussed in the literature. Ramirez and Stewart (1997) explain that although there are bilateral ties between human capital resource and economic growth, specific factors to link them still lacks in the aspect of systematic exploration. They show that high level human resource capital development will affect the level of the economy through population's increase in their capacity, productivity and creativity.

The population's education will determine their ability to absorb and organize all economic growth resources such as technology usage or technological innovation. Studies conducted in Indonesia examined the inter-relationship between human capital development and economic growth from the economic crisis experienced in the country. Akita and Alisjahbana (2002) explain that areas having quality of human resource are able to cope better when facing an economic crisis. In his study, Wibisono (2001) included variables such as educational attainment which is measured as successful completion of educational level, life expectancy, fertility rate, infant mortality and rate of inflation. Result of his analysis shows that positive influential variables towards economic growth are education, life span and infant mortality. The study shows that human capital, in the form of education especially, is the most important contributor to economic growth.

According to Wibisono (2001) the Indonesia Human Development Report also confirms that there indeed exists a bilateral tie between human capital development and economic growth. A recent study by Mansur *et al*. (2009) found that education provides better employment opportunities and thus, increases the level of income of an individual. Therefore, education is perceived to be an important factor in human capital formation. The study also found that a correlation exists between education investment among women and fertility. In Africa, educated women are able to get higher wages, and tend to have educated children.

Conclusively, the research by the DHS as cited in Hobcroft (1993) shows that the inter-relationship between education and fertility differ according to education levels whereby there is a negative relationship for women who complete secondary school education and fertility. It is noteworthy that since the advent of civilian rule in 1999, growth performance has improved significantly. The last seven years witnessed an average growth rate of about 6 percent (UNDP, 2009). However, economic growth has not resulted in appreciable decline in unemployment and poverty prevalence. Human development has remained unimpressive as shown by the indicators in the 2.3 Table below. Where zones represent the six geo-political zones in Nigeria, HDI is the Human Development Index, HPI is the Human Poverty Index, GDM is the Gender Development Measure, GEM is the Gender Empowerment Measure and INQ is the Inequality Measure.

Table 2.3: Nigeria's Human Development Summary Statistics by Zones, 2008

Zones	HDI	HPI	GDM	GEM	INQ
North-Central	0.490	34.65	0.478	0.244	0.49
North-West	0.420	44.15	0.376	0.117	0.44
North-East	0.322	48.90	0.250	0.118	0.42
South-West	0.523	21.50	0.507	0.285	0.48
South-East	0.471	26.07	0.455	0.315	0.38
South-South	0.573	26.61	0.575	0.251	0.41

Source: United Nations Development Programme (2009), Summary: Human Development Report Nigeria. Abuja: UNDP.

Sarah et al. (2015)over the years, successive Nigerian Governments recognized the importance of human capital formation in the development process and have embarked on various programmes and projects which led to the establishment of educational institutions and health centres throughout the country. However, in the late 1970s and early 1980s, Federal Government spending grew substantially resulting in fiscal crisis, inflation, and heavy borrowings. Subsequently, through the austerity measures adopted in 1982 and Structural Adjustment Programme (SAP) introduced in 1986, the country attempted to bring down fiscal deficits as part of its stabilization and adjustment programmes, often by reducing public spending on across-the board basis. These reductions resulted in unprecedented economic and social costs as human resources development was neglected with adverse long-term development consequences (Oyinlola and Adam, 2003). Thus, the ultimate goal of economic development which underscored the need to improve the well-being of people was overlooked. In more recent times, renewed attention was paid to the role of human capital formation in the country's development process and this has prompted the federal government to declare in its 1999-2003 economic policy programme that the economy exists for and belongs to the people, and at all times the general well-being of all the people shall be the overriding objectives of the government and the proper measure of performance. This policy statement of the government is further reiterated in the National Economic Empowerment and Development Strategy (NEEDS). The provision of high-quality education and health care to all the country's citizens is considered a key element of public policy by all levels of government. Against the above background, the aim of this study is to examine the impact of human capital indicators on economic growth in Nigeria between 1980 and 2014 and on the basis of the findings, recommend policies and measures for improving human capital development in the country.

Theoretical Framework

Modern economic growth depends on the accumulation of physical capital and an increase in labour force with improved technological embodiment without which labour cannot be effective. Human capital is a factor influencing labour productivity because it facilitates the absorption of new technology, increases the rate of innovativeness and promotes efficient management (Adamu, 2003). Consequently, for high labour productivity, an integral part of technological progress is investment in human capital and thus is termed endogenous factor because accumulation of physical capital is enhanced by the knowledge, skills, attitudes and health status of the people who partake in such exercise. Thus, there is a strong and positive relationship between human capital development and economic growth.

In this regard, several studies have attempted to integrate exogenous forces with endogenous factors in explaining economic growth across countries by using augmented Solow neoclassical production function. These studies include, but not limited to, the following; Romer (1990), Mankiw, Romer and Weil (1992), Gemmell (1996), Grammy and Assane (1996) and Chete and Adeoye (2003). Generally, the impact of human capital on economic growth is incorporated according to the Mankiw, Romer and Weil (1992) framework and is given below as:

$$Y_{(t)} \quad = \quad K_{(t)} \quad H(t) \quad (A_{(t)} L_{(t)})^{1-} \qquad \qquad 2.1 \text{ Where;}$$

Y is output; K = Physical capital and H = the Human Capital Stock; L=Labour force; A is level of technology and, 1, implying decreasing returns to capital. By implication, there is a strong and positive relationship between investment in human capital and output growth.

From equation 2.1 linearizing the equation the Y (the output) is function of; K = Physical capital and H = the Human Capital Stock; L=Labour force; A is level of technology, which will give us equation 2.2 as:

$$Y \quad = \quad f(K, H, A, L) \qquad \qquad 2.2$$

If equation 2.4 is written as econometrics model we the following equation

$$Y_t \quad = \quad + {}_1K + {}_2H + {}_3A + {}_4L + U_t \qquad \qquad 2.3$$

From equation 2.3 it clearly shown that Y (output) is function of K = Physical capital and H = the Human Capital Stock; L=Labour force; A is level of technology. From equation 2.3 above the equation can be simplified by taking the Y (the output) as a function human capital stock.

$$Y_t \quad = \quad + {}_1H + U_{t...} \qquad \qquad 2.4$$

The human capital stocks from the objective of the study are determinants of Human Capital Development in Nigeria. Therefore, Y (the output) will be the function of determinants of Human Capital Development in Nigeria which is stated below as:

$$Y_t \quad = \quad +\,_1 +\,_2 + \ldots\ldots\ldots\ldots\ldots\ldots\ldots U_t \hspace{4cm} 2.5$$

The equation 2.5 above will form the framework in which the models of the study will stand which will be stated in chapter three of the research work.

Methodology
Sources of Data and Method of Analysis
To assess the impact of human capital development on per capita income in Nigeria, the study adopted time series data covering the period 1980 to 2014. The data are Per Capita Income in Nigeria (PCY), Government Expenditure Education (GEE), Government Expenditure Health (GEH), Life Expectancy in Nigeria (LEN), Primary School Enrolment (PSER), Secondary School Enrolment (SSER) and Tertiary Institutions Enrolment (TIER).See regression data in table 4.1 appendix I. The study used Ordinary Least Squares multiple regression model for examine the long run impact and relationship between human capital development and per capita income in Nigeria. While Error Correction Model is used to examine the short run impact of human capital development on per capita income in Nigeria.

Model Specification
Ordinary Least Squares Model (Multiple Regressions)
This model is the central model of study that take into account all exogenous variables and the endogenous variable. The Ordinary Least Squares is formulated as follows:

$$PCY = f\left(GEE, GEH, LEN, PSR, SSER, TIER\right) \hspace{3cm} 3.1$$

Equation 3.1 show the functional relationship between the dependent variable Per Capita Income in Nigeria (PCY) and the independent variables that is Government Expenditure Education (GEE), Government Expenditure Health (GEH), Life Expectancy in Nigeria (LEN), Primary School Enrolment (PSER), Secondary School Enrolment (SSER) and Tertiary Institutions Enrolment (TIER). The model shows the mathematical functions of the economic variables. To express the equation as an econometric equation there is the need for a constant (), Parameters ($_{1,\,2,\,3,\,4}\ldots\ldots\,_n$) and the error term ($\varepsilon_t$) in the equation. Therefore, the equation 3.18 can be expressed as an econometric model as follows:

$$PCY = +\,_1 GEE + \,_2 GEH + \,_3 LEN + \,_4 PSER + \,_5 SSER + \,_6 TIER + \varepsilon_t \hspace{1cm} 3.2$$

In regression analysis the logs of variables are routinely taken, not necessarily for achieving a normal distribution of the predictors and/or the dependent variable but for interpretability. Interpreting a log transformed variable can be done in terms of percent change.Therefore, the model 3.2 can be expressed by taking the natural log of the economic variables (independent and dependent variables) and adding the log to each variables as given below.

$$logPCY = \alpha + \beta_1 logGEE + \beta_2 logGEH + \beta_3 logLEN + \beta_4 logPSER + \beta_5 logSSER + \beta_6 logTIER + \varepsilon_t$$

....   3.4

The equation 3.4 above is the econometric model for long run regression analysis for this study.

Modelling Error Correction Model (ECM)

The building of Error Correction Model (ECM) starts with the basic structure of Error Correction Model (ECM) which is stated as:

$$\Delta Y = \alpha + \beta X + \beta \Delta X_{t-1} - \beta EC_{t-1} + \varepsilon_t \qquad 3.5$$

Where: ΔY is the output that is gross domestic product which is used as a proxy for economic growth in Nigeria. The βX present the ten endogenous variables i.e $(GEE, GEH, LEN, PSER, SSER, TIER)$ which are Government Expenditure Education (GEE), Government Expenditure Health (GEH), Life Expectancy in Nigeria (LEN), Primary School Enrolment (PSER), Secondary School Enrolment (SSER) and Tertiary Institutions Enrolment (TIER) $\beta \Delta X_{t-1}$ this present the lag (period one) of the variables,

To formulate Error Correction Model (ECM) it will begins with the Ordinary Least Squares (OLS), the Ordinary Least Squares for multiple model is formulated as follows:

$$PCY = \alpha + \beta_1 GEE + \beta_2 GEH + \beta_3 LEN + \beta_4 PSER + \beta_5 SSER + \beta_6 TIER + \varepsilon_t \qquad 3.6$$

From the equation above the Error Correction Model (ECM) is formulated as follows:

$$PCY = \alpha + \beta_1 GEE + \beta_2 GEH + \beta_3 LEN + \beta_5 PSER + \beta_6 SSER + \beta_7 TIER + \beta GEE_{t-1} + \beta GEH_{t-1} + \beta LEN_{t-1} + \beta PSER_{t-1} + \beta SSER_{t-1} + \beta TIER_{t-1} + \beta X_{t-2} + \ldots + \beta X_{t-n} - ECM_{t-1} + \varepsilon_t$$

3.7

The Error Correction Model (ECM) will be used to adjust the estimation until the ECM turned negative. The negative sign of coefficient of the error correction term ECM (-1) shows the statistical significance of the equation in terms of its associated t-value and probability value.

Presentation and Discussion of Results
Descriptive Analysis of Variables

Table 4.2: Summary Statistics

	PCY	GEE	GEH	LEN	PSER	SSER	TIER
Mean	820.0000	73562.04	42828.05	47.68571	18952925	5368523.	734876.4
Median	377.5000	13589.49	9746.400	46.30000	18725820	5578255.	748964.0
Maximum	3203.300	390420.0	231800.0	52.70000	29575790	10884476	1745186.
Minimum	153.1000	155.8100	52.79000	45.50000	11540178	1877057.	57742.00
Std. Dev.	862.4435	111019.7	65062.15	2.261330	5281363.	2427540.	536370.9
Skewness	1.680853	1.731766	1.710018	1.097285	0.401008	0.720054	0.224481
Kurtosis	4.519293	4.849762	4.764783	2.648330	2.027412	2.863765	1.663842
Jarque-Bera	19.84692	22.48411	21.59953	7.203890	2.317517	3.051522	2.897538
Probability	0.000049	0.000013	0.000020	0.027271	0.313876	0.217455	0.234859
Sum	28700.00	2574671.	1498982.	1669.000	6.63E+08	1.88E+08	25720673
Sum Sq. Dev.	25289498	4.19E+11	1.44E+11	173.8629	9.48E+14	2.00E+14	9.78E+12
Observations	35	35	35	35	35	35	35

Source: Author's E-views 7.0 Computation (2015)

The summary of descriptive statistics of relevant variables of study is as reported in table 4.2 above, as may be observed from the table, the mean, median, standard deviation as well as the skewness and kurtosis measures of our variables of interest are given. The mean values of Per Capita Income in Nigeria (PCY), Government Expenditure Education (GEE), Government Expenditure Health (GEH), Life Expectancy in Nigeria (LEN), Primary School Enrolment (PSER), Secondary School Enrolment (SSER) and Tertiary Institutions Enrolment (TIER) are 820.0000, 73562.04, 42828.05, 47.68571, 18952925, 5368523 and 734876.4 respectively. Their respective standard deviations are 862.4435, 111019.7, 65062.15, 2.261330, 5281363, 2427540 and 536370.9. The Jarque-Bera test of normality shows that the error term in our specified equation is normally distributed. This is evidenced by the respective insignificant Jarque-Bera statistics of the relevant variables.

Stationarity Test of Variables
Table 4.3: Augmented Dickey-Fuller and Philips-Perron Test Results

Variables	ADF Statistic	Order	Philips-Perron Test	Order
PCY	-7.539774	(0)2	-5.652097	(0)1
GEE	-5.460092	(0)2	-5.199540	(0)1
GEH	-5.694410	(0)1	-6.949803	(0)1
LEN	-6.214226	(0)2	-11.66499	(0)2
PSER	-8.103736	(0)2	-5.733427	(0)1
SSER	-5.585691	(0)2	-4.966758	(0)1
TIER	-5.956067	(0)1	-6.950550	(0)1
5% Critical Value			5% Critical Value	
(0)1 (2.9558)			(0)1 (-2.927)	
(0)2 (2.9591)			(0)2(-2.955)	

Source: Author's E-views 7.0 Computation (2015)

Pairwise Granger Causality Tests
Table 4.4: Rejection of Null Hypotheses of Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
GEE does not Granger Cause PCY	33	3.72531	0.0368
PCY does not Granger Cause GEE		12.8291	0.0001
GEH does not Granger Cause PCY	33	3.54904	0.0423
LEN does not Granger Cause PCY	33	11.5908	0.0002
PCY does not Granger Cause PSER		4.94912	0.0144
GEH does not Granger Cause GEE	33	4.82141	0.0159
LEN does not Granger Cause GEE	33	7.37124	0.0027
GEE does not Granger Cause TIER		4.86911	0.0153
LEN does not Granger Cause GEH	33	10.9102	0.0003
GEH does not Granger Cause TIER		6.06728	0.0065
PSER does not Granger Cause LEN	33	10.2400	0.0005
TIER does not Granger Cause LEN	33	11.4701	0.0002
PSER does not Granger Cause TIER		5.72046	0.0083

Source: Author's E-views 7.0 Computation (2015)

Table 4.4 above shows Pairwise Granger Causality Tests, from the results all the listed pair of variables have causal relationship among them. That is there is a causal relationship among the variables given the probability values of the variables at 5 percent level of significance. Therefore, the null hypotheses which stated that there are no causal relationships among variables are rejected.

Long Run Regression Results
Table 4.5: Long Run Regression Results

Variables	Coefficient	Std. Error	T- statistic	Prob.
C	84.89142	10.41103	8.153987	0.0000
LOG(GEE)	0.432522	0.146891	2.944514	0.0064
LOG(GEH)	-0.464869	0.133810	-3.474098	0.0017
LOG(LEN)	23.63596	1.886374	12.52984	0.0000
LOG(PSER)	0.742284	0.406981	1.823878	0.0789
LOG(SSER)	-0.622290	0.271439	-2.292556	0.0296
LOG(TIER)	-0.219059	0.136275	-1.607481	0.1192
R-Squared	0.929345			
Adjusted R^2	0.914205			
F-statistic	61.38242			
DW	1.904286			

Author's E-views 7.0 Computation (2015)

The model shows the impact of Government Expenditure on Education (GEE), Government Expenditure on Health (GEH), Life Expectancy in Nigeria (LEN), Primary School Enrolment (PSER), Secondary School Enrolment (SSER) and Tertiary Institutions Enrolment (TIER)on Per Capita Income in Nigeria (PCY) in Nigeria. From the result, the R-square of 93 percent and the adjusted R-square of 91 percent suggest that there is strong and positive relationship between Per Capita Income in Nigeria (PCY) and Government Expenditure on Education (GEE), Government Expenditure on Health (GEH), Life Expectancy in Nigeria (LEN), Primary School Enrolment (PSER), Secondary School Enrolment (SSER), Tertiary Institutions Enrolment (TIER). Given the F-statistic value of 61.38, it shows that the model employed is statistically significant in explaining the variation in Per Capita Income in Nigeria (PCY). This implies that Per Capita Income in Nigeria (PCY) can be improved by increasing Government Expenditure on Education (GEE), Government Expenditure on Health (GEH), Life Expectancy in Nigeria (LEN), Primary School Enrolment (PSER), Secondary School Enrolment (SSER), Tertiary Institutions Enrolment (TIER)in Nigeria if everything being equal. Durbin Watson statistic of 1.9 suggests that the model is free from serial auto correlation.

From the results Government Expenditure on Education (GEE), Life Expectancy in Nigeria (LEN) and Primary School Enrolment (PSER) in Nigeria were positively related to Per Capita Income in Nigeria (PCY) and Government Expenditure on Education (GEE) and Life Expectancy in Nigeria (LEN) were statistically significant at 5 percent level of significance in explaining variation in the in Per Capita Income in Nigeria (PCY). Though the Primary School Enrolment (PSER) in Nigeria was positively related to Per Capita Income in Nigeria (PCY) but it was statistically insignificant at 5 percent level of significance in explaining variation in Per Capita Income in Nigeria (PCY).

On the other hand, Government Expenditure on Health (GEH), Secondary School Enrolment (SSER) and Tertiary Institutions Enrolment (TIER) were is negatively related to Per Capita Income in Nigeria (PCY)in Nigeria and Government Expenditure on Health (GEH), Secondary School Enrolment (SSER) were statistically significant at 5 percent level of significance in explaining variation in Per Capita Income in Nigeria (PCY). This implies a percent change Government Expenditure on Health (GEH), Secondary School Enrolment (SSER) will cause 0.46 and 0.62 percent in Per Capita Income in Nigeria (PCY) respectively. While Tertiary Institutions Enrolment (TIER)was statistically insignificant at 5 percent level of significance in explaining variation in Per Capita Income in Nigeria (PCY).

Error Correction Model Results
Table 4.6: Error Correction Model Results

Variables	Coefficient	Std. Error	T- statistic	Prob.
C	-75.71507	4.250294	-17.81408	0.0000
LOG(GEH)	-0.096146	0.028783	-3.340358	0.0028
LOG(LEN)	20.83016	1.065459	19.55041	0.0000
LOG(TIER)	0.161104	0.063215	2.548496	0.0180
D(LOG(TIER(-1)))	0.531541	0.136500	3.894069	0.0007
D(LOG(GEE(-2)))	0.133153	0.033000	4.034995	0.0005
D(LOG(LEN(-2)))	13.25369	6.192728	2.140201	0.0432
D(LOG(SSER(-2)))	0.732174	0.243988	3.000863	0.0064
ECM(-1)	-0.182802	0.134031	-1.363880	0.1858
R-Squared	0.984682			
Adjusted R^2	0.979354			
F-statistic	184.8104			
DW	1.964945			

Author's E-views 7.0 Computation (2015)

The Error Correction Model in Table 4.6 show that the coefficient determination (R^2) is 0.98, which indicates that about 98 per cent of the systematic variation in the Per Capita Income (PCY) growth rate is accounted for by the variables taken together. The F-value of 184.8 is significant at 1 per cent level of significance, which further suggests a linear relationship between the regressor and regressand. That is there is a strong relationship between Per Capita Income in Nigeria (PCY) and Government Expenditure on Education (GEE), Government Expenditure on Health (GEH), Life Expectancy in Nigeria (LEN), Primary School Enrolment (PSER), Secondary School Enrolment (SSER) and Tertiary Institutions Enrolment (TIER). While the D.W. statistics of 1.60 rules out auto-correlation.

From the result, the Life Expectancy in Nigeria (LEN), Tertiary Institutions Enrolment (TIER), Tertiary Institutions Enrolment (TIER) at lag one, Government Expenditure on Education (GEE) at lag two, Life Expectancy in Nigeria (LEN) at lag two and Secondary School Enrolment (SSER) at lag twowere found to be positively related to Per Capita Income in Nigeria (PCY) and all the variables were statistically significant in explaining any variation in the Per Capita Income in Nigeria (PCY) in the short-run. This implies that any change in Life Expectancy in Nigeria (LEN), Tertiary Institutions Enrolment (TIER), Tertiary Institutions Enrolment (TIER) at lag one, Government Expenditure on

Education (GEE) at lag two, Life Expectancy in Nigeria (LEN) at lag two and Secondary School Enrolment (SSER) at lag two will cause 20.8, 0.16, 0.53, 0.13, 13.3 and 0.73 percent change in the Per Capita Income in Nigeria (PCY) respectively. While Government Expenditure on Health (GEH) was negatively related to Per Capita Income in Nigeria (PCY) and statistically significant inin explaining any variation in the Per Capita Income in Nigeria (PCY) in the short-run.

Also, from the result the coefficient of the Error Correction Term is -0.1828 which implies that the speed of adjustment is approximately 0.18 per cent per quarter. The negative sign and significant coefficient is an indication that co-integrating relationship exists among the variables that are Per Capita Income in Nigeria (PCY) and the independent variables. The size of the coefficient on the Error Correction Term (ECT) denotes that 0.18 per cent of the disequilibrium caused previous year's shock converges back to the long run equilibrium in the current year. This implies that in the short-run the Life Expectancy in Nigeria (LEN), Tertiary Institutions Enrolment (TIER), Tertiary Institutions Enrolment (TIER) at lag one, Government Expenditure on Education (GEE) at lag two, Life Expectancy in Nigeria (LEN) at lag two and Secondary School Enrolment (SSER) at lag two can be used to achieve economic growth in Nigeria.

Conclusion and Recommendations
In conclusion, both the long-run and short-run model shows that there is strong relationship between Per Capita Income and Human Capital Development in Nigeria. From the result education variables seem to have significant impact on Per Capita Income than the health variables except the Life Expectancy in Nigeria which has positive and significant impact on Per Capita Income both at long-run and short-run. The negative relationship between Per Capita Income and Government Expenditure on Health the poor performance of health sector in improving the level of Per Capita Income both in long-run and short-run. Similarly our education sub-sectors specifically Secondary School Enrolment (SSER) and Tertiary Institutions Enrolment (TIER) has not lived up to expectation, the empirical results show the poor performance of Tertiary Institutions Enrolment (TIER) in long run. The performance in Secondary School Enrolment (SSER) and Tertiary Institutions Enrolment (TIER) may be due to incessant strikes and disruption of academic activities, leading to shorter academic calendar, poor facilities such as ill-equipped libraries, laboratories, lack of teaching and research materials and inadequate classrooms. Therefore, the paper recommends the following:

i.   Government should ensure rapid progress in quality education and health delivery as a means of human capital development. The issues of incessant strikes and disruption of academic activities, leading to shorter academic calendar, poor facilities such as ill-equipped libraries, laboratories, lack of teaching and research materials, inadequate classrooms should be handled with seriousness at all levels of educational system in Nigeria.

ii.   The government should also increase its spending on health and economic infrastructure in order to enhance the efficiency of labour and increase productivity.

iii.   The education and health policies should be viewed and redesigned to meet the current education and health needs for sustainable high standard of living and improved Per Capita Income in Nigeria.

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Appendix I
Table 4.1: Data for Regression

Year	PCY	GEE	GEH	LEN	PSER	SSER	TIER
1980	871.1	155.81	52.79	45.5	12,206,291.0	1,877,057.0	57,742.0
1981	806.5	165.43	84.46	45.9	14,026,819.0	2,473,673.0	74,607.0
1982	661.2	187.93	95.95	46.1	14,964,143.0	2,880,280.0	87,066.0
1983	444.6	162.15	82.79	46.2	15,308,384.0	3,334,644.0	104,683.0
1984	348.5	198.90	101.55	46.3	14,383,487.0	3,402,665.0	116,822.0
1985	344.1	258.60	258.60	46.3	13,025,287.0	2,995,578.0	126,285.0
1986	240.6	262.71	262.71	46.3	12,914,870.0	3,094,349.0	135,783.0
1987	272.5	225.01	225.01	46.3	11,540,178.0	2,934,349.0	150,613.0
1988	256.4	1458.80	1458.80	46.2	12,690,798.0	2,997,464.0	219,199.0
1989	260.0	3011.80	3011.80	46.1	12,721,087.0	2,723,791.0	307,702.0
1990	321.7	2482.80	2402.80	46.1	13,607,249.0	2,901,993.0	326,557.0
1991	279.3	1256.30	1256.30	46.1	13,776,854.0	3,123,277.0	368,897.0
1992	291.3	291.30	291.30	46.1	14,805,937.0	3,600,620.0	376,122.0
1993	153.1	8882.38	8882.38	46.1	15,911,888.0	4,150,917.0	383,488.0
1994	171.0	7382.74	7382.7	46.1	16,683,560.0	4,500,000.0	202,534.7
1995	263.3	9746.40	9746.4	46.1	17,994,082.0	5,084,546.0	391,035.0
1996	314.7	11496.15	11496.1	46.2	19,794,082.0	5,389,619.0	689,619.0
1997	314.7	14853.54	3891.1	46.2	21,161,852.0	5,578,255.0	862,023.0
1998	273.9	13589.49	4742.2	46.3	22,473,886.0	5,795,807.0	941,329.0
1999	299.4	43610.65	16638.7	46.4	23,709,949.0	6,056,618.0	983,689.0
2000	377.5	57956.64	15218.0	46.6	24,895,446.0	6,359,449.0	1,032,873.0
2001	350.3	39882.60	24522.2	46.9	27,384,991.0	6,995,394.0	1,136,160.0
2002	457.4	80530.88	40621.4	47.2	29,575,790.0	7,485,072.0	1,249,776.0
2003	510.3	64782.15	33267.9	47.6	26,292,370.0	7,091,376.0	1,274,772.0
2004	645.8	76524.65	34197.1	48.1	28,144,967.0	7,091,376.0	1,745,186.0
2005	804.0	82795.06	55661.6	48.7	28,234,865.0	6,084,654.0	1,432,357.0
2006	1014.7	87294.56	58686.5	49.8	22,861,884.0	5,637,783.0	1,378,653.0
2007	1131.1	107529.39	72290.0	49.8	21,632,070.0	6,009,869.0	1,677,554.0
2008	1376.9	164000.0	98200.0	50.3	21,294,517.0	6,272,601.0	1,224,654.0
2009	1092.0	137156.6	90202.6	50.8	20,080,976.0	6,362,243.0	1,162,629.0
2010	2315.0	170800.0	99100.0	51.3	23,663,805.0	6,102,629.0	1,194,175.0
2011	2514.1	335800.0	231800.0	51.7	19,262,033.0	9,540,294.0	1,530,959.0
2012	2739.9	348400.0	197900.0	52.1	18,667,308.0	10,208,631.0	850,640.0
2013	2979.8	390420.0	179990.0	52.5	18,725,820.0	10,876,967.0	748,964.0
2014	3,203.3	311120.0	194960.0	52.7	18,934,842.0	10,884,476.0	1,175,525.0

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