



## EMPIRICAL ANALYSIS OF HUMAN CAPITAL DEVELOPMENT AND POVERTY REDUCTION IN NIGERIA (1981-2022)

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source are credited.

**ABSTRACT:** *This study examined the impact of human capital development on poverty reduction in Nigeria covering the period 1981-2022. Data for the research were annual times series data on total education expenditures, total health expenditures, and inflation extracted from the Central Bank of Nigeria Statistical Bulletin 2020 and poverty rate, out-of-pocket expenditures, and human development index collected from World Development indicators. The methodology adopted in the study is linear regression with the application of the Ordinary Least Squares (OLS) technique. Other diagnostic tests which include unit-root test, autocorrelation, and normality test were carried out in the study. The major findings of the study were that total education expenditures (TOEDXP) have a positive and insignificant contribution to poverty reduction in Nigeria, total health expenditures (TOHEXP) have a positive and insignificant contribution to poverty reduction in Nigeria, and out-of-pocket expenditures (OOPE) have a positive and insignificant contribution to poverty reduction in Nigeria. It is therefore the recommendation of the study that the government should also increase its expenditure on health and education. It is a fact that health is wealth and therefore, there is a need to provide a good environment, health facilities, an increased rate of doctor to patient ratio, health workers motivation and increased remuneration amongst others and also government should increase its expenditure on education as this would improve the standard of living of the citizens.*

**KEYWORDS:** Human Capital, Poverty, Development.



## INTRODUCTION

Human capital, in common parlance, refers to the abilities and skills of human resources, whereas human capital development refers to the process of acquiring and increasing the number of people who have the necessary skills, education, and experience for a country's economic growth (Harbison, 2018). It is a theoretical fact that Human Capital Development (HCD) has a positive impact on economic growth. However, it may not apply or equally be true in all empirical situations as this depends on a lot of factors such as the quality and quantity of education, government policy on education, and the structure of the economy, among others. Hence, the examination of the relationship between human capital development and economic growth in Nigeria is an outstanding empirical verification exercise whose need cannot be disputed. Nigeria as a country is immensely endowed both in natural and human resources. Nigeria used to depend on physical capital for its growth and development without taking into consideration the role played by human capital in the development process.

Human capital development has been described as an end or objective of development. It is a way to fulfil the potential of people by enlarging their capabilities, and this necessarily implies empowerment of people, enabling them to participate actively in their development. Human capital development enhances the skills, knowledge, productivity, creativity, and inventiveness of people. Thus, human capital development is people and not goods or production-centred strategy of development. Essentially, it is the empowerment of people to identify their priorities and implement programmes and projects of direct benefit to them. This in turn implies the active participation of people in the development process and the consequent need to evolve institutions that permit and indeed encourage that participation (Hussein, 2017).

Poverty in Nigeria did not become an issue of great concern until after the oil boom when the international oil price crashed and there was an international economic slump. The continuous downward trend in the oil prices in the international market increased the poverty level in Nigeria. Since the late 1980s, an increase in government expenditure has become a major instrument in Nigeria. Nigeria's poverty situation is quite alarming. Both the quantitative and qualitative measurements show the rising prevalence and gravity of poverty in the country. This situation, however, is quite ironic given the enormous physical and human resources that the country is blessed with. A more disquieting truth is the fact that successive governments have invested huge material and human resources to arrest the poverty situation, but significant improvements have not been recorded in that direction. The Human Development Report in 2019 reveals that Nigeria is one of the poorest among the poor countries in the world. Nigeria ranks 54th on the human poverty index (HPI) - making it the 20th poorest country in the world. It is also ranked 30th in the gender-related development index (GDI) while occupying the 40th position from below in its human development index (HDI), these figures have not significantly improved for the better to date. It is in line with the foregoing, that this study seeks to examine the impact of human capital development on poverty reduction on the Nigerian economy.



## LITERATURE REVIEW

### The Concept of Human Capital Development

Human capital refers to the abilities and skills of human resources and human capital development refers to the process of acquiring and increasing the number of persons who have the skills, education and experience which are critical for the economic growth of the country ( Harbison, 2018).

Onakoya (2016) describes human capital as an important factor used in converting all resources to benefit mankind. Human capital development is strategic to the Socioeconomic development of a nation and includes education, health, labour, employment and women's affairs. Investing in human capital development is therefore critical as it is targeted towards ensuring that the nation's human resources endowment is knowledgeable, skilled, productive, and healthy to enable the optimal exploitation of other resources to produce growth and development. In a nutshell, investment in human capital means expenditure on health, education, and social services in general but in a narrow sense, it is capable of measuring all expenditures on social services.

For this study, the two basic objectives of human capital development will be the centre of focus which are Education and Health. They are important ends in themselves. Health is central to well-being and education is essential for a satisfying and rewarding life: both are fundamental to the broader notion of expanding human capability that is at the heart of the meaning of development (Todaro & Smith, 2009).

According to Galbraith (2011), industrial growth is a function of investment in human capital development rather than physical capital. Therefore, there is a complementary role between physical capital and human capital. With numerous pathways, there is a causal system linking education and health as discussed below. Capital stock depends to a considerable extent on human capital formation which is the process of increasing the knowledge, skills, and capacities of all people of the country.

Human capital accumulation can be derived from investing in individuals or groups of individuals via education, training, skill development and social security schemes. However, according to Schultz (1999), as cited in Adekoya (2016), it is crucial to develop the skills, expertise, and knowledge of people who are value creators. Schultz further elaborates on some ways for developing human capital which include: investment in services that are construed to improve life expectancy and general well-being of the people, training, and development (both on-the-job and off-the-job), and formal education at all levels (including adult education)

### Poverty

According to Ekpe (2016), poverty is general scarcity or dearth, or the state of one who lacks a certain amount of material possessions or money. It is a concept with diverse aspects which include social, economic, and political elements. Poverty has been described as either temporary or extreme with the concept of inequality. United Nations (2001) asserts that poverty is the inability to get choices and opportunities, a violation of human dignity. It means a lack of basic capacity to participate effectively in society. To them, it means not having enough to feed and clothe a family, and not having a school or clinic to attend. Not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means



insecurity, powerlessness, and exclusion of individuals, households, and communities. It means susceptibility to violence, and it often implies living in marginal or fragile environments, without access to clean water or sanitation.

Poverty, according to the World Bank (2014), is construed to be a deprivation in the personal well-being of individuals or a group of people. It comprises people with the inability to attain the necessary materials for living and survival resulting from their low incomes. Poverty is also stated to include elements of poor health conditions, low rate of literacy, inaccessibility to drinkable water and a safe environment, lack of adequate security, and lack of access to life-changing opportunities.

## **Theoretical Review**

### **Human Development Theory**

The human development theory was made popular by Amartya Sen, Mahbubul Haq and UnerKirdar in 1971. The theory is known for its measurement of human welfare and for probing the effects of uneconomic growth on human health. Nonetheless, the theory seeks to measure and ensure optimality in human well-being via the integration between instructional capital and social capital deployment to further translate into an optimal value of human capital forming a part of an ecological system. Individualistic roles within the ecological system are therefore essential to determine the level of adaptation within the system. According to the theory, the basic purpose of development is to enlarge human freedom. The process of development is to expand human capabilities by expanding the choices that people have in their full and creative lives. People are both the beneficiaries of such development and the agents of progress as well as the change that they bring about. This process must benefit all individuals equitably and build on the participation of each of them.

### **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 exists which determines the individual's level of productivity. Jung and Smith (2007) observe that in the views of 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 levels of human capital such as improved health status and education tend to reduce the incidences of poverty due to public sector intervention. This is an indication that the intervention of the public sector through increased expenditure components 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 are located in abroad.



## 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) opine that a particular aspect of neoclassical economics dwells on individual choices about education, training, and mobility in explaining varying outcomes in the dimensions of human development. Lydall (1968) further explain that variation in the combination of intelligence, environment, and education of 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) opine that the policy option that emanates from this human-capital-oriented perception of poverty is that the increased spending on education helps the poor to attain improved earnings potential.

## Empirical Review

Olatunji (2022) examined the relationship between some elements of human capital development and poverty alleviation in Nigeria, from 1995-2017. It investigated the causal relationship between the human capital development explicitly measured in health and education and its impact on poverty alleviation measured by per capita income over the period stated. The study uses the Granger causality test through a vector error correction mechanism (VECM), to determine whether the elements of education and health care affect per capita income. The result indicates that there is no causality either uni-directional or bi-directional between government expenditure on education and health, infant mortality, gross enrolment ratio and per capita income but cases of uni-directional causality existed for literacy rate, life expectancy, and per capita income.

Chikelu (2019) examined the impact of human capital development on poverty reduction in Nigerian economy for the period 1986 to 2015. The Ordinary Least Squares (OLS), Augmented Dickey-Fuller and Johansen Co-integration methods were used to estimate the model of one dependent variable (poverty rate) and four explanatory variables (primary school enrolment, secondary school enrolment, tertiary school enrolment and per capita income). The study reveals that there exists a relationship between human capital development and poverty reduction in Nigeria.

Dennis (2020) 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 Development Indicators. Fully Modified Least Squares and Granger causality test, in addition to ADF unit root and Johansen-Juselius cointegration tests, were employed. It is evident from the unit-root test result that the variables have mixed order of integration,  $I(0)$  and  $I(1)$ . 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 the poverty level





while private healthcare spending does not exert a significant influence on the poverty level. A percentage increase in primary school enrolment reduces poverty by 0.697 per cent while a percentage increase in secondary school enrolment reduces poverty by 0.84 per cent. Similarly, a percentage increase in public healthcare spending, on average, reduces poverty by 16.63 per cent. This is indicative that public sector spending on 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.

Allahdadi and Aref (2011) analysed 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 a descriptive statistics approach. It was revealed from the empirical analysis that there was little effort to build a human resource for poverty alleviation. The result also shows evidence of a high level of education among local people while rural areas are found to face some challenges which hinder their participation in poverty alleviation.

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 the government should focus on the quantity and quality of education that promotes more research in the country.

Self and Grabowski (2014) 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 causal 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 more robust causal impact on growth than the impact for secondary education. The results also show that female education at all levels has the potential to generate economic growth while male has a significant impact on growth only at the primary level.

Mallick (2018) investigates the dynamics of expenditure on education and economic growth in selected 14 major Asian countries by using balanced panel data from 1973 to 2017. The results of Pedroni cointegration state the existence of long-run equilibrium relationships between expenditure on education and economic growth in all the countries. The FMOLS results revealed a positive and statistically significant impact of education expenditure on the economic development of all 14 Asian countries (Bangladesh, China, Hong Kong, India, Japan, Nepal, Pakistan,

Malaysia, the Philippines, Saudi Arabia, Singapore, Sri Lanka, Thailand, and Turkey). Further, the panel vector error correction (PVECM) presents unidirectional Granger causality running from economic growth to expenditure on education both in the short- as well as in the long run. But, expenditure on education only Granger causes economic growth in the long run in all the countries.

Liping (2017) explore the cointegration and causality between the investment in education and sustainable economic growth in Guangdong province in China by using the panel data on 21



cities from 2000 to 2016. He constructed a variable intercept panel data model with an individual fixed effect based on the Cobb-Douglas production function, estimating the contribution of the investment in education to economic growth by introducing lags. The findings show the existence of the feedback causality between education and sustainable economic growth. Also, the results reveal that the local financial investment in education plays a positive and statistically significant role in promoting sustainable economic growth. However, the contribution of the local financial investment in education to economic growth varies in different areas. The investment in education in the Pearl River Delta region have the most obvious pull effects on its regional economy, whereas the Western region takes the second place. Meanwhile, the local financial investment in education for its role in promoting economic growth obviously has a two-year hysteresis effect. These findings have important implications for Guangdong's solution to the imbalance between regional educational investment and sustainable economic growth.

## METHODOLOGY

### Research Design

The investigation employed the *Ex Post Facto* design given that it is targeted at analyzing the impact of some independent variables on a specified dependent variable. This study makes use of econometric procedure in estimating the impact of human capital development on poverty reduction in Nigeria.

### Model Specification

According to Koutsoyiannis (2003), a model specification is a mathematical expression which involves the determination of a dependent given a set or sets of independent variables.

The model for this study is specified thus:

In implicit form, we have:  $POVR = f(TOEDXP, TOHEXP, OOPE, HDI, INF) \dots \dots 3.1$

Transforming equation 3.1 into an explicit econometric form, we have:

$$POVR_t + \beta_0 + \beta_1 TOEDXP_t + \beta_2 TOHEXP_t + \beta_3 OOPE_t + \beta_4 HDI_t + \beta_5 INF_t + \mu_t \dots (3.2)$$

Where,

POVR = Poverty Rate (Head Count Ratio)

TOEDXP = Total Government Education Expenditures

TOHEXP = Total Government Health Expenditures

OOPE = Out of Pocket Expenditures

HDI = Human Development Index

INF = Inflation Rate

$\mu$  = The stochastic error term



$\beta_0, \beta_1, \beta_2, \beta_3$  = Parameters of the independent variables to be estimated.

For the actualization of objective three which is to test the direction of causality between human capital development and economic growth, the Granger causality model is specified thus:

## Techniques of Analysis

### Unit Root Test

To avoid spurious regression estimates, time series data should be examined for stationarity or order of integration. Time series data is accepted to be stationary if “it exhibits mean reversion in that it fluctuates around a constant long-run mean, has a finite variance that is time-invariant and has a theoretical correlogram that diminishes as the lag length increases” (Asteriou, 2006, p.247).

There are many tests trying to find the order of integration of series and among them Dickey-Fuller, Augmented Dickey-Fuller and Phillips and Perron tests are the most widely used ones in testing the presence of unit roots. Dickey-Fuller (DF) test is based on the following model:

$$\Psi_t = \lambda\Psi_{t-1} + \varepsilon_t \quad (3.4.1)$$

The model can also be expressed as:

$$\Delta\Psi_t = \varpi\Psi_{t-1} + \varepsilon_t \quad (3.4.2)$$

where  $\varpi = (\lambda - 1)$ . This model is called pure random walk model. Null hypotheses are  $H_0 : \lambda = 1$  for model (3.4.1) and  $H_0 : \varpi = 0$  for model (3.4.2). The corresponding alternative hypotheses are  $H_a : \lambda < 1$  and  $H_a : \varpi < 1$  respectively. If DF test statistic (t-statistic of lagged dependent variable) is less than the critical value, we reject the null hypothesis and conclude that the series is stationary (there is no unit root). Model (3.4.2) can be extended by including a constant term and/or the trend.

The corresponding models are called random walk with drift and random walk with drift and time trend:

$$\begin{aligned} \Delta\Psi_t &= \alpha_0 + \Omega\Psi_{t-1} + \varepsilon_t \\ \Delta\Psi_t &= \alpha_0 + \beta_2 t + \Omega\Psi_{t-1} + \varepsilon_t \end{aligned}$$

Where:  $\Omega = (\lambda - 1)$ . The two models have same testing procedures with the random walk model.

However, Equation (3.4.2) does not consider autocorrelation. Augmented Dickey-Fuller (ADF) test is used to test existence of unit root when there is autocorrelation in the series and lagged terms of the dependent variable are included in the equation. The following three models





represent pure random walk, random walk with drift and random walk with drift and trend used in Augmented Dickey Fuller tests:

$$\Delta \psi_t = \Omega \psi_{t-1} + \sum_{i=1}^p \beta_i \Delta \psi_{t-1} + \varepsilon_t$$

$$\Delta \psi_t = \alpha_0 + \Omega \psi_{t-1} + \sum_{i=1}^p \beta_i \Delta \psi_{t-i} + \varepsilon_t$$

$$\Delta \psi_t = \alpha_0 + \Omega \Psi + \beta_2 t + \sum_{i=1}^p \beta_i \Delta \psi_{t-1} + \varepsilon_t$$

where:  $\Omega = (\lambda - 1)$  The null hypothesis is  $H_0 : \Omega = 0$  and the alternative hypothesis is  $H_a : \Omega < 0$ . If ADF test statistic (t-statistic of lagged dependent variable) is less than the critical value, we reject the null hypothesis and conclude that the series is stationary (there is no unit root).

### Co-integration Test

The co-integration technique allows for the estimation of a long-run equilibrium relationship. Simply put, one can argue that various non-stationarity time series are co-integrated when they are linear combination are stationary. One of the most popular tests for cointegration has been suggested by Engel and Granger (1987). The process is demonstrated thus; given a multiple regression:  $y_t = \beta' x_t + \mu_t, t = 1, \dots, T$ , where  $x_t = (x_{1t}, x_{2t}, \dots, x_{kt})'$  is the k-dimensional I(1) regressors. For  $y_t$  and  $x_t$  to be cointegrated,  $\mu_t$  must be I(0). Otherwise it is spurious. Thus, a basic idea is to test whether  $\mu_t$  is I(0) or I(1).

### Error Correction Mechanism

The Error Correction Model (ECM) will be estimated to reveal and correct the existence of short-run disequilibrium and the speed of adjustment mechanism.

The Error correction model is specified thus

$$\Delta Y_t = \theta_0 + \theta_1 z_{t-1} + \sum \theta_{2i} \Delta X_{t-1} + \sum \theta_{3i} \Delta Y_{t-1} + \varepsilon_t$$

Where  $\Delta$  denotes the first-order time difference (i.e.  $\Delta y_t = y_t - y_{t-1}$ ) and where  $\varepsilon_t$  is a sequence of independent and identically distributed random variables with mean zero and variance.

### The Test of Goodness of Fit [ $R^2$ ]

To test for the explanatory power of the independent variable, the coefficient of determination;  $R^2$  will be applied. The essence of the application of this statistic is that it will be used to measure the explanatory power of the independent variable(s) over the dependent variable. This statistic is thus used as a test of goodness of fit.  $R^2$  lies between zero and one ( $0 \leq R^2 \leq 1$ ).



The closer  $R^2$  is to 1 the greater the proportion of the variation in the dependent variables attributed to the independent variables.

### **t-Statistical Test of Significance**

To carry out the test of individual regression coefficient, the t-statistics will be used. The justification of the t-statistics is that it will be employed to analyze the statistical significance of the individual regression coefficient. A two-tailed test will be conducted at 5% level of significance. The null hypothesis  $H_0$  will be tested against the alternative hypothesis  $H_1$ .

### **Decision Rule**

If the computed t-statistics is greater than the tabulated t-statistics at 5% level of significance, we reject the null hypothesis ( $H_0$ ) and accept the alternative hypothesis ( $H_1$ ). But if otherwise, we accept the  $H_0$  and reject the  $H_1$ .

### **F-Statistical test of Significance**

To Test the statistical significance of the joint force regression plane, the f-ratio is used. The test will be conducted at 5% level of significance.

Note:  $t^*$  = computed t – value

$t_{0.025}$  = tabulated t – value

$f^*$  = Computed f-value

$f_{0.05}$  = tabulated f – value

### **Decision Rule**

If the computed f-statistics is greater than the tabulated f-statistics, we accept that the test is statistically significant at the entire regression plane. But if otherwise, we conclude that the test is not statistically insignificant at the entire regression plane.

### **Robustness Tests**

#### **Autocorrelation Test: (Second Order Test)**

The presence of autocorrelation problem will be evaluated with the application of Durbin-Watson Statistic. The region of no autocorrelation remains:

$$du < d^* < (4-du)$$

Where:

$du$  = Upper Durbin – Watson

$d^*$  = Computed Durbin-Watson



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### **Decision Rule**

If the computed Durbin Watson statistic falls into the zero-autocorrelation region, we conclude that there is no presence of autocorrelation problem in the model, but if the computed Durbin-Watson statistic falls outside the zero-autocorrelation region, we conclude that there is presence of autocorrelation problem in the model.

### **Normality Test**

The normality test will be carried out to ascertain if the residuals of the model are normally distributed. The basis of the decision will be based on the value of the Jaque-Berra [JB].

### **Decision Rule**

If the JB statistics yields a value close to or equal to zero, we accept the null hypothesis of normal distribution, but if otherwise we reject the normal distribution hypothesized value.

### **Heteroscedasticity Test**

The primary essence of this test is to evaluate if the variance of the residuals are constant overtime. It is thus based on ascertaining if the series possess the Homoscedasticity property. The basis of judging the heteroscedastic status of the residuals is based on comparing the values between the Computed Chi-Square [ $X^2$ ] and the tabulated version.

### **Decision Rule**

If the computed  $X^2$  exceeds the tabulated  $X^2$ , we conclude that there is the presence of heteroscedasticity in the residuals but if otherwise, we conclude there is the presence of homoscedasticity in the residual series.

### **Data Required and Sources**

The data required for this study is time series secondary on poverty rate, federal government expenditures on education, health, out of pocket expenditures, and inflation covering the period 1981-2022. The data will be extracted from the Central Bank of Nigeria (CBN) statistical bulletin.



## PRESENTATION AND ANALYSIS OF DATA

### The Empirical Results

Time series data are often assumed to be non-stationary and thus, it is necessary to perform unit root tests to ensure that the data are stationary. The test was employed to avoid the problem of spurious regression results. Therefore, the Augmented Dickey-Fuller (ADF) unit root test was used to determine the stationarity status of the variables. The decision rule based on the ADF test is that its statistic must be greater than Mackinnon's Critical Value at a 5% level of significance and in absolute terms. The results of the unit-root test are reported in Table 4.1 below.

### Unit-Root Test Result

**Table 4.1:** *Unit Root Test Result*

VARIABLE	ADF STAT.	CRITICAL VAL.	ORDER
POVR	-7.368178	-2.941145	I(1)
TOEDXP	-3.916196	-3.574244	I(1)
TOHEXP	-4.354752	-3.548490	I(1)
OOPE	-6.485180	-3.533083	I(1)
HDI	-3.026516	-2.951125	I(1)
INF	-5.417873	-2.948404	I(1)

**Source:** *Author's Computation Using E-views 10.*

Table 4.1 clearly shows that all the variables are stationary at first difference, (I(1)). This means that the variables have unit root until differenced in the first order.

### Cointegration Analysis (Johansen Method)

**Table 4.2**

Included observations: 38 after adjustments  
 Trend assumption: Linear deterministic trend  
 Series: POVR TOEDXP TOHEXP OOPE HDI INF  
 Lags interval (in first differences): 1 to 1

#### Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.930896	188.7916	95.75366	0.0000
At most 1 *	0.695316	87.25020	69.81889	0.0011
At most 2	0.498993	42.08801	47.85613	0.1563
At most 3	0.192399	15.82486	29.79707	0.7245
At most 4	0.179157	7.704763	15.49471	0.4975
At most 5	0.005320	0.202688	3.841466	0.6526



Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Source:** *Author's Computation Using E-views 10.*

The Johansen method of cointegration was used for the study because all the variables are stationary at first difference. The Johansen result as displayed in table 4.2 clearly shows evidence of cointegration as the trace statistic test indicates 2 cointegrating equations at a 5% level of significance. The trace statistic of none\* yielded  $188.7916 > 95.75366$  critical value at a 5% level of significance. The trace statistic of at most 1\* yielded  $87.25020 > 69.81889$  critical value at a 5% level of significance. Here, the null hypothesis of no cointegration is rejected meaning that there exists a long-run relationship existing between poverty rate (POVR), total education expenditures (TOEDXP), total health expenditures (TOHEXP), out-of-pocket expenditures (OOPE), human development index (HDI) & inflation (INF).

**Table 4.3 Regression Analysis (Error Correction Mechanism)**

Dependent Variable: D(POVR)

Method: Least Squares

Sample (adjusted): 1982 2022

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.600725	0.820988	0.731710	0.4697
D(TOEDXP)	0.004810	0.030002	0.160333	0.8736
D(TOHEXP)	0.014476	0.038787	0.373212	0.7115
D(OOPE)	8.663526	0.000144	0.056983	0.9549
D(HDI)	116.7740	86.08168	1.356548	0.1844
D(INF)	0.068512	0.047966	1.428368	0.1629
ECM(-1)	-0.434858	0.120424	-3.611044	0.0010
R-squared	0.323176	Mean dependent var	0.915693	
Adjusted R-squared	0.296272	S.D. dependent var	5.198820	
S.E. of regression	4.660788	Akaike info criterion	6.077395	
Sum squared resid	695.1343	Schwarz criterion	6.375983	
Log likelihood	-111.5092	Hannan-Quinn criter.	6.184526	
F-statistic	2.546609	Durbin-Watson stat	2.022770	
Prob(F-statistic)	0.039510			

**Source:** *Author's Computation Using E-views 10.*





It can be clearly seen from table 4.3 that the numerical coefficient of total expenditures on education (TOEDXP) is positive at the magnitude of 0.004810 and statistically insignificant as the probability value yielded  $0.8736 > 0.05$ . This entails that federal government expenditures on the education sector have positive but insignificant impact on poverty in Nigeria for the years under analysis. This however does not conform to economic a priori expectation but this is prevalent in an economy like Nigeria.

The result also reveals that the numerical coefficient of total health expenditures (TOHEXP) yielded a positive numerical coefficient at the magnitude of 0.8736 and with statistical insignificance given that the probability value yielded  $0.7115 > 0.05$ . This entails that federal government health expenditures have no significant impact on poverty reduction in Nigeria. This does not also conform to economic a priori expectation.

Out of pocket expenditures (OOPE) yielded a positive but statistically insignificant numerical coefficient at the magnitude of 0.9549 and a p-value =  $0.9549 > 0.05$ . This entails a 1% increase in OOPE, increases poverty by 0.9549%. This conforms to economic a priori expectation because when people spend on health and education out of their pocket, it reduced aggregate demand and this has a poverty-driven macroeconomic effect.

The coefficient of human development index (HDI) yielded a positive numerical value at a magnitude of 116.7740. This entails that over the years, human development index in Nigeria has not had a reductive effect on poverty rates in Nigeria.

Inflation yielded a positive and insignificant numerical coefficient at the magnitude of 0.068512 and a probability value of  $0.1629 > 0.05$ . This entails that a 1% increase in inflation will lead to an increase in poverty by 0.068512 and vice-versa. This conforms to economic a priori expectation because of the relationship between price level and naira purchasing power.

### **Coefficient of Multiple Determination ( $R^2$ )**

The R-Squared yielded 0.323176. This entails that the explanatory power of the independent variables is not strong. It practically entails that variation in the dependent variable is not attributed to changes in the independent variables. Hence, other variables that affect the dependent variable does so at approximately 68%.

### **F-Statistic**

The F-statistics measures the statistical significance of the entire regression plane. The F-statistics ratio of 2.546609 with probability ratio of 0.039510 confirmed that the explanatory variables are jointly and statistically significant. Hence, the test is statistically significant at the entire regression plane.

### **Error Correction Term (ECM)**

The coefficient of the ECM term ( $\Theta$ ), which measures the speed of the adjustment of the variables at which equilibrium is restored yielded -0.434858 and correctly signed (negative) at the 5 percent level. The speed of adjustment, which is 43.4% suggests that poverty in Nigeria adjusts speedily to the long-run equilibrium changes in the explanatory variables and it gives the proportion of the disequilibrium error accumulated in the previous period that is corrected in the current period.



### Autocorrelation Test (Breusch-Godfrey)

**Table 4.4**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.661874	Prob. F(2,30)	0.5233
Obs*R-squared	1.648149	Prob. Chi-Square(2)	0.4386

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 01/01/24 Time: 07:18

Sample: 1982 2022

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.064150	0.831761	-0.077125	0.9390
D(TOEDXP)	-0.002014	0.030688	-0.065636	0.9481
D(TOHEXP)	0.003351	0.039598	0.084616	0.9331
D(OOPE)	-3.58E-06	0.000146	-0.024525	0.9806
D(HDI)	36.71635	93.93807	0.390857	0.6987
D(INF)	-0.026456	0.058112	-0.455268	0.6522
ECM(-1)	-0.080168	0.192173	-0.417166	0.6795
RESID(-1)	0.017016	0.279499	0.060880	0.9519
RESID(-2)	0.259168	0.228265	1.135382	0.2652

R-squared	0.042260	Mean dependent var	1.82E-16
Adjusted R-squared	-0.213137	S.D. dependent var	4.277033
S.E. of regression	4.710831	Akaike info criterion	6.136780
Sum squared resid	665.7578	Schwarz criterion	6.520679
Log likelihood	-110.6672	Hannan-Quinn criter.	6.274519
F-statistic	0.165469	Durbin-Watson stat	2.005194
Prob(F-statistic)	0.993941		

**Source:** *Author's Computation Using E-views 10.*



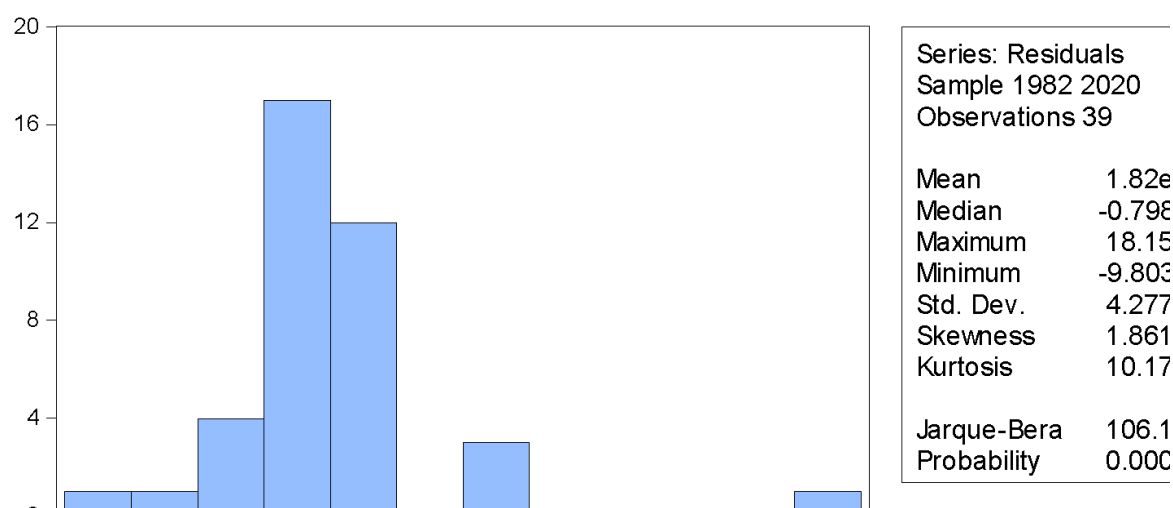
## Robustness Tests

### Autocorrelation Test

Breusch-Godfrey (BG) serial correlation LM test was carried out to evaluate the presence of autocorrelation problem in the model. The BG output reported in table 4.4 shows that the probability of Chi-Square ( $X^2$ ) yielded 0.4386. Since 0.4386 is greater than 0.05 ( $0.4386 > 0.05$ ), the null hypothesis of no serial correlation presence is accepted. Hence, there is no presence of serial correlation in the model.

### Normality Test (Jarque-Berra)

**Table 4.5**



Source: Author's Computation Using E-views 10

From the analysis extracted from table 4.5 above, it can be seen that Jarque-Berra yielded 106.1365 with a probability value of 0.000000. Since the probability value is less than 0.05, the null hypothesis, which states that the residuals are normally distributed is rejected. Hence, that residuals of the model do not follow normal distribution.

### Heteroscedasticity Test (Jarque-Berra)

**Table 4.6**

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.652533	Prob. F(6,32)	0.1651
Obs*R-squared	9.225599	Prob. Chi-Square(6)	0.1613
Scaled explained SS	28.48611	Prob. Chi-Square(6)	0.0001

Test Equation:



Dependent Variable: RESID^2

Method: Least Squares

Date: 01/01/24 Time: 07:29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.62916	9.172269	1.922006	0.0635
D(TOEDXP)	-0.161830	0.335190	-0.482800	0.6325
D(TOHEXP)	0.071410	0.433334	0.164792	0.8701
D(OOPE)	6.69E-05	0.001611	0.041491	0.9672
D(HDI)	853.7710	961.7250	0.887750	0.3813
D(INF)	-0.439294	0.535883	-0.819758	0.4184
ECM(-1)	-4.009359	1.345410	-2.980028	0.0055
R-squared	0.236554	Mean dependent var	17.82396	
Adjusted R-squared	0.093408	S.D. dependent var	54.68819	
S.E. of regression	52.07144	Akaike info criterion	10.90426	
Sum squared resid	86765.90	Schwarz criterion	11.20285	
Log likelihood	-205.6330	Hannan-Quinn criter.	11.01139	
F-statistic	1.652533	Durbin-Watson stat	1.668210	
Prob(F-statistic)	0.165084			

**Source:** *Author's Computation Using E-views 10*

From table 4.6, it can be clearly seen that the F-statistics of the heteroscedasticity output yielded 1.652533. This entails that the model is not homoscedastic. Hence, the variance is not constant over time

### Granger Causality Test

**Table 4.7**

Pairwise Granger Causality Tests

Date: 01/01/24 Time: 07:36

Sample: 1981 2022

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
TOEDXP does not Granger Cause POVR	38	0.44505	0.6446
POVR does not Granger Cause TOEDXP		0.37455	0.6905




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TOHEXP does not Granger Cause POVR	38	0.89656	0.4177
POVR does not Granger Cause TOHEXP		0.45559	0.6380

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**Source:** *Author's Computation Using E-views 10.*

From table 4.7, it can be clearly seen that there exists no causality relationship between the core variables. This is because none of the probability values associated with the causality output is less than 0.05. Hence, there is no causality relationship between human capital development and poverty reduction in Nigeria.

## SUMMARY, CONCLUSION AND RECOMMENDATIONS

### Summary of Findings

The primary focus of this study has been to empirically estimate the impact of human capital development on poverty reduction in Nigeria. Data for the study were extracted from the Central Bank of Nigeria (CBN) statistical bulletin and Worldbank Development Indicators (WDI) 2020. The analytical tool engaged in the study is the multiple regression technique. The major findings of the study are that:

1. Total education expenditures (TOEDXP) have positive and insignificant impact on poverty reduction in Nigeria.
2. Total health expenditures (TOHEXP) have positive and insignificant impact on poverty reduction in Nigeria.
3. Out of pocket expenditures (OOPE) have positive and insignificant impact on poverty reduction in Nigeria.

### Conclusion

This study has been able to empirically analyze the impact of human capital development on poverty reduction in Nigeria covering the period 1981-2020. Based on the analysis conducted, it was discovered that human capital development components contributed positively to poverty reduction but not significantly. The researcher therefore concludes that the magnitude of government expenditures to health and education is not sufficient enough to reduce poverty significantly. The study also concludes that out-of-pocket expenditures contribute to poverty in Nigeria.





## Recommendations

In the light of the above findings, the following recommendations were suggested:

1. The government should increase its expenditure on education as this would improve the standard of living of the citizens. Increased investment in education will help in promoting entrepreneurship as graduates will not solely depend on the government for jobs but will become job creators.
2. The government should also increase its expenditure on health. It is a fact that health is wealth and therefore there is the need to provide a good environment, health facilities, and increased rate of doctor to patient ratio, health workers motivation and increased remuneration amongst others.
3. From the analysis conducted, out of pocket health and education expenditures have a positive and insignificant impact on poverty reduction in Nigeria. The federal government can apply some key strategies to abolish education and user fees or charges in public schools and health facilities and exempt specific community groups such as the poor and the vulnerable, and pregnant women and children from official payments. They should also exempt some health services such as maternal and child care from official payments and deliver them free of charge.

## REFERENCES

- Adekoya, O. (2017). An examination of the effect of entrepreneurial capabilities on the prospects and challenges of setting up a small-scale business in Nigeria: A case study of Bank of Industry, Nigeria. *International Journal of Entrepreneurship, Innovation, and Management* 2(2), 55-67.
- Becker, G. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy* 70: 9-49.
- Ekpe, A.E (2011). Poverty alleviation in Nigeria through capitalism economic framework: problems and challenges. *Journal of Sustainable Development in Africa* 13(6), 181-192.
- Ogwumike, F.O & Ozughala, U. (2001). Growth, poverty and environment. The Nigerian economy society. Natural resource use, the environment and sustainable development. Kenbim Press Ltd, Ibadan.
- Mustaphas, M. (2011). Poverty alleviation as a machinery for economic reconstruction in Nigeria. *Nigerian Journal of Economic and Social Studies* 39 (2), 111-119
- Ogujiuba, K. (2013). The impact of human capital formation on economic growth in Nigeria. *Journal of Economics* 4(3), 121-132.
- World Bank Report (2013). Human capital index.
- Melio, M.S (2015). *The challenges of poverty measurement in the Arab Region*. International Association for Income and Wealth Conference.
- Kayode, A. (2012). Human capital development and poverty alleviation in Nigeria: A symbiotic overview. *Journal of Public Administration and Governance*, 7(1), 1-15.
- Harbison, F.H (2018). Human resources as the wealth of nations. Oxford University Press, New York, USA. 10. Schultz TW (1961) Investment in Human Capital. *The American Economic Review* 1(11), 1-17.



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- Ejere, S.I (2011). Human capital development as a catalyst for national development: Nigeria in perspective. *Journal of International Business & Management* 2(13) 98-104.
- Imam, H. (1998). Why poverty defines solution. *Business Times* Monday, p: 5.
- McCoston, M.K & Rewald, M. (2005). Conceptual overview of underlying causes of poverty. New York: Oxford University Press.
- Ijaiya GT (2007) Poverty alleviation programmes. In: Saliu H, Amali E, Olawepo R (eds.) *Nigeria's reform programme: Issues and Challenges*. Concept Publishing, Lagos.