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Human Capital Development Income Inequality and Economic Growth

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Abstract:
This paper examined the relationship among human capital development, income inequality and economic growth in Nigeria and how human capital development transmit shocks to economic growth using government expenditures on education and health and secondary school enrolment as proxies for human capital development and Gini coefficient as proxy for income inequality over the period of 1980-2016. Data for the study were sourced from the World Development Indicators (WDI). The Auto Regressive Distributed Lag (ARDL) and Vector Auto Regression(VAR) were used as the estimation techniques .The results from the ARDL showed that ,there exist a long and short term co-movement among human capital development, income inequality and economic growth during the period under review .Also the result from the VAR revealed a standard deviation shock from income inequality exerted a negative and significant impact on secondary school enrolment while other variables like government expenditure on education and government expenditure health exerted a positive and significant impact. Thus, in order to reduce income inequality and increase economic opportunities to all citizens, Nigeria government and policy makers need to allocate adequate resources in developing human capital as this will enhance economic growth in the country.

Keywords: *Human capital development, income inequality, economic growth*

1. Introduction

The quality of human capital in an economy is a good indication of the level of development. This assertion flows from the link between human capital development and rate of expansion of output per worker (Solow,1956).The idea that quality and effective human capital drives economic growth has been established both theoretical and empirically (Romer,1986;1990:Lucas 1988;Barro,1991).In the same vein, how national income is distributed among different classes of the economy also matters for economic growth. This has been well discussed in the literatures on inequality and economic growth (Kuznet,1970).

It has been established also that among the causal factors responsible for the impressive performance of the economy of both developed and newly industrialized countries is a strong commitment to human capital development (World Bank 1995:Barro 1991.This shows therefore that human capital matters for economic growth just as low income inequality does for inclusive economic growth (AFDB,2016). For example, Patrinos (2016) asserted that human capital accounts for 62% of total global wealth and showed that some nations spend an average of 5% of Gross Domestic Product (GDP) and average of 20% of national budget on education and that investment is highly yielding. According to the study, every additional year of education increases earnings by 10% confirming the causal relationship between improvement in human capital and income.

Human capital theory suggests that productivity is based largely on workers knowledge and skills which are the result of investment process in human capital(Becker 1962).As more productive workers will be rewarded with higher wages, education thus is a key determinant of social mobility and a major factor determining the distribution of incompetence. The internationally accepted instrument for measuring the degree or progress which humanity has achieved across the nations of the world is the Human Development Index (HDI).The scale usually uses three principal parameters to identify the human development of a nation. . These are quality of education, quality of health and standard of living and every country in the world has been ranked globally according to its performance using these metrics. For example, Nigeria ranked 152 in HDI out of 188 countries assessed by UNDP in 2017 .Nigeria ranked below Ethiopia (142), Gabon (109), Ghana (139) and Equatorial Guinea (135). In quality of life, Nigeria was in number 156 out of 187 nations assessed by UNESCO for 2017. Investing in education and health enhances higher productivity and will allows individual to earn more wages thereby bringing an increment in his income. Higher income enhances better standard of living through access to good food, good health, quality education and clean environment. The significance and relevance of human capital development in the achievement of meaningful and sustainable economic growth is very important in any nation. In the absence of substantial investment in the development of human capital in a country, sustained economic growth would only be a mere wish and never a reality.

The economic performance of most African countries has been poor over a long period with the region having the worst growth indices globally(Collier,2007).This has been attributed to many reason ranging from reliance on commonly export to poor policy choices.(Collier and Bates, 2007). Nigeria represents a prime example of this poor economic

performance. The growth rates of per capita income in Nigeria have fluctuated over the last four decades contracting at an annual rate of 2.7% from 1980-2000 and expanding at an annual rate of 1.32% from 2003-2017(World Development Index ,2016) At the same time, human development index for Nigeria has been very low at 0.532 while income inequality has been high at 28.2.(UNDP) However, using the growth rates of GDP starting from the year 2000, Nigeria has maintained an impressive growth over the past decade with a record annual growth rate of above 6 % in Real Gross Domestic Product (GDP) from 2003 to 2014. This growth rate is higher than the West African sub regional level and far higher than the sub-Saharan Africa level (African Economic Outlook (AEO) 2014). Despite the sustainable economic growth rate in Nigeria from 2000 to 2014, there was no reduction in the value of income or improve human capital development index, for example, both indices have shown that the expansion of the economy during this period has not resulted into inclusive growth. Poverty ratio remains high at about 70% while income inequality is at 28.2% (AEO, 2017). The fact that an economy grows rapidly without reducing poverty rate and inequality needs to be analyzed extensively. Also, the human capital index in Nigeria is very poor with 59.6 literacy rate (Human Development Indices and Indicators, 2018) and 13.2million Nigerian children are out of school (UNICEF, 2018). There is the need therefore to understand how the poor economic performance in Nigeria can be explained using its metrics in both human capital investment and reduction in income inequality.

This study therefore examined the impact of human capital development, and income inequality on economic growth in Nigeria and also examine if the impact of Nigeria government in financing education and health sectors, skills, training and other related factors whether it has been able to reduce income inequality and increase economic growth. This is because human capital development is key to the achievement of sustainable and inclusive economic development. This is the research gap that the present study intends to fill.

The reminder of this paper is structured as follows. The introductory section is followed by review of literature in section two. Section three discusses the methodology, while section four presents the empirical results. Section five concludes and makes recommendations.

2. Literature Review

2.1. Empirical Review

Human capital development can be referred to as continuous process of acquiring knowledge, competencies, values, social and personal attributes that are represented in the ability to perform labour so as to produce economic value.(Rastogi,2002) In other words, it can be defined as a measure of the economic value of an employee's skill set. Some of this is acquired through investment in education and improvement in health. The amount of investment a person places in education and being healthy will have an impact on the income that the person receives after his education.

Given the importance of human capital development, income inequality and how it can influence economic growth, numerous studies have been conducted on impact of human capital development on economic growth neglecting the implication of income inequality. Several studies have explored the relationship between human capital development index and economic growth in different region of the world. For instance, Mankiw, Romer and Weil, (1992) examine whether the Solow growth model is consistent with the international variation in the standard of living and the percentage of population in secondary school. It showed that an augmented Solow model that include accumulation of human as well as physical capital provides an excellent description of the cross-country data.

Studies carried out in Nigeria used Johansen integration and Ordinary Least Squares (OLS) method to estimate the impact of human capital development on economic growth. For example,Ogunleye,Owolabi, Sanyaolu, and Lawal, (2017), studied the extent to which human capital development impacts on the economic growth of Nigeria between the period of 1981 – 2015. The study established that human capital development has significant impact on economic growth. Eigbiremolen and Anaduaka (2014) investigated the impact of human capital development on national output from 1999-2012, using quarterly time series data and auto regressive distributed lag. The study showed a positive and significant impact of human capital on output level. Mba, Mba, Ogbuabor and Ikpegbu (2013) examined the relevance of human capital development on the growth of the economy using the Ordinary Least Squares (OLS) technique. And found that there is a strong positive relationship between human capital development and economic growth and recommended the revisiting the man-power needs of the various sector of the economy.

Adamu (2003) determined the impact of human capital formation on economic growth in Nigeria between 1970 and 2000 using Cointegration and Error Correction Mechanisms (ECM). The result indicated that investment in human capital in form of education and training can lead to economic growth because of its impact on labour productivity. Gerhard and Ravikumar (1999), study human capital accumulation and endogenous public expenditures between the period of 1965-1995, using overlapping generations model with heterogeneous agents in which human capital investment through formal schooling is the engine of growth they find out that income inequality declines more quickly under public education. On the other hand, private education yields greater per capita incomes unless the initial income inequality is sufficiently high. The study concluded that endogenize is the choice of education regime, if majority of agents have income below average, then the vote is in favor of public education.

2.2. Theoretical Review

This study has its theoretical foundations on two theories of economic growth. The first is the endogenous growth theory as propounded by Romer (1986) and Lucas (1988). This growth model which is an improvement on the Solow Model (1956) relaxed the assumption of diminishing return to output capital ratio and showed the output per worker can

expand indefinitely if those workers engage in learning by doing. In this sense therefore, technological progress is endogenous to the growth process. This is contrary to the Solow model where technological progress occur outside the model. In the original Solow model government policies on health, education, infrastructural development and expenditures on Research and Development (R&D) do not matter for long-run expansion in per capita income. This is not the case with the endogenous growth model, where investments in education, health and other social and physical infrastructures drive sustained expansion in output per worker. However, there has been some extensions to the Solow growth models where its augumented version have incorporates human capital development (Barro. 2000: Markiw, Romer and Weil, 1992)

The second is the Kuznet hypothesis which describes the relationship between economic growth and inequality (Kuznet, 1970). This hypothesis states that inequality tends to increase at the early stage of economic growth because of the need by the economy to adapt to structural dynamics as the economy moves from one stage to another. This hypothesis is based on how an economy transit from traditional sector dominated economy to modern sector dominated economy. For example, as an economy transform itself from agricultural based to industrial based, the time lag it takes to allocate resources efficiently between these two sectors has the tendency to expand inequality at first and as the economy matures and become more efficient inequality reduced.

3. Methodology

3.1. Model Specification

This study specified two models based on its objectives. The first model investigate the impact of human capital development and income inequality on economic growth in Nigeria, while the second model investigate human capital development and inequality transmit shocks to economic in Nigeria. Generally, specification of economic model is based on theoretical framework and on the available data relating to the human capital development, income inequality on economic growth being studied. The study has employed and modified the model formulated in the works of Lucas (1988), Mankiw et al (1992), Gemmell (1996) and Ncube (1999).

Model 1: To investigate the impact of human capital development, and income inequality on economic growth in Nigeria

The formulation below was employed by these scholars; the equation of the model is built thus;

…… ... (1)

Specifically, the model with the expected notation is specified thus in log form:

…… …….. (*2*)

$RGDP_t$ = Real Gross Domestic Product
ING_t = Income Gini Coefficient
SSE_t = Secondary School Enrollment
GEE_t = Government Expenditure on Education
GEH_t = Government Expenditure on Health
= Coefficients to be estimated in the model
α_0 = the intercept of the model
t = time
μ_t = Stochastic error term

Model 2: To examine the effect of transmission mechanism shock of human capital development and income inequality on economic growth in Nigeria.

The model is specified below;

…….. (*3*)

For this study, Gross Domestic Product (RGDP) is adopted as proxy for income and it is measured at the level, Gini Coefficient represents income inequality, which secondary school enrollment (SSE), government expenditures on education (GEE), government expenditure on health (GEH) are used to measure human capital development

3.2. Estimation Techniques

3.2.1. Unit Root Test

The variables of this study are subjected to non- stationary test using the Augumented Dickey Fuller (ADF) testing procedures. the unit root test regression equation equations with constants are; unit root test is the preliminary step for the empirical analysis in economics, basically in the co-integration test. The results are achieved assuming the presence of unit root and no unit root (stationary variable) in research question

3.2.2. Co- Intregation

After the unit root test, it is known that all variable are either 1(0) 1(1), the co-integration test under ARDL approach to co-integrations based on SBC model have been made. the long-run relationship test based on the F statistics test is made confirm the appropriateness of the ARDL approach to co-integrations .Here, hypothesis is λ1=λ2=λ3=0,which shows the non- existence of long-run relationship, which is decided following Pesaran and Pesaran (1997) i.e if F statistics

test is significant based on the F-table given in, it shows the existence of long-run relationship, only the variables with long-run relationship are tested for ARDL approach to co-integration for selected equation. A simple model as mentioned in equation 2 has been developed to explain the ARDL approach to co-integration.

Yt= …….. (4)

Where, Yt, Xt and Zt are three different time series, e t is the vector of error term, and a, b and y are parameters.

The error correction version of this model is presented in equation (*vi*) below which shows the non-existence of long–run relationship

+++ …… (*5*)

3.2.3. Vector Autoregressive (VAR)

The VAR approach that this study utilizes to examine the effect of transmission mechanism shock of human capital development and income inequality on economic growth allows interaction between all the variables. The variables included in the VAR are Real Gross Domestic Product(GDP),Income Gini co-efficient(ING) Secondary School Enrollment(SSE), Government Expenditure on Education (GEE) Government Expenditure on Health(GEH).The VAR model takes each of the variables in the system and relates its variation to its own past history and the past values of all the other variables in the system. A typical VAR model in standard form can be written as;

…….. (*6)*

Where Yt denotes the (5x1) vector of the six endogenous variables given by

Yt = [GDPt, INGt, SSEt, GEEt GEHt.]'c, is a(5x1) vector of intercept terms, Ai is the matrix of autogressive coefficient of order i, and the vector of random disturbances]'contains the reduced- form ordinary least squares residuals.

The lag length of the endogenous variable p, will be determined by using the information criteria

By imposing a set of restrictions, it is possible to identify orthogonal shocks, n, for each of the variables in (*vii*) and to compute this orthogonal innovation through the random disturbances;

…….. (*7)*

The estimation of (*viii*) allows cov() to be determined. Therefore, with the orthogonal restrictions and by means of an adequate normalization

Cov(Ƞ)=I

where I(5x5) Identity matrix, therefore;

Cov()= Cov()=B Cov() ……..(*8)*

I= B Cov() ……(*9)*

Since B is a square (nxn) matrix, which has five dimensions, B then has 25 parameters that need to be identified. By imposing orthogonality, from(*x*) only 15 parameters can be determined.

For the complete identification of the model, 10 more restrictions are needed. The use of a Choleski decomposition of the matrix of covariances of the residuals, which requires all elements above the principal diagonal to be zero, provides the necessary additional 10 restrictions, and the system is then exactly identified.

A lower triangular structure to is then imposed,

…….. *(10)*

The residuals et are written as a function of the orthogonal shocks in each of the variables which gives;

…….. (*11)*

The basic identification scheme uses a VAR model in which the ordering of the variables is [GDP, ING, SSE, GEE, GEH], where the contemporaneously exogenous variables are ordered first. The variable in the VAR is thus ordered from the most exogenous to the least exogenous one.

3.2.4. Impulse Response Functions (IRF)

One of the objectives of this study is to examine the relationship among human capital development, income inequality on economic growth in Nigeria. Thus, the IRF is the most appropriate tool to use for such purpose. Through the use of IRF, it can be observed that the effect and statistical significance of each variable's response to one standard deviation increase in growth outcome could be determined.

The IRF is given as;

Δ +

Where

: I(1) Endogenous variables

Matrix with coefficients associated to lag i

α: Vectors with coefficients associated to the intercepts

Vector with innovations.

Variance Decomposition Analysis

The relative importance of human capital development and income inequality on economic growth shocks in the VAR system can be traced by using the variance decomposition analysis. It shows the percentage of change in a specific

variable in connection with its own shock against the shocks to the remaining variables in the system. The higher the share of explanation of error variance, the more important the variable compared to other variables in the system.

4. Results and Discussions

4.1. Descriptive Statistics

Variables	Mean	Std.Dev.	Skewness	Kurtosis	Jarque-bera	Prob.
GEE	90.51948	125.4985	1.317377	3.275119	10.81883	0.0044
GEH	52.47321	77.38635	1.426043	3.659441	13.21094	0.00135
ING	36.63127	17.51471	1.707371	4.680742	22.33160	0.000014
RGDPgr	3.542640	7.506881	1.229810	8.924161	63.43250	0.00000
SSE	31.40857	10.99628	0.996366	3.065865	16.128623	0.00046

Table 1: Descriptive Statistics
Source: Author's Computation (2020)

The descriptive statistics of the variables are presented in Table 1. Above. The results of the estimated mean value which is used to examine the nature of the data distribution, have the highest mean value of (90.51948) for Government Expenditure on Education(GEE),while Economic Growth (RGDPgr) showed the lowest mean value of(3.542640).standard deviation in its own case equally showed that Economic Growth (RGDPgr) (7.506881) has low standard deviation value. The implication of this is that Economic Growth (RGDPgr) has a very low variability in the study. But this is quite different for other variables such as Government Expenditure on Education (GEE) (125.4985), Government Expenditure on Health (GEH) (77.3863) Income Inequality (ING) (17.51471) and Secondary School Enrollment (SSE) (10.99628) as they showed high variability in the study given their standard deviation values.

The result in table 1 also showed that all the variables of interest are positively skewed. The estimated values of kurtosis for all the variables 0f interest are greater than 3,which indicate that the distributions of these variables are thick and therefore imply the presence of heterogeneity issues in their data. The Jarque-bera value for all the variables passes the significance test at the 1% level. This implies that the series are not normally distributed. The results of the descriptive statistics therefore justified the use of Autoregressive Distributed Lag test (ARDL) to estimate the relationships among the variables in this study, following from the presence of heterogeneity in the data series in the study.

4.2. Result of the Unit Root Test.

This section examines the time series properties of the variables in other to understand the individual nature of the variables and to ascertain there suitability for the estimation techniques adopted for this study. This is done by carrying out a Unit Root Test on each variable. This process is also known as determination of stationarity of the variables. According to Engle and Granger (1957) a variable is stationary when it has no unit root. This is necessary to know how sensitive is each variable to shocks or disturbance over time. A non-stationary variable is the one in which a shock is recommended for long or sustained over time. While a stationary variable may not have its sustained for long. In literature, most economics time series are non- stationary and including non-stationary variables in the model can lead to spurious regression coefficient estimate. Therefore, in order to avoid the problem of spurious regression, this study employed Philip- Perron unit root test to examine the stationary of the variables.

Variables	T-statistics	P-Value	Order of Integration
GEE	-5.300605	-3.632900***	I(1)
GEH	-7.381194	-3.632900***	I(1)
ING	-3.072566	-2.948404**	I(1)
RGDPgr	-4.545586	-3.626784***	I(0)
SSE	-4.604955	-3.632900***	I(1)

Table 2: Philip-Perron Unit Root Test Results
*Note: *,**,*** Represent 10%,5% and 1% level of Significance Respectively*

Table 2 showed the result of the Philip –Perron Unit root test for this study. The result revealed that only Economic Growth (RGDPgr) attained its stationarity at level I(0). All other variables such as Government Expenditure on Education (GEE), Government Expenditure on Health (GEH,) Income inequality (ING), Secondary School Enrollment (SSE), attained their own stationarities after the first difference i.e difference of I(1). This indicates that any shock or disturbance to these variables will not be sustained for a long period of time. Because of a combined order of integrations i.e I(0) and I(1) for these variables, the method of Autoregressive Distributed Lag model (ARDL) is suitably adopted and its bound test is used to examine the presence of co-integrations among the variables. This study therefore proceeds to Autoregressive Distributed Lag (ARDL) Bound Test to long-run relationship.

4.3. Result of Co-Integration Test

T –statistics	Value	K
F-statistics	4.262367	6
Critical Value Bounds.		
Level of significance	I(0)	I(1)
10%	1.88	2.99
5%	2.14	3.3
2.5%	2.37	3.6
1%	2.65	3.97

Table 3: Pesaran Autoregressive Distributed Lag (ARDL) Bound Cointegration Test Results

Table 3 reports the results of Autoregressive Distributed Lag (ARDL) Bound co-integration test for this study. From the result, it is revealed that the computed F-statistics value of 4.262367 is greater than the upper bound values at any level of significance. The study therefore rejected the null hypothesis and accepted that there are long-run relationships among the variables during the period under review.

4.4. Long and Short Run Estimation Regression Results

As a result of the existence of long-run relationship among the variables, the study proceeded to estimate the long and short run regression

Table 4 of Autoregressive Distributed Lag (ARDL) Co-integrating and Long-Run form Results

Variable	Short –Run Model			
RGDPgr	Coefficient	Std Error	t-statistics	Probability
D(GEE)	0.86631	0.043724	1.981319	0.0257
D(GEH)	0.37868	0.075802	1.499564	0.0282
D(ING)	-1.71497	1.621595	-3.27942	0.0083
D(SSE)	-1.69989	1.571254	-2.22518	0.0086
ECM	-2.72595	0.363743	-7.49417	0
	Long-Run Model			
GEE	0.3178	0.015922	1.995989	0.0239
GEH	0.52291	0,044965	1.762935	0.0219
ING	-0.96958	0.794025	-1.12211	0.0052
SSE	-0.44935	0.218656	-2.05507	0.0369

Table 4: Autoregressive Distributed Lag (ARDL) Co-integrating and Long-Run form Results

R-squared=0.877026, prob(F-statistic)=0.0038224
DURBIN-Watson stat. =1.128378

Table 4.4 reports the Autoregressive Distributed Lag (ARDL) Cointegrating and Long-Run regression results. The results are divided into two segments, i.e, the short and long-run model. The first segment showed the variables in there differenced forms and thus implies short –run relationships, while the second segment exhibited the variables in there non- difference forms indicating the long-run relationships. Result from the short-run model revealed that all the explanatory variables (i.e GEE, GEH, ING and SSE) have significant relationships with the RGDPgr. Government Expenditure on Education (GEE) and Government Expenditure on Health (GEH) have positive and significant impacts on Economic Growth (RGDPgr) while Income inequality (ING)and Secondary School Enrollment (SSE) have negative and significant impacts on Economic Growth (RGDPgr).

In the case of long-run model, its own results equally showed that all explanatory variables have significant relationship with the Economic Growth (RGDPgr). And all the explanatory variables still maintain their respective positive and negative impacts as they were in the short-run model.

The error correction term meets the required condition in which the coefficient is negative (-2.725947) and the p-value (0.0000) is less than 5% level of significance. The coefficient implied that Error Correction Model (ECM) Is capable of correcting any deviations of the short-run dynamics to its long-run equilibrium. The computed coefficient of multiple determination (R^2) value of 0.877026 indicated that the model in this research work satisfied the requirement for goodness of fit. The computed statistics showed that 87% of the total variation in Economic Growth (RGDPgr) is accounted for, by all the explanatory variables while 13% of the changes in the Economic Growth (RGDPgr) are attributed to the control of other factors not included in the model. The F-statistics P-VALUE OF 0.0038224 which is less than exhibited that the influence of all explanatory variables on Economic Growth (RGDPgr) is statistically significant. This indicates that all independent variables have a joint control on the Economic Growth (RGDPgr). The Durbin –Watson has the value of 1.128378 which implied the absence of auto-correlation among the residuals.

4.5. Vector Autoregressive Results

Considering the findings from the Autoregressive Distributed Lag (ARDL) co-integrating results in which the explanatory variables also have significant impacts in the short-run on the Economic Growth (RGDPgr) .It is therefore necessary to explore an alternative short-term estimation techniques that can develop more robustly on the short-run relationship between the explanatory variables and Economic Growth (RGDPgr).In addition, for the purpose of achieving the objective three in this study, Vector Autoregressive (VAR) impulse response functions are equally conducted on our model.

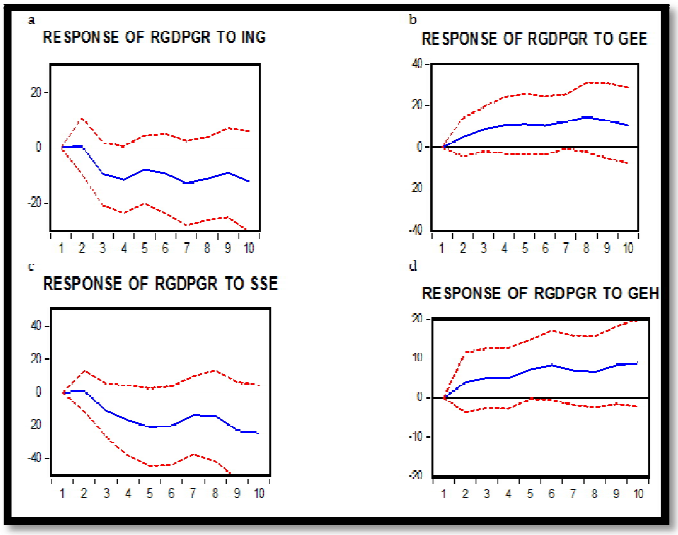

Figure 1: Response of Economic Growth (RGDPgr) to Income Inequality(ING) and Human Capital Development

Figure 1a displayed the impulse response of Economic Growth (RGDPgr) to a standard deviation of Income Inequality (ING). From the result, a standard deviation shock from Income Inequality (ING) produced negative and significant effects on Economic Growth (RGDPgr) in Nigeria. On the contrary, the response of Economic Growth (RGDPgr) to the shock from Government Expenditure on Education is positive and significant in figure 4.2b.Just like the result from figure 4.2a, result from figure 4.2c revealed that a standard deviation shock from Secondary School Enrollment (SSE) exerted negative and significant impacts on Economic Growth (RGDPgr) .

Lastly, the response of Economic Growth (RGDPgr) to a standard deviation shock from Government Expenditure on Education (GEE) is positive and significant in figure 4.2d

Figure 2: Response of Secondary School Enrollment (SSE) to Income Inequality (ING), Economic Growth (RGDPgr), Government Expenditure on Health (GEH) and Government Expenditure on Education (GEE).

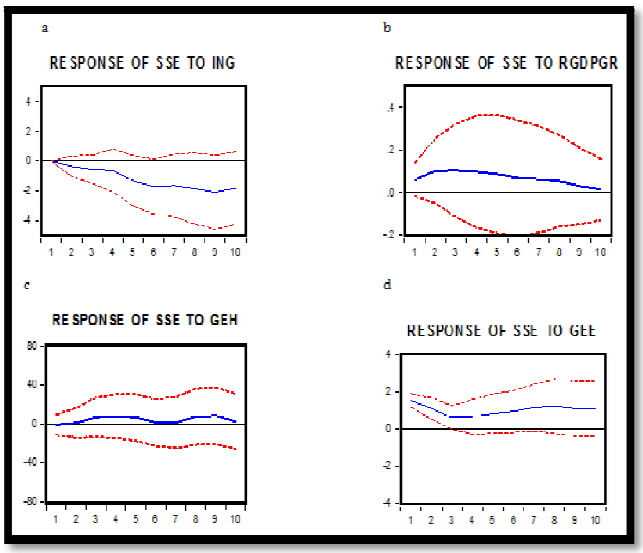

Figure 2: Depicted the Response of Secondary School Enrollment (SSE) to Income Inequality(ING).

Result from the figure confirmed that the response of Secondary School Enrollment (SSE) to a standard deviation shock from Income Inequality(ING) is negative and significant. However, a critical look at the results from figure 4.3b, 4.3c and 4.3d showed that the responses of Secondary School Enrollment (SSE) to standard deviation shock from Economic Growth (RGDPgr), Government Expenditure on Health (GEH) and Government Expenditure on Education (GEE) are positive. But

the patterns of movement in their graphical plots are quite different. The response of Secondary School Enrollment (SSE) to the shock from Economic Growth (RGDPgr) was positive and significant initially, but later diverged towards equilibrium at 8th period. While a standard deviation shock from Government Expenditure on Education (GEE) exerted positive and significant impacts on Secondary School Enrollment (SSE), the response of Secondary School Enrollment (SSE) to the shock from Government Expenditure on Health (GEH) was only positive but not significant.

Figure 3: Response of Government Expenditure on Education (GEE) and Government Expenditure on Health (GEH) To Income Inequality(ING) and Economic Growth (Rgdpgr)

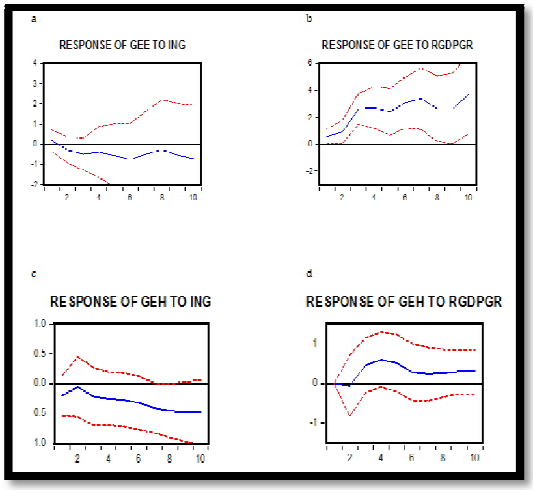

Figure 3: Response of Government Expenditure on Education (GEE) and Government Expenditure on Health (GEH) To Income Inequality(ING) and Economic Growth (Rgdpgr)

Figure 3a and 3b showed the response of Government Expenditure on Education (GEE) to a standard deviation shock from Income Inequality (ING) and Economic Growth (RGDPgr) respectively. Also Figure 3.4c and 4.4d exhibited the responses of Government Expenditure on Health to a standard deviation shocks from Income Inequality (ING) and Economic Growth (RGDPgr) respectively. Results from these figures revealed that a standard deviation shocks from Income Inequality (ING) inflicted negative and significant impacts on both Government Expenditure on Education (GEE) and Government Education on Health (GEH).But the case is quite different for a standard deviation shock from Economic Growth (RGDPgr) as it exerted positive and significant impacts on both Government Expenditure on Education (GEE) and Government Education on Health (GEH) .

Figure 4: Response of Income Inequality to Government Expenditure on Education (GEE) and Government Education on Health(GEH), Secondary School Enrollment(SSE) and Economic Growth (RGDPgr).

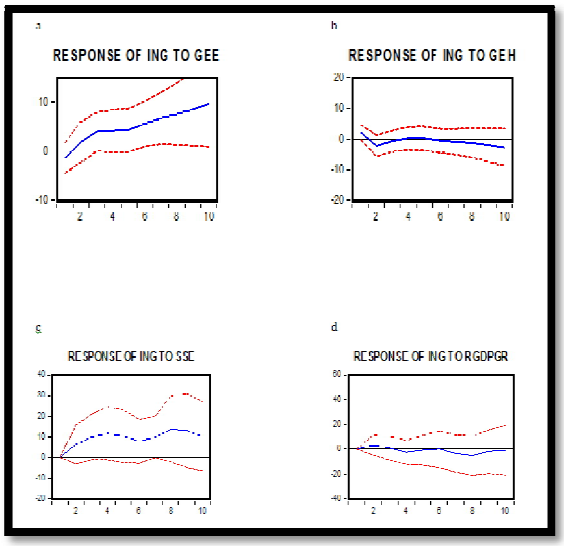

Figure 4: Response of Income Inequality to Government Expenditure on Education (GEE) and Government Education on Health(GEH), Secondary School Enrollment(SSE) and Economic Growth (RGDPgr)

Figure 4a, b, c and d showed the Response of Income Inequality(ING) to a standard deviation shock from Government Expenditure on Education (GEE) and Government Education on Health(GEH), Secondary School Enrollment(SSE) and Economic Growth (RGDPgr) respectively .Results from these figures revealed that a standard deviation shock from both Government Expenditure on Education (GEE) and Secondary School Enrollment(SSE) exerted the same positive and significant effects in Income Inequality(ING).But on the contrary, the response of Income Inequality(ING) to a standard

deviation shocks from both Government Expenditure on Health and Economic Growth (RGDPgr) are insignificant as their graphical plots are unstable and oscillatory over time during the period under review.

4.6. Discussion of Findings

The combined order of integrations [i.e I(0) and I(1)] in the results justified the use of Autoregressive Distributed Lag Model (ARDL) to test for co-integration. Autoregressive Distributed Lag Model (ARDL) results revealed a long-run equilibrium relationship among the variables in the models. The results imply that findings from it can be used to make a long-run policy decisions in Nigeria. Results from the short and long-run segments of Autoregressive Distributed Lag Model (ARDL) cointegration revealed that Income Inequality (ING) has negative and significant impacts on economic growth (RGDPgr) in Nigeria during the period under review. This finding corroborated the results from Vector Autoregressive (VAR) impulse response function in which the standard deviation shock from Income Inequality(ING) had negative and significant impacts on Economic Growth (RGDPgr). This finding is in agreement with the assertions of Brenke and Wagner (2014) that if income inequality is enormous, with a large share of the national income accruing to household with high incomes and a high propensity to save, then a demand- related restraint on growth can arise.

In addition, the result from Autoregressive Distributed Lag Model (ARDL) test showed that Government Expenditure on Education (GEE) and Government Education on Health (GEH) have both short and long-run impacts on the dependent variable and the effect is statistically significant. This finding equally aligned with the results from Vector Autoregressive (VAR) impulse response function in which the response of Economic Growth (RGDPgr) to shocks from both Government Expenditure on Education (GEE) and Government Education on Health (GEH) is positive and significant in Nigeria. This report is consistent with the submission of Colombier and Daguet (2015) that a boost of investment in education and health care leads to a rise in human-capital formation, which then stimulates economic growth. Moreover, the results from Autoregressive Distributed Lag Model (ARDL) test revealed that Secondary School Enrollment (SSE) has negative and significant impacts on Economic Growth (RGDPgr) both in the short and long run in Nigeria. The finding is also consistent with the result from Vector Autoregressive (VAR) impulse response function which confirmed that a standard deviation shock from Secondary School Enrollment (SSE) produced negative and significant impacts on Economic Growth (RGDPgr).This findings might be attributed to high degree of cross-border mobility by young and well-qualified people with Secondary School Education, which consequently threatens the society with brain drain that retard growth.

Another very crucial finding for this research work is from the results of Vector Autoregressive (VAR) impulse response function in figure4.3.findings from the result in this figure revealed that a standard deviation shock from Income Inequality(ING) exerted negative and significant impacts on Secondary School Enrollment (SSE).This finding is an indication that high level of income inequality can impair human capital formation in Nigeria because low-income people do not have sufficient access to Secondary School Education. This findings is in line with submission of (Bernstein,2013).Also, finding from the result of this Figure 3.3 equally revealed that the response of Secondary School Enrollment (SSE) to standard deviation shock from Government Expenditure on Education (GEE) is positive and significant. This finding really implies that better education financed by public expenditure can stimulate the enrolment of children of poor parent into the public secondary school with affordable school fees (Gulfason and Zoega, 2003).

In another dimension, findings from the result in Figure 3.4 exhibited that a standard deviation shock from Income Inequality(ING) exerted negative and significant effect on Government Expenditure on Education (GEE).This finding might be connected with the low rate of returns that characterize investment on education in Nigeria. This report aligns with the assertions of Goldin and Katz (2007) who posited that if the returns on education are decreasing, even in the face of a robust investment on education, there will still be a decrease in wages that are accrued to the workers thereby aggravating the level of income inequality. In addition, result from figure 4.3 equally confirmed that a standard deviation shock from Income Inequality(ING) inflicted negative and significant impacts on Government Expenditure on Health (GEH) in Nigeria. This finding might be attached to the political influence of the high income people who always advocate for a reduction in taxes. A decrease in taxes as sources of revenue to the government will in turn reduces expenditures on health care. This report is in line with the submission of (Bernstein, 2013).

Lastly, findings from the results in figure 4.5 revealed that the responses of Income Inequality(ING) to a standard deviation shock from both Government Expenditure on Education (GEE) and Secondary School Enrolment (SSE) are positive and significant. These findings indicate a significant evidence of wage composition effect in which wage inequality (which eventually leads to income inequality) rises when the educational expansion (through increase in government expenditure on education) bring about an increase in the proportion of more workers. These findings is in agreement with the work of Goldin and Katz(2007) who posited that income inequality tends to increase as the share of population with secondary or tertiary education increases.

The research work used the Pesaran Autoregressive Distributed Lag model (ARDL) Bound cointegrating test to examine the relationship among human capital development, income inequality and economic growth. The result of the Pesaran Autoregressive Distributed Lag (ARDL) cointegration test showed that there is a long term co-movement between human capital development, income inequality and economic growth in Nigeria. Also both the short and long-run model of Auto regressive Distributed Lag Model was confirmed that there is a long-run equilibrium among the variables in the models. Result from the short and long-run segments of Auto regressive Distributed Lag (ARDL) revealed that income inequality has negative and significant impacts on economic growth.

5. Conclusion and Recommendation

Having examined the results and discussion of findings in this research work, it is therefore concluded that there exist a short and long term co-movement between human capital development income inequality and economic growth in Nigeria during the period under review. It is also concluded that high level of income inequality can impair capital formation in Nigeria. The study therefore recommends that government should continue to boost investment in both education and health sector in order to lead to a rise in human capital formation which can stimulate economic growth .Government should find a way of closing the gap between the low income earners and the high income earners so that the low income earners will be able to have access to health care services in order to be more productive in the society.

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