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Human Capital Development and Poverty Reduction in Nigeria

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Abstract

This paper analyzed the link between human capital development and poverty reduction in Nigeria between 1990 and 2016. In specific terms, the effects of primary and secondary schools enrolments, as well as public and private healthcare expenditures on poverty level, were examined. The data required for the analysis were culled from the National Bureau of Statistics and World Bank World Development Indicators. Fully Modified Least Squares and Granger causality test in addition to ADF unit root and Johansen-Juselius cointegration tests were employed as data analysis techniques. It is evident from the unit test result that the variables are mixed integrated with the order of integration ranging from zero to one. The trace and Max-Eigen statistics for cointegration tests indicate that two cointegrating equations exist in the model. The implication of this finding is that underlying measures of human capital development and poverty level have long run relationship. The cointegrating regression result shows that primary school enrolments, secondary school enrolments, and public healthcare expenditure are significantly related to poverty level while private healthcare spending does not exert significant influence on poverty level. A percentage increase in primary school enrolment reduces poverty by 0.697 percent while a percentage increase in secondary school enrolment contracts poverty by 0.84 percent. Similarly, a percentage increase in public healthcare spending, on the average, reduces poverty by 16.63 percent. This is indicative that public sector spending in the health sector is robust in reducing the level and depth of poverty in Nigeria. The Granger causality test results also show that joint causality runs from the explanatory variables to the poverty level. Given this finding, it is recommended among others that Policymakers should ensure that poverty reduction strategy in Nigeria provides for increased access to education through gross primary and secondary school enrolments and public healthcare

Keywords: School Enrolment, Public and Private Healthcare Expenditures, Poverty Reduction

1.1 Introduction

Human capital development has remained at the forefront of strategies for reducing poverty in both low and middle-income countries. This is based on lessons from developed economies where their success, to a great extent, is linked to increased and sustained investment in human resources. Broad-based growth in the forms of social, political and economic transformations is driven by the development of human capital (Harbison and Charles, 1964 as cited in Allahdadi and Aref, 2011). Numerous indicators of human capital development such as quality and improved access to education, healthcare, and nutrition are crucial for alleviating poverty – either

headcount or multidimensional. It is important to note that the quality of education and healthcare delivery have remained at the center of human capital development in low and relatively medium-income countries.

Raja (2000) observed that the centrality of education in human capital development by identifying it as the first step in the process of development. This is because of the dual roles of increasing productivity and reducing poverty education is perceived to play in any economy. Pervez (2014) opined that education provides a roadmap for building human capacity and facilitates sustained growth through knowledge and skills. The importance of education in enhancing human capital is further elaborated by Kim and Terada-Hagiwara (2010) as they claimed that well-educated working population facilitates the adoption of new technology and production methods that are crucial for reducing high trace of poverty.

Like other richly blessed members of the Organization of Petroleum Exporting Countries (OPEC), Nigeria has shown a very high trace of poverty and low human development index. The Human Development Report (UNDP, 2003) indicates that Nigeria is one of the poorest among the poor countries of the world. Again, the UNDP (2008) reveals that Nigeria is ranked 154 out of the 179 countries in terms of human development. It is equally ranked 30th in gender-related development index (Chikelu, 2016). These figures point to the fact that human resource development in Nigeria is quite low and has not improved in recent time. Although successive governments in Nigeria have adopted various strategies and pursued numerous programmes to improve the quality of human resources with a view to reducing the growing levels of poverty, the associated outcomes have not been very impressive considering the growing incidences of poverty in both urban and rural areas. This has provoked several empirical investigations to gain more information on the human resource development-poverty relationship with controversies surrounding the outcomes of the various empirical investigations. In the light of the foregoing, this paper explored the implications of human capital development on poverty reduction drawing an empirical lesson from Nigeria between 1990 and 2016.

1.1 Statement of the Problem

Nigeria is, undoubtedly, one of the most endowed countries in the world in terms of abundant natural and human resources. However, poor human development index and a high trace of poverty have continued to limit the country's potentials in competing effectively in the global economic environment. The National Bureau of Statistics (2005) report indicates that over half of the population lives below the poverty threshold with 35 percent of the population living in extreme poverty while 54 percent of the population is trapped in relative poverty. These high traces of poverty is an indication that Nigeria is performing below expectation in terms of meeting the Sustainable Development Goals (SDGs), especially eliminating poverty by 2030. This has remained a major source of concern to the government and other relevant stakeholders.

Furthermore, governments' commitment to human resource development has not been very impressive. This is evident in the poor funding of human development programmes. It is worrisome that the education sector is grossly underfunded as budgetary allocations to the sector fall short of 26 percent recommended by the United Nations Educational and Scientific Organization (UNESCO). Additionally, the health status of Nigerians has been in a state of devastation in the past two decades. For instance, the CIA World Fact Book (2012) revealed that the average life expectancy in Nigeria stood at 46.76 percent with the male and female life expectancy

averaging 46.76 years and 48.41 years respectively. More so, Nigeria's socio-economic outlook in terms of human development index has been very poor. The UNDP (2008) clearly indicates that Nigeria is far behind her West African counterparts such as Ghana, Senegal, and Cameroun in terms of human development index. This has raised much concern in different quarters regarding the dimensions of human resource index and their relative importance in alleviating poverty. Accordingly, this paper is designed to examine the effectiveness of primary and secondary school enrolments as well as private and public healthcare expenditures in reducing poverty in Nigeria.

2. LITERATURE REVIEW

Several schools of thoughts are of the view that human capital development is vital to poverty reduction. However, some empirical evidence support these claim while others conflicted with it. The literature review in this paper focused on both the theoretical framework and past empirical studies.

2.1 Theoretical Framework

2.1.1 Human capital theory

The development of the human capital theory is originally credited to Becker (1964). The theory emphasized on the skills, knowledge and health status of the population that are important in determining their productivity and welfare. Davis and Sanchez-Martine (2014) opined that a particular aspect of neoclassical economics dwells on individual choices in relation to education, training, and mobility in explaining varying outcomes in the dimensions of human development. Lydall (1968) further explained that variation in the combination of intelligence, environment, and education at the individual tends to account for most of the gaps in personal earnings. The level of human capital acquired by an individual is a direct function of educational attainment. Machin (2009) observed that the under-investment of poor households in many countries in education is a major cause of increasing levels of poverty in these countries. Thus, Davis and Sanchez-Martine (2014) opined that the policy option that emanates from this human-capital-oriented perception of poverty is that the increased spending on the education helps the poor to attain improved earnings potentials.

Scott et al. (2000) identified adult education as an important tool in improving the level of skills acquired by those who do not have the opportunity of benefiting from normal. This is suggesting that people improve their socio-economic status through by investing in their skills and knowledge. In contrast, not investing in skills has been identified by Pemberton et al. (2013) to trigger low earnings and poverty. This tends to reinforce the vicious cycle of development. More so, health status is identified in the human capital theory as a major component of the individuals' stock of human capital and as such influences the likelihood of the incidence of poverty. Poor health status lowers the likelihood of finding work or being able to work at all and hence a higher probability of ending up poor (Reinstadler and Ray, 2010). This is similar to the assertion of Buddelmeyer and Cai (2009) that the participation of individuals with severe in the labor market may make them less likely to possess the abilities required for relatively high paid jobs, thus reducing their marginal productivity.

2.1.2 Keynesian Theory of Poverty

Keynes (1936) proposed this theory following the assumption that underdevelopment in its multidimensional nature causes poverty. Keynesian economists are of the viewpoint that unequal initial endowment in terms of

talent, skills, and capital exist which determines an individual's level of productivity. Jung and Smith (2007) observed that in the view Marshall and Keynes poverty occurs as a result of economic underdevelopment and lack of human capital. Furthermore, the prevalence of poverty in the Keynesian perspective is conceived as the misfortune of certain minorities who are out of work, cannot work or are not expected to work, although they wish to do so. It, therefore, follows that the state needs to intervene by providing some expenditure packages that fine-tune the economy through the stimulation of aggregate demand. High level of human capital such as improved health status and education tend to reduce the incidences of poverty due public sector intervention. This is an indication that, the intervention of the public sector through increased expenditure component in the education and healthcare sectors is imperative for poverty reduction. Notwithstanding the contributions of the Keynesian theory to economic literature, it has experienced some drawbacks for ignoring the common scenario in developing economies in which the multiplier effects of fiscal expansion is located in abroad.

2.2 Conceptualization of Human Capital Development

The concept of human capital development encompasses a conglomerate of investments in such areas as education, health, training, and migration that boost the productivity of an individual in the competition in the labor market. Allahdadi and Aref (2011) opined that human capital relates to the skills and abilities of people, as well as the ability to gain outside resources and bodies of knowledge in order to stimulate understanding and to identify dynamic practices. The accumulation of human capital is crucial to the development process and has long-term effects in the alleviation of poverty. The process of human capital development is complex, dynamic and incremental, and cut across a whole life endeavor. A variety of factors play important roles in the process of human capital development. Prominent among them are health care, education and technological advancements amongst others.

According to Organization for Economic Cooperation and Development (OECD, 1998), human capital defines "the knowledge, skills, competencies and other attributes embodied in individuals that are relevant to economic activity." From the economics point of view, expenditures on education, training, medical care and more are regarded as investments in human capital. This is because people are highly connected to their skills, knowledge, health, or values as their great assets. Sound macroeconomic policy framework enhances better health status, thus, allowing for higher human capital development. Education, training, and healthcare are key components of human capital development. This is supported by both theory and empirical evidence.

2.3 Empirical Literature

Several cross country and country case studies have explored the roles played by human capital development in reducing poverty. The findings from these studies are mixed and varied across various locations and economic blocs. Chikelu (2016) explored the link between human capital development and poverty reduction in Nigerian economy over the period 1986-2012. The Ordinary Least Squares (OLS), Augmented DickeyFuller and Johansen Co-integration methods were utilized in estimating the model with poverty rate as the response variable while primary school enrolment, secondary school enrolment, tertiary school enrolment and per capita income are the predictor variables. The study found evidence of a long run relationship between human capital development and poverty reduction in Nigeria. Hence, the study recommended for improvement in the quality of human capital development in Nigeria.

Allahdadi and Aref (2011) analyzed the role of human resource development in poverty alleviation in rural areas of Marvdasht, Iran. Focus group discussion formed the basis for data collection, and the analysis followed descriptive statistics approach. It was revealed from the empirical analysis that there was a little effort to building a human resource for poverty alleviation. The result also shows evidence of high of education among local people while rural areas are found to face some challenges which hinder their participation in poverty alleviation. The study, however, recommended for a shift in the perception of human capital in knowledge-based economies.

Pervez (2014) assessed the impact of education on poverty reduction in Pakistan using time series annual observations. The Augmented Dickey-Fuller (ADF), causality and Johansen cointegration methodologies were used in testing for the existence of a long run relationship among the series. From the result, it was observed that literacy rate and gross secondary school enrolment have a negative and significant impact on poverty in the long run while life expectancy is positively related to poverty. Therefore, the study suggested that government should focus on the quantity and quality of education that promotes more researchers in the country.

Self and Grabowski (2004) studied the relationship between education and income growth in India. They categorized education into primary, secondary, and tertiary to determine whether education, for each category, has a casual impact on growth. The study further decomposed education variables along gender lines and analysis is carried out to determine whether the casual results vary by gender. The results show that primary education has a robust casual impact on growth than the impact for secondary education. The result also showed that female education at all levels has the potential for generating economic growth while the male has a significant impact on growth only at primary level.

Risikat (2010) investigated the impact of investment in education on economic growth in Nigeria. The study followed the standard growth-accounting model and relied on cointegration and error correction techniques for analyzing the data for each of the variables. The study revealed that investment in the Nigerian educational sector is quite low and fall below the recommendations of the United Nations. It was also found that investment in education has a robust positive relationship with economic growth in Nigeria.

Khan, Iqbal, and Rehman (2016) examined the role of human capital in reducing poverty dilemma in the district Karak Khyber Pakhtunkhwa of Pakistan. The study used primary data, gathered through a comprehensive questionnaire from a randomly selected sample of 150 households at the tehsil level in the sampled district. The logistic regression model was used to explore the variety of human capital factors ranging from the level of education and training programs amongst others. The results showed that education, technical training, and availability of employment opportunities are significant in reducing poverty in the study area. It was further gathered from the results that the incidences of poverty are high in the rural area than urban areas.

Awan, Iqbal, and Waqas (2011) investigated how different levels of education and experience affect urban poverty in the city of Sargodha in Pakistan. The study relied on a survey-based analysis on a sample of 330 households. The poverty status of the household was measured using adjusted official poverty line. It was gathered from the findings that education and experience are negatively related to the poverty status of

individuals. This is an indication that education of the poor is necessary for breaking the vicious circle of poverty. The study, therefore, recommended for collaborative efforts by key stakeholders in investing in education with special focus on primary and middle education with a view to increasing the productivity of the poor through education.

3. METHODOLOGY

3.1 Research Design

In this paper, an ex-facto research design is employed. This choice of this research design was prompted because the data used for the analysis already exist and as such is devoid of any form of manipulation.

3.2 Model Specification

This paper adopts a dynamic cointegrating regression model. The model is anchored on the human capital theory which assumes that education including skills and knowledge as well as health status is important in determining productivity and welfare. The model is patterned after the work of Chikelu (2016) with some improvements following the addition of public and private healthcare expenditure as a share of GDP in the explanatory variables. The functional form of the model is expressed as:

$$PORV = f(TPE, TSE, PUH, PRH) \quad (3.1)$$

Where: PORV = poverty level, TPE = total primary school enrolment, TSE = total secondary school enrolment, PUH = public healthcare spending as a share of GDP and PRH = private healthcare spending as a share of GDP. The econometric representation of the model is provided in a linear form in equation (3.2)

$$PORV_t = \pi_0 + \pi_1 TPE_t + \pi_2 TSE_t + \pi_3 PUH_t + \pi_4 PRH_t + e_t \quad (3.2)$$

Where: PORV, TPE, TSE, PUH and PRH are described in equation (3.1)

π_0 = constant regression estimate, $\pi_1 - \pi_4$ = slope regression estimates and e_t = random error term.

The vector autoregressive (VAR) model for estimating the causal relationship among the series are formalized as:

$$\begin{aligned} \Delta PORV_t = & a_1 + \sum_{i=1}^n d_{11} \Delta PORV_{t-i} + \sum_{i=1}^n d_{12} \Delta TPE_{t-i} + \sum_{i=1}^n d_{13} \Delta TSE_{t-i} + \sum_{i=1}^n d_{14} \Delta PUH_{t-i} + \\ & \sum_{i=1}^n d_{15} \Delta PRH_{t-i} + U_{1t} \end{aligned} \quad (3.3.1)$$

$$\begin{aligned} \Delta TPE_t = & a_1 + \sum_{i=1}^n d_{21} \Delta TPE_{t-i} + \sum_{i=1}^n d_{22} \Delta PORV_{t-i} + \sum_{i=1}^n d_{23} \Delta TSE_{t-i} + \sum_{i=1}^n d_{24} \Delta PUH_{t-i} + \\ & \sum_{i=1}^n d_{25} \Delta PRH_{t-i} + U_{2t} \end{aligned} \quad (3.3.2)$$

$$\Delta TSE_t = a_1 + \sum_{i=1}^n d_{31} \Delta TSE_{t-i} + \sum_{i=1}^n d_{32} \Delta PORV_{t-i} + \sum_{i=1}^n d_{33} \Delta TPE_{t-i} + \sum_{i=1}^n d_{34} \Delta PUH_{t-i} + \sum_{i=1}^n d_{35} \Delta PRH_{t-i} + U_{3t} \quad (3.3.3)$$

$$\Delta PUH_t = a_1 + \sum_{i=1}^n d_{41} \Delta PUH_{t-i} + \sum_{i=1}^n d_{42} \Delta PORV_{t-i} + \sum_{i=1}^n d_{43} \Delta TPE_{t-i} + \sum_{i=1}^n d_{44} \Delta TSE_{t-i} + \sum_{i=1}^n d_{45} \Delta PRH_{t-i} + U_{4t} \quad (3.3.4)$$

$$\Delta PRH_t = a_1 + \sum_{i=1}^n d_{51} \Delta PRH_{t-i} + \sum_{i=1}^n d_{52} \Delta PORV_{t-i} + \sum_{i=1}^n d_{53} \Delta TPE_{t-i} + \sum_{i=1}^n d_{54} \Delta TSE_{t-i} + \sum_{i=1}^n d_{55} \Delta PUH_{t-i} + U_{5t} \quad (3.3.5)$$

Where: a_1 = intercept, $d_{11} - d_{55}$ = coefficient of the explanatory variables, Δ = First difference operator, n = maximum lag order and $U_{1t} - U_{4t}$ = random error terms.

3.3 Description of Variables and Data Sources

The dependent variable in this study is poverty level while gross primary and secondary school enrolments as proportions of total enrolments as well as private and public healthcare expenditures (as shares of GDP) were included as measures of human capital development (explanatory variables). Apart from data on poverty level culled from National Bureau of Statistics, data for the other variables in the model were extracted from World Bank WDI.

3.4 Method of Data Analysis

This Fully Modified Ordinary Least Squares (FM-OLS) developed by Phillips and Hansen (1990) was used in estimating the cointegrating regression model. This method of data analysis was selected given that it is helpful in overcoming some of the weaknesses associated with the static OLS. As a semi-parametric correction of the OLS estimator, the FM-OLS is asymptotically equivalent to maximum likelihood and yields median-unbiased and asymptotically normal estimates, so that the model overcomes the problem of serial correlation and conventional techniques for inference are valid. Additionally, the causality relationship among the series was examined using vector autoregressive (VAR) model. Some diagnostics tests carried out in the cause of this study were discussed below:

i. Unit Root Test: The unit root test was carried out using the Augmented Dickey Fuller (ADF) method as proposed by Dickey and Fuller (1981). Specifically, the null hypothesis of a unit root (non-stationarity) was tested against the alternative hypothesis of no unit root (stationarity) in each of the variables at 5 percent level. The algebraic form of the unit root is expressed as:

$$\Delta(X_t = m_0 + m_1(Y_{t-1}) + \sum_{i=1}^q \beta_i \Delta(X_{t-i}) + E_t \quad (3.4)$$

Where: X_t = variable being tested for unit root, m_1 and β_i = parameter estimates, q = maximum order of lag, Δ = notation for first difference, E_t = Error term

ii. Cointegration Test: This paper adopted Johansen and Juselius (1990) cointegration procedure, a multivariate-based approach for differenced stationary series. The null hypothesis of no cointegration was tested against the alternative of cointegration. The tests statistics (Trace and Maximum Eigen value statistics) are based on 5 percent level of significance. The model for the cointegration test is specified as:

$$J_{trace}(r) = -N \sum_{i=r+1}^n \log(1 - \hat{\lambda}_i) \quad (3.5)$$

$$J_{max}(r, r+1) = -N \log(1 - \hat{\lambda}_{r+1}) \quad (3.6)$$

Where: $F_{trace}(r)$ and $F_{max}(r, r+1)$ denote Trace and Max-Eigen statistics respectively

$\hat{\lambda}$ = coefficients of the characteristic roots, N = sample size, r = cointegrating vectors
 n = lag length and \log = notation for logarithm transformation

4. RESULTS AND DISCUSSIONS

4.1 Descriptive Analysis of the series

The descriptive statistics for the variables which dwelled mainly on the mean, minimum and maximum values, standard deviation and normal distribution of the series are presented in Table 4.1.

Table 4.1: Descriptive statistics for PORV, TPE, TSE, PUH, and PRH

	PORV	TPE	TSE	PUH	PRH
Mean	68.57222	93.70222	37.69278	1.071667	2.580556
Median	69.50000	93.28500	34.72500	1.000000	2.585000
Maximum	88.00000	101.6700	55.70000	1.470000	3.140000
Minimum	46.00000	83.76000	23.42000	0.620000	1.810000
Std. Dev.	10.09187	5.470299	10.34535	0.232588	0.365553
Jarque-Bera	0.180020	0.774442	1.334079	0.538247	1.177238
Probability	0.913922	0.678941	0.513226	0.764049	0.555093
Observations	18	18	18	18	18

Source: Calculated by the Author from E-views 9 statistical package

Table 4.1 presents the descriptive statistics for the series in the model. It was clear from the results that poverty level averaged 68.57 percent, indicating that over half of the populations are in poverty. The result equally indicates that the minimum and maximum levels of poverty over the study period (1990-2016) are 46 percent and 88 percent respectively. The average primary and secondary school enrolments as shares of the gross school enrolments are 93.70 percent and 36.69 percent respectively. This is indicative that the access to primary education is beyond that of secondary education by 57.11 percent. Additionally, public healthcare spending as a share of GDP is associated with the mean value of 1.07 percent while private healthcare spending averaged 2.58 percent. The maximum values of healthcare expenditure (as a share of GDP) are 1.47 percent for public healthcare spending and 3.14 percent for private healthcare spending. The respective standing deviations for the variables indicate that the observations for the series converged around their respective mean values. It was also discovered from the Jarque-Bera statistics that the errors in each of the variables are normally distributed.

4.2 Test for Unit Root

The unit root test was performed at 5 percent level using ADF approach. The results are displayed in Table 4.2.

Table 4.2: Unit root test results

Variable	Levels test results		1 st diff. test results		Order of integration
	t-statistic	Lag order	t-statistic	Lag order	
PORV	-1.947 (0.601)	0	-5.394 (0.001)	0	I (1)
TPE	-2.065 (0.540)	0	-4.077 (0.019)	0	I (1)
TSE	-2.869 (0.195)	0	-4.889 (0.007)	0	I (1)
PUH	-2.093 (0.519)	0	-5.126 (0.003)	0	I (1)
PRH	-4.108 (0.021)	0	NC	NC	I(0)

Source: Calculated by the Author from E-views 9 statistical package

NB: Figures in parenthesis are the corresponding Mackinnon (1996) one-sided p-values.

The unit root test results in Table 4.1 shows that only private healthcare expenditure (PRH) is stationary at levels as the probability value (0.021) of the t-statistic (-4.108) below 0.05. The other variables in the model become stationary at first difference. Therefore, it is clear from the result that the variables are mixed integrated with PRH being integrated of order one while PORV, TPE, TSE and PUH are integrated of order one.

4.3. Test for Cointegration

Like the unit root test, the cointegration test was carried out at 5 percent level. The result is showed in Table 4.3.

Table 4.3: Cointegration test result

Series: PORV TPE TSE PUH PRH				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.990536	132.7772	76.97277	0.0000
At most 1 *	0.832658	58.21343	54.07904	0.0204
At most 2	0.585542	29.60996	35.19275	0.1766
At most 3	0.433981	15.51741	20.26184	0.1982
At most 4	0.330155	6.411354	9.164546	0.1613
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.990536	74.56374	34.80587	0.0000
At most 1 *	0.832658	28.60347	28.58808	0.0498
At most 2	0.585542	14.09255	22.29962	0.4536
At most 3	0.433981	9.106053	15.89210	0.4225
At most 4	0.330155	6.411354	9.164546	0.1613

Source: Calculated by the Author from E-views 9 statistical package

Table 4.3 shows the cointegration tests results for the series in the model. Both the trace and Max-Eigen tests results indicate that two cointegrating equations exist in the model. This is because the calculated trace and Max-Eigen statistics are more than their associated critical values. The implication of this finding is that PORV, TPE, TSE, PUH, and PRE are cointegrated. This evidence of cointegration attests to long-run relationship in the variables and provides the empirical basis for estimating the cointegrating regression model using FM-OLS approach.

4.4 Cointegrating Regression Analysis

The cointegrating regression model was estimated using FM-OLS. The result is reported in Table 4.4.

Table 4.4: Cointegrating regression result

Dependent Variable: PORV					
Method: Fully Modified Least Squares (FMOLS)					
Sample (adjusted): 2000 2016					
Included observations: 17 after adjustments					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
TPE	-0.697	0.265	-2.632	0.021	
TSE	-0.836	0.166	-5.038	0.000	
PUH	-16.629	7.021	-2.369	0.036	
PRH	-1.990	4.337	-0.459	0.655	
C	187.669	29.859	6.285	0.000	
R-squared	0.578	Mean dependent var		68.371	
Adjusted R-squared	0.437	S.D. dependent var		10.365	
S.E. of regression	7.779	Sum squared resid		726.24	
Long-run variance	26.381				

Source: Calculated by the Author from E-views 9 statistical package

The regression estimates in Table 4.4 show that the coefficients of the regressors are consistent with the hypothesized negative signs. The result shows that primary school enrolments, secondary school enrolments, and public healthcare expenditure are significantly related to poverty level while private healthcare spending does not exert significant influence on poverty level. A percentage increase in primary school enrolment reduces poverty by 0.697 percent while a percentage increase in secondary school enrolment contracts poverty by 0.84 percent. This finding is in accordance with the finding of Pervez (2014) that gross secondary school enrolment has a negative and significant impact on poverty in the long run. The implication of this finding is that access to education provides the opportunity for reducing the population in poverty. Similarly, a percentage increase in public healthcare spending, on the average, reduces poverty by 16.63 percent. This is indicative that public sector spending in the health sector is robust in reducing the level and depth of poverty in Nigeria. The coefficient of determination (0.578) indicates that 58 percent of the aggregate variations in poverty level are due to changes in the explanatory variables in the model.

4.4.1 Diagnostics Tests

The diagnostics tests were carried out at 5 percent level. The results are presented in Table 4.5 and Figure 4.1

Table 4.5: Serial correlation test result

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. ** .	. ** .	1	0.243	0.243	1.1899	0.275
. * .	. * .	2	-0.077	-0.145	1.3179	0.517
. .	. .	3	-0.022	0.037	1.3291	0.722
. .	. * .	4	-0.060	-0.081	1.4191	0.841
. * .	. * .	5	0.079	0.128	1.5891	0.903
. * .	. ** .	6	-0.182	-0.283	2.5624	0.861
. * .	. .	7	-0.159	0.008	3.3768	0.848
. * .	. * .	8	-0.140	-0.197	4.0796	0.850
. * .	. .	9	-0.111	-0.003	4.5775	0.869
. .	. * .	10	-0.038	-0.128	4.6432	0.914
. .	. .	11	-0.055	0.025	4.8049	0.940
. .	. .	12	0.038	-0.039	4.8985	0.961

Source: Calculated by the Author from E-views 9 statistical package

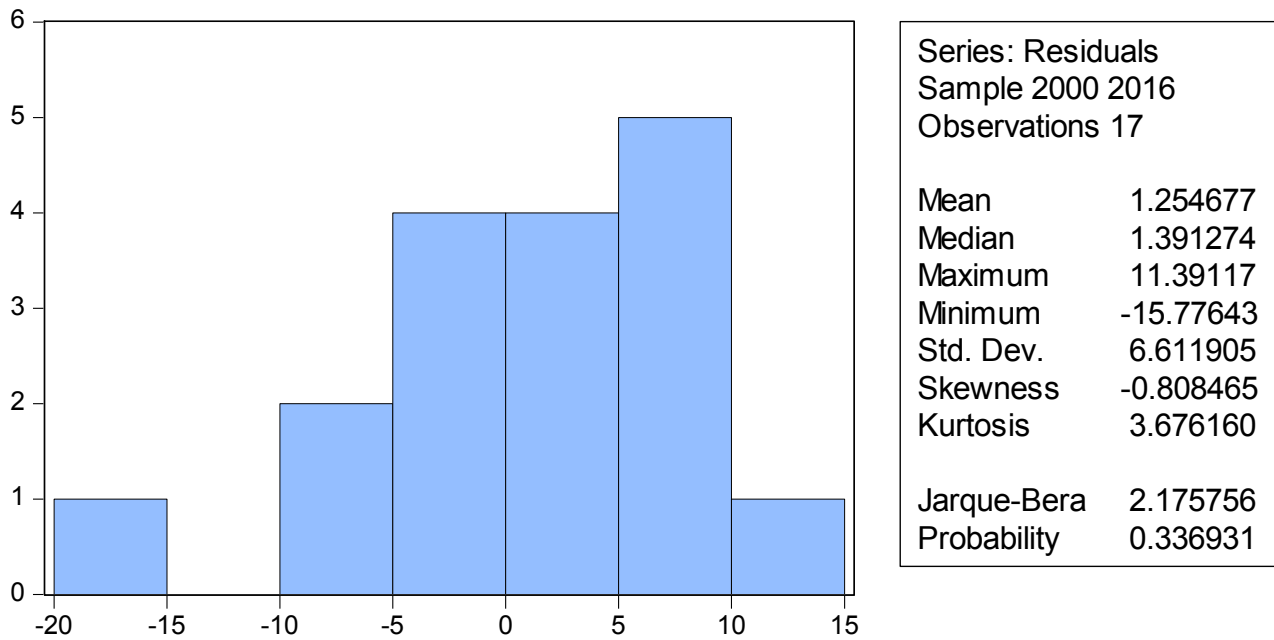


Figure 4.1: Normality test result

The serial correlation test result in Table 4.5 shows that residuals are uncorrelated at 0.05 levels of significance. This is because the associated probability values of the Q-statistics are greater than 0.05. This suggests that the model is free from autocorrelation. Again, it was found that the residuals are normally distributed as the probability value (0.337) of the Jarque-Bera statistic (2.175) exceeds 0.05.

4.5 Granger Causality/Block Exogeneity Wald Tests

The causal relationship between human capital development and poverty level were estimated using Granger test for causality. The significance was 5 percent, and the results are reported in Table 4.6.

Table 4.6: Causality test result.

Sample: 1990 2016			
Included observations: 17			
Dependent variable: PORV			
Excluded	Chi-sq	df	Prob.
TPE	3.517370	1	0.0607
TSE	8.576796	1	0.0034
PUH	3.406547	1	0.0649
PRH	22.89361	1	0.0000
All	44.44158	4	0.0000

Source: Calculated by the Author from E-views 9 statistical package

NB: df denotes the degree of freedom.

The causality test results in Table 4.6 indicate that a unidirectional causality runs from gross secondary school enrolment and private healthcare expenditure to the poverty level. This is because the respective probability values (0.003 and 0.000) of their chi-square statistics (8.58 and 22.89) are greater than 0.05. The results also show that joint causality runs from the explanatory variables to the poverty level. This is based on the fact that the probability value (0.000) of chi-statistic (44.44) is more than 0.05. This finding suggests that the human capital is an actual fact important in predicting changes in the poverty level.

5. Conclusion and Recommendations

5.1 Conclusion

For developing countries, low and middle income alike, developing human capital is adjudged as key for reducing poverty. In view of this, critical efforts were made in this study to determine the relationship between human capital development and poverty reduction in Nigeria. The FM-OLS and Granger causality test formed for the data analysis. The results showed that school enrolments comprising gross primary and secondary enrolments are significant in reducing the level of poverty in Nigeria. It was also found that public healthcare spending contributes significantly to poverty reduction the period covered. The Granger causality test shows that the explanatory variables collective have very high predictive powers for poverty level. Given the findings, it is concluded that building human capital is a fundamental and an effective strategy for reducing poverty level.

5.2 Recommendations

Given the findings associated with this finding, the following policy recommendations are provided:

1. Policy makers should ensure that poverty reduction strategy in Nigeria provides for increased access to education through gross primary and secondary school enrolments.
2. Public healthcare expenditure should be prioritized in the fiscal policy framework with a view to developing the stock of human capital through improved health status.
3. Pro-poor and equitable income distribution should be promoted to boost gross private healthcare spending in order to improve the health status and reduce the level and intensity of poverty.

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