

Human Capital Investment and Poverty Rate in Nigeria

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Abstract

This study examined the relationship between human capital investment and poverty rate in Nigeria. Human Capital Investment was proxied by capital expenditure on education, recurrent expenditure on education, capital expenditure on health, recurrent expenditure on health and tertiary enrolment, while poverty rate is measured using national poverty index. Relevant data were extracted from the annual Statistical Bulletin of the Central Bank of Nigeria. Unit root test was conducted using Augmented Dickey Fuller method which revealed that the variables were integrated at level and first difference necessitating the use of autoregressive distributive lag/bound test to explore the long run relationship existing among the variables in the model and the result showed that the variables were co-integrated; thus, depicting the presence of long run form. From the result of the various tests, it was revealed that there is a significant relationship between the proxies of human capital investment and poverty rate in Nigeria. The study consequently, concluded that human capital investment on education, health and tertiary enrolment significantly affects poverty rate in Nigeria. Based on the findings from the analysis, the study recommended amongst others, that; the government of should strive to increase investments in the areas of education and health so as to improve on the quality of education and healthcare facilities and as such, the quality of the human resources that could be instrumental to the achievement of desired economic growth, increasing the per capital income of citizens and reducing the poverty rate of the country; the reforms of the federal government of Nigeria relating to the education and health sectors of the economy as provided in the NEEDS document, should be sustained by the government with great commitment and will.

Keywords: Human Capital Investment, Education, Health, Tertiary Enrolment, Poverty Rate.

1. INTRODUCTION

The foremost macroeconomic objective of governments in virtually all countries is the achievement of rapid and sustainable economic growth with price stability. Consequently, the ultimate aim of macroeconomic policy is to increase the material welfare of the community (Iyoha, 2002; Vaish, 2002). The gaps in human capital investment rates between countries are very large. These gaps are most easily visible in the standard metrics used to assess human capital, such as school attendance rates and the highest grade completed among the working

age population. In recent times, economists have broadened the measures used to assess human capital investment to include test scores, as a measure of school quality, and health inputs and outcomes, as measures of the physical abilities of workers.

From the perspective of an individual country, the most interesting question is how much higher income would result from a given increase in human capital investment. As shown in Kraay (2018), the answer to this question in steady state is very simple: because the HCI measures worker productivity relative to the maximum, the increase in income per capita is proportional to the rise in the HCI. Thus, for example, a country that raised its Human Capital Investment from 0.5 to 0.75 would see a 50% increase in income per capita relative to what it would have been if human capital investment had remained constant. In addition, there is a follow-on effect from higher human capital investment, via the accumulation of physical capital, to higher output. This, too, takes time to fully play out. Assessing these effects thus requires a more elaborate dynamic model, as in Ashraf, Lester, and Weil (2008). Bringing this issue closer home, the best composite measure of the state of human development is perhaps UNDP's Human Development Index (HDI), which is widely utilized in its various Human Development Reports.

The overall trends in human development have been positive in some respects. Thus, life expectancy has increased from 40 to 51 years and infant mortality declined from 165 to 101 per 1000 births between 1960 and 1991. Likewise, there has been an increase in adult literacy from 28 to 51 per cent and in primary school enrolment between 1970 and 1990. And there has been an increase in the percentage of the population having access to safe water between 1975 and 1991. But these developments have not been of a magnitude enough to make an appreciable dent in Africa's formidable array of social problems.

Human capital is the most important asset to every human organization whether state, or institutions and it is usually a product of functional educational system (Christopher & Utpal, 2020). The capacity of human capital of a particular institution or state determines to a great extent the success of such outfit. Sustainable growth and development cannot be achieved in a fluke. It takes the continued empowerment of the human tools of the organization, to be able to initiate, implement and evaluate policies and programmes aimed at achieving developmental goals. In the developed countries, practical actions have shown their preference of human capital development to any other factor because of its relevance to growth and development. However, a country like Nigeria whose economic mainstay is export of crude oil, is continuously buffeted by the price volatility. Thus, growth and development cannot be in sight except a determined restructuring is embarked on.

Despite all the resources and efforts which have been expended on the development of Nigerian human capital by the government, it is sad to note that the country has not yet attained her desirable level of economic development. The question that often comes to mind is where are we not getting it right? Therefore, this study intends to examine the effect of human capital investment on Nigeria's economic development by critically examining the separate effects of capital and recurrent expenditures on education and health, and tertiary enrolment on the national poverty index from 1980-2020.

1.2 Objectives of the Study

The specific objectives include, to:

1. examine the effect of public education capital expenditure on the poverty rate of Nigeria;
2. examine the effect of public education recurrent expenditure on the poverty rate of Nigeria;
3. evaluate the effect of public health capital expenditure on the poverty rate of Nigeria;
4. evaluate the effect of public health recurrent expenditure on the poverty rate of Nigeria; and
5. determine the effect of tertiary education enrolment on the poverty rate of Nigeria.

1.3 Hypotheses

H₀₁: There is no significant relationship between public education capital expenditure and economic development of Nigeria.

H₀₂: There is no significant relationship between public education recurrent expenditure and economic development of Nigeria.

H₀₃: There is no significant relationship between public health capital expenditure and economic development of Nigeria.

H₀₄: There is no significant relationship between public health recurrent expenditure and economic development of Nigeria.

H₀₅: There is no significant relationship between tertiary education enrolment and economic development of Nigeria.

2. SYNOPSIS OF LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 Human Capital Investment

The concept of human capital refers to the abilities and skills of human resources of a country, while human capital development refers to the process of acquiring and increasing the number of persons who have the skills, education and experience that are critical for economic growth and development and economy (Okojie, 2005). Human capital consists of knowledge, skills or competencies and abilities of the workforce. Human beings are the only factor of production among others, that is capable of learning, adapting or changing, innovative and creative (Lyakurwa, 2007; Ejere, 2011). Human capital formation or development, according to Harbison (1973), is the deliberate and continuous process of acquiring requisite knowledge, skills and experiences that are applied to produce economic value for driving sustainable national development.

Human capital investment in education and health enhanced human capital development in developing countries like Nigeria. The critical elements of human capital development are predicated on investment in education and health sectors. Investment in education is the hung that create new skill, knowledge, and inducement which drive economic expansion through making individual more proficient and generate productive economy. Expenditure on education creates new technology, invention and innovation leading to wealth formation and human capital development. Health on the other hand mirrors a state of complete well-being which lead to competent work force and improve human capital development through acquisition of

skill and knowledge. Oluwakemi et al. (2018) stated that public expenditure on health, education, social community services, agriculture, transfer services and research and development accelerate human capital development in Nigeria. Edeme et al. (2017) noted that increase in public expenditure improves the level of human capital development. This led to the fact that advancement in human capital development led to healthier life and greater life expectancy.

The economic rationale for investing in human capital derives from the belief that human capital plays a key role in economic growth. According to Todaro and Smith (2003), human capital must be given direct attention in its own right, even in economies that are growing rapidly. This points to the fact that importance of this key concept centres not on just developing countries who wish to break free of their vicious cycle, but also developed countries that aspire to achieve sustainable growth and development.

2.1.2 Poverty Rate

Since the early 1900's, measurements of poverty have traditionally followed an economic approach based on income and consumption levels. Over the last decades social scientists have criticized this approach and have produced an impressive amount of work presenting alternative definitions and ways of measuring poverty (Otene & Richard, 2012). However, much of the poverty indicators used to this day are still imbedded in this income/consumption paradigm, while fieldwork undertaken so far on alternative indicators have been primarily carried out in rural areas. Poverty can be looked at in absolute or relative terms and using objective or subjective perspectives. Deprivations can be of a physiological nature or of a sociological nature. In any case the roots of poverty are situated in the "underlying structural inequities and inherent disadvantages" that are at work in any social make-up, and therefore is a socio-economic and political phenomenon (Akani, 2013).

There is therefore a need for these organizations of locally specific indicators to help them in their work, to identify where to concentrate their efforts and to monitor the results of such policies they would have chosen. Throughout history mankind has had to come up with words and concepts to represent poverty, and all societies have had to develop ways to come to term with it, accommodate it, or eventually control its social and economic consequences, by force if necessary. Concepts of poverty therefore reflect their times, and from the descriptive social approach of 19th century Europe we have moved, with the industrial revolution, the advent of capitalism and the rapid urbanization and proletarianization of the masses, towards a quantitative and economic focus (Ayadi, 2008).

The international and national agencies have long favoured the use of income poverty line to assess the extent of poverty. As these agencies somehow sit on top of the political hierarchy of the development arena, it is not surprising to see that the use of income-based poverty indicators still remains the best-publicized mean of assessing poverty (Auzairy, Fun, Ching, Li & Fung, 2017). The most general and abstract income-based indicator is certainly represented by the hegemony of the World Bank's \$1 per day per person poverty line. It is applied equally to all low- and middle-income nations, so that a town dweller in Rio or a peasant of rural Mali is equally defined as poor or not poor whether he/she is below or over this \$1 income per day threshold (Liew, Mansor & Pua, 2016). Income-based poverty lines are also applied within

countries and are extensively used by national governments to evaluate and monitor national incidence of poverty.

2.2 Theoretical Framework

2.2.1 The Human Development Index Literacy Theory

The Human Development Index Literacy (HDIL) theory was developed in 2011 (Biao, 2011). The theory was evolved as a result of the failure of past literacy efforts to yield a convincing correlation between literacy and development. The development of HDIL theory was based on the premises that:

- i). Development in the 21st century will become increasingly knowledge based
- ii). The minimal level of knowledge-bringing education available is basic literacy
- iii). With little or no capital, basic literacy may be promoted and rolled out
- iv). None of the four major theories of development since Adam Smith's *An inquiry into the nature and causes of the wealth of nations* (1776), made literacy a pivotal concept and instrument for socio-economic development. The HDIL theory of socio-economic development displays four main features. First, it is founded on the most basic of all education (literacy education). Second, to this literacy education is imputed specific socio-economic development criteria. Third, the implementation process of this literacy education includes the exploration and adoption of relevant indigenous knowledge and fourth, it is a literacy that promotes acquisition of knowledge from the public domain through the promotion of lifelong learning (for details, see Biao, 2011).

The concept of human capital formation refers to a conscious and continuous process of acquiring requisite knowledge, education, skills and experiences that are crucial for the rapid economic growth of a country (Harbinson, 1973; Salleh, 1992). It refers to the abilities and skills of the human resources of a country while its formation refers to the process of acquiring and increasing the number of persons who have the skills, education and experience which are critical for economic and political development of a country (Okojie, 1995). Human capital formation transcends mere acquisition of intellectual ability through formal education system. It is dynamic and multi-dimensional, including the family, the educational system, formal and informal institutions, special, professional and training organizations, enterprise in-house arrangement, and even personal efforts.

Harbinson and Myers (1973) defined human capital investment in economic terms as the accumulation of human capital and its effective investment in the development of an economy. According to them human resources can be developed in three ways.

1. By formal education, beginning from first level to secondary education and then to higher forms of education as in colleges and universities.
2. Through systematic or informal training programmes in employing institutions, in adult education programme and through membership in various political, social, religious, and cultural groups.
3. Through self-improvement efforts by reading or by learning from others in informal contact.

Schultz (1961) also identified five ways of developing human resources namely;

1. Broadly conceived investment in health facilities and services to include all expenditures that affect the life expectancy, strength and stamina and the vigor and vitality of the people.
2. On-the-job training, including old-type apprenticeships organized by firms
3. Formally organized education at the elementary, secondary and higher levels.
4. Study programme for adults that are not organized by firms including extension programmers notably in agriculture.
5. Migration of individuals and families to adjust to changing job opportunities.

From the above definitions, human capital investment can be looked at from various perspectives such as social, educational healthcare.

2.3 Empirical Literature

Nsanja, Kaluwa and Masanjala (2021) explored whether education sector foreign aid influences economic growth in Africa based on a panel of 32 countries over the period 2005-2017. The major novelty of the study is that on the supply side the major dependent variable, education aid flows, are disaggregated by education level. On the demand side, the recipient economies are accorded their income groups to account for capacities that complement the effects of human capital development on economic growth as well as the benevolent complementary or destabilizing effects of different political systems of government. The key findings are that: (i) education aid in aggregate form and primary education aid both enhance economic growth in low-income countries; (ii) in middle income countries higher education aid is more important for economic growth than primary and secondary education foreign aid; (iii) democracies have a stronger tendency to allocate more education sector foreign aid to primary education, while in autocracies the orientation is towards higher education. The findings imply that low-income autocracies that allocate more education sector foreign aid to higher education than to primary education do so at the expense of economic growth. The same applies to middle-income democracies whose allocation orientation is more towards primary education compared to higher education.

Hamdan, Sarea, Khamis, and Anasweh (2020) investigate the relationship between expenditure on higher education and economic development in Saudi Arabia. Saudi Arabia has invested in higher education and knowledge creation since its independence as part of the sustainable development process. Accordingly, this study aims at conducting an initial survey of the policies of expenditure on higher education in Saudi Arabia and then developing a standard model in which the results of this investment will be measured in achieving the economic development in Saudi Arabia for a period of forty years from (1978) until (2017). Based on econometric instruments; the study model did not succeed in finding a relationship between investment in higher education and economic development in Saudi Arabia.

Makwe, Akeeb and Ernest (2020) investigated the effect of human capital investment on economic growth in Nigeria within the periods 1981-2019. Time series data covering these periods of study were obtained and analyzed using Ordinary Least Square method. The data were further subjected to unit root test using the Augmented Dickey-Fuller (ADF) test, and a test of co-integration was performed using Johansen rank-based test. The result of the ADF test showed that the variables were all integrated at order one, and the Johansen co-integration test confirmed the existence of at least a co-integrating equation. The researchers went further in estimation an Error Correction Model (ECM) aimed at reconciling the short run deviations

from the long run equilibrium. The test results showed that capital and recurrent expenditures on education and health have not impacted significantly on the growth of the Nigerian economy both in the short run as well as the long run periods. Recommendations proffered include; government should intensify investments in education and health sectors in Nigeria to improve quality of services; government should embark on a general upgrade of the health sector in Nigeria as well as provision of adequate educational facilities in public schools.

Oluwatoyin (2020), study looked at human capital investment and economic growth in Nigeria – the role of education. Even though there are different perspectives to economic growth, there is a general consensus that growth will lead to a good change manifested in increased capacity of people to have control over material assets, intellectual resources and ideology, and obtain physical necessities of life like food, clothing, shelter, employment, etc. This is why some people have argued that the purpose of growth is to improve peoples' lives by expanding their choices, freedom and dignity. The belief in human capital as a necessity for growth started in Nigeria during the implementation of the 1955-60 Development Plan and today, with the importance of knowledge in the economy, human capital has increasingly attracted both academic and public interest. Their study made use of the Unit Root and Augmented Dickey Fuller (ADF) tests and found out that a positive relationship exists between government expenditure on education and economic growth while a negative relationship exists between government expenditure on health and economic growth. Therefore, based on these findings, the study recommended that the government should increase not just the amount of expenditure made on the education and health sectors, but also the percentage of its total expenditure accorded to these sectors. The ten percent benchmark proffered by the present national plan should be adopted.

Okezie (2020), looked at the benefits of human capital development and concluded that investing in same cannot be overemphasized as over the years, nations that have towed similar lines in recognizing the wealth that investing in human capital development brings have testified that its pros far outweighs its cons. Nigeria, being the largest African nation with a huge population within the work force range, is seen to be lacking in this sphere as a vast majority of its citizens have lived the mainstream life of mediocre and this solely springs from the fact that human capital development is at its lowest ebb.

Okang, et al., (2020) examined government capital expenditure and economic growth, using annual time series data for the period from 1972-2018. In view of the need to understand public expenditure on economic growth, the study sought to establish the relationship between capital expenditure and economic growth in Nigeria. The study employed the error correction mechanism (ECM) methodology in estimating the relevant equation. However, before the final result was estimated, the study has tested for unit root using the augmented Dickey-Fuller (ADF) test and Philips-Perron (PP) test. The study also tested for the long run equilibrium relationship among the variables using Johansen-Julius multivariate co-integration approach. The Granger causality test was also carried out to investigate the direction of causality between gross domestic product and the various components of government capital expenditure in Nigeria. The result of the co-integration test showed that the variables are co-integrated and hence there is a long run relationship among them. The granger causality test revealed that there was bi-directional relationship between gross domestic product and capital expenditure on social and community services, expenditure on administration, expenditure on economic

services and expenditure on transfers. The empirical results showed that previous one and two period values of gross domestic product have positive and significant impact on the current value of gross domestic product in Nigeria. The results also showed that public capital expenditures on administration have positive and significant impact on economic growth. Further examination of the results showed that capital expenditure on economic services has positive impact on economic growth in Nigeria. Meanwhile the results showed that capital expenditure on social and community services has positive impact on economic growth. Lastly, the results revealed that capital expenditure on transfer has negative relationship with economic growth. The study recommended that government should increase its spending in capital projects and also reduce expenditure on consumption in Nigeria.

Abraham and Ahmed (2020) argue that sustainable economic growth leads to economic development. This study examines the relationship between economic growth and development in the context of an error correction model. The approach is unique in that it provides evidence for the short and long run relationships between the variables and the direction and rate at which disequilibrium between the variables would be corrected over time. Gross Domestic Product (GDP) was used as a proxy for economic growth while the Human Development Index (HDI) was used as a proxy for human development. Irregular secondary data were collected from 1975 to 2008 from the Central Bank Statistical Bulletin, UNDP yearly Report and World Fact Book. Although the ECM showed that economic growth have a negative short run relationship with human development index, the result was not significant. The coefficient for the long run relationship was however significant. The study concludes that policies aimed at accelerating growth would have a negative impact on human development in the short run but in the long run, equilibrium will be restored by HDI adjusting to correct the equilibrium error. This implies that economic growth leads to human development and that macroeconomic policies aimed at achieving sustainable economic growth should be maintained.

3. METHODOLOGY

3.1 Research Design

The research design for this study was based on the use of time-series data in the analysis. Therefore, the study adopted the quasi-experimental research design in determining the structural relationship existing between human capital investment and gross domestic product in Nigeria. Quasi-experimental design is also referred to as survey. The quasi-experimental designs are widely used in administrative and social sciences research because of the complex relationship that exists between variables, as such relationship is not subject to manipulation. Therefore, the choice of quasi-experimental research design (particularly the ex-post factor analysis) is premised on the fact that the research variables could not be subjected to controlled laboratory tests which made the experimental design option not suitable for this study.

3.2 Nature and Sources of Data

The major source of data used in this study was the secondary source. Thus, the data for this research analysis was obtained from various issues of the Central Bank of Nigeria Statistical Bulletin, the National Bureau of Statistics Summary of Abstract (1980 to 2020) and the United Nations Development Programme Reports. These data covered information on Human Capital Investment in Education, Human Capital Investment in Health and tertiary enrolment statistics

...serving as the dimensions of Human Capital Investment, and the values of the Gross Domestic Product for the periods under investigation.

3.3 Model Specification

This study adopted and modified the model of Makwe, Akeeb and Enerst (2020), who investigated the relationship between human capital investments and economic growth using the Ordinary least squares model. They stated their model as thus: $RGDP_t = f(CEE_t, REE_t, CEH_t, REH_t)$. Further, these models were anchored on the theory of human capital development. The theory clearly captures the essence of this study.

3.3.1 Poverty Index Model

Nigeria's development model is stated below in its functional form:

$$\text{Model I: } RGDP_t = f(CEE_t, REE_t, CEH_t, REH_t, TER_t) \dots\dots\dots(1)$$

This is further stated in econometric form below:

$$NPI_t = \beta_0 + \beta_1 CEE_t + \beta_2 REE_t + \beta_3 CEH_t + \beta_4 REH_t + \beta_5 TER_t + U_i$$

Where:

- NPI = National Poverty Index
- CEE = Capital Expenditure on Education
- REE = Recurrent Expenditure on Education
- CEH = Capital Expenditure on Health
- REH = Recurrent Expenditure on Health
- TER = Tertiary Enrolment
- β_0 = The slope (intercept) of the function

Check Variables

Check variables were introduced to reduce the possibility of having spurious results from the models. The check variables used are:

- INF = Inflation
- POPG = Population growth
- β_1 = coefficient (slope) of capital expenditure on Education
- β_2 = coefficient (slope) of recurrent expenditure on Education
- β_3 = Coefficient (slope) of capital expenditure on health
- β_4 = Coefficient (slope) of recurrent expenditure on health
- β_5 = Coefficient (slope) of tertiary enrolment
- u = stochastic term
- t = unit of time.

3.4 Methods of Data Analysis

This study adopted the econometric technique. According to Theil (1971), cited in Gujarati and Sangeetha (2007), econometrics is concerned with the empirical determination of economic laws. It is a combination of economic theory, mathematical economics and statistics, but is completely distinguished from each of these three branches of science (Koutsoyianis, 1977).

For the purpose of our analysis here, the Autoregressive Distributive Lag (ARDL)/bond test approach developed by Peseran et al (2001) were adopted as our data sets consisted of variables integrating both at level (0) and at first difference (order I).

The Autoregressive Distributive Lag (ARDL)/bond test approach were used to establish a long run relationship between the variables in each model. This approach was adopted at this instance because it is suitable for use with a mixture of variables integrated at level I (0), variables integrated at first difference I (1) or variables that are fractionally integrated (see Peseran et al, 2001).

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics of the study Variables

Table 4.1: NPI Model

	LOG(NPI)	LOG(CEE)	LOG(CEH)	LOG(REH)	LOG(REE)	LOG(TRE)
Mean	11.63177	54426.91	22.40296	7316.222	1016.118	6366.118
Median	62.17640	6211.904	21.88320	1488.993	2637.913	2637.901
Maximum	115.2053	9847.821	36.18340	9123.522	17680.52	17420.52
Minimum	4.209290	22.04129	18.76340	731.9902	52.85702	52.85702
Std. Dev.	51.22341	7833.972	4.053449	6203.711	6490.706	6110.706
Skewness	0.216826	0.334214	1.722320	0.403221	0.447171	0.084571
Kurtosis	1.564333	1.091091	5.093428	1.400773	1.478887	1.453297
Jarque-Bera	2.227640	3.963058	25.76457	4.49045	4.021775	6.985475
Probability	0.243536	0.137858	0.083313	0.30430	0.133870	0.197440
Sum	2986.221	70248.81	697.2235	120844.9	197664.9	198474.9
Sum Sq. Dev.	154237.5	1.377848	138.3343	1.809422	1.119849	1.109849
Observations	40	40	40	40	40	40

Source: Authors Computation.

From the above table, the mean values are 11.6, 5442.9, 22.4, 7316.2, 1016.1 and 6366.1 for national poverty index, capital expenditure on education, capital expenditure on health, recurrent expenditure on health, recurrent expenditure on education and tertiary enrolment respectively. From these, the data suggests that capital expenditure on health is the least relative to national poverty index and recurrent expenditure on health is the most relative to national poverty index.

The standard deviation showed that capital expenditure on health (CEH) has a smaller spread relative to capital expenditure on education, recurrent expenditure on education, recurrent expenditure on health and tertiary enrolment used in this study, while capital expenditure on education (CEE) has the largest spread. The standard deviation for national poverty index (NIP) stood at 51.2.

The table also shows that recurrent expenditure on education had the highest inflow in relation to capital expenditure on education, recurrent expenditure on health and capital expenditure on health tertiary enrolment. The capital expenditure on health had its highest/maximum as 36.18% which is far below capital expenditure on education, recurrent expenditure on education, recurrent expenditure on health and tertiary enrolment that recorded 9847.8, 17680.5, 9123.5 and 17420.5 respectively. This suggests that the capital projects in the health sector receive very little attention from the federal government. Furthermore, the minimum for recurrent expenditure on health stood at 731.99% which was greater than the minimum for recurrent expenditure on education, capital expenditure on education, capital expenditure on health and tertiary enrolment. This implies that recurrent expenditure on health is much more stable than government expenditures to other sectors included in this study.

The national poverty index recorded 115.2 as its maximum value and 4.21% as its minimum value. The table further reveal that all the data for the respective variables have a positive tail. This is evidenced by their skewness coefficients. The Jarque-Bera test statistics which compares the difference between the skewness and kurtosis calculated with that of normal distribution shows that all variables are not normally distributed given their respective probability values.

4.1.1 Unit Root Tests

The unit root tests test for the stationarity of the variables used. Any issue of none stationarity of any variable is corrected before being used for the analysis. This is to avoid spurious regression results in case the variables are not stationarity.

Table 4.2 Unit Root Test Result

Coefficient	At levels (Prob)	First (Prob)	Difference	Stationarity
LOG(CEE)	0.8251	0.0000		I(0) at first diff
LOG(REE)	0.1985	0.0000		I(0) at first diff
LOG(CEH)	0.7918	0.0000		I(0) at first diff
LOG(REH)	0.4548	0.0000		I(0) at first diff
LOG(TER)	0.5367	0.0000		I(0) at first diff
NPI	0.3076	0.0000		I(0) at first diff
INF	0.0479	0.0016		I(0) at levels
POPG	0.0002	0.0408		I(0) at levels

Source: Author's computation using EViews.

The table shows that the variables have mixed results of stationarity at levels and first difference using the ADF unit root tests. This meets the required condition to use the ARDL method of analysis in testing the hypotheses of the analysis.

4.1.2 Bounds Tests for Cointegration

The bounds tests for cointegration test whether there is a long-term relationship between the variables used in the model. As shown below, the result of the model shows that there is a long-term relationship between the dependent and the independent variables. This is confirmed with the f-stat which is higher than the lower and upper bounds of the results.

Table 4.3: NPI

F-statistic	12.53414	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

Source: Eviews

4.1.3 ARDL ECM Tests

Table 4.4: NPI ECM

ECM Regression					
Case 3: Unrestricted Constant and No Trend					
Variable	Coefficien	t	Std. Error	t-Statistic	Prob.
C	28.71564	2.894534	9.920645	0.0000	
DLOG(NPI(-1))	0.162646	0.142141	1.144256	0.2901	
DLOG(NPI(-2))	0.521006	0.165093	3.155838	0.0160	
DLOG(NPI(-3))	0.316448	0.081634	3.876450	0.0061	
DLOG(CEE)	0.257739	0.104233	2.472715	0.0427	
DLOG(CEE(-1))	1.190967	0.247069	4.820388	0.0019	
DLOG(CEE(-2))	0.137019	0.118867	1.152713	0.2869	
DLOG(CEE(-3))	0.520610	0.115588	4.503995	0.0028	
DLOG(REE)	0.627464	0.123706	5.072229	0.0014	
DLOG(REE(-1))	0.411633	0.181836	2.263756	0.0580	
DLOG(REE(-2))	0.584623	0.244437	2.391707	0.0480	
DLOG(CEH)	0.472286	0.199193	2.370997	0.0495	
DLOG(CEH(-1))	-0.865079	0.222468	-3.888550	0.0060	
DLOG(REH)	-0.774127	0.171380	-4.517030	0.0027	
DLOG(REH(-1))	-1.028986	0.184055	-5.590658	0.0008	
DLOG(TRE)	-0.862870	0.214983	-4.013671	0.0051	
DLOG(TRE(-1))	-0.404753	0.069758	-5.802248	0.0007	
INF	-0.009839	0.003636	-2.705842	0.0304	
POPG	-3.419824	0.775827	-4.407971	0.0031	
CointEq(-1)*	-0.955788	0.126543	-9.923836	0.0000	
R-squared	0.982443	Mean dependent var	0.072967		
Adjusted R-squared	0.952118	S.D. dependent var	0.703903		
S.E. of regression	0.154028	Akaike info criterion	0.649133		
Sum squared resid	0.260971	Schwarz criterion	0.276020		
Log likelihood	30.06157	Hannan-Quinn criter.	0.347557		
F-statistic	32.39669	Durbin-Watson stat	2.457342		
Prob(F-statistic)	0.000000				

Source: Eviews Version 10

The model result of the analysis shows that the goodness-of-fit (R-Square) is 0.85. This means that 85% of the changes in the dependent variable is explained by the changes in the independent variables. 15% is taken care of by the stockastic term (all other variables that affect the dependent variable but were not included in the model). The annual speed of adjustment is 43%. The model is statistically significant when taken together based on the f-stat 5.33.

4.1.4 Post Estimation Test Results

Serial Correlation Tests

Table 4.5: NPI Model

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.321248	Prob. F(2,5)	0.3462
Obs*R-squared	10.71867	Prob. Chi-Square(2)	0.0047

Sources: Eviews 10

Serial Correlation analysis shows how much a variable affects itself over the period of study. The effect will result to spurious result from the regression analysis. The results of the analysis show that the models do not have problem of serial correlation of the first order.

4.1.5 Heteroskedasticity Tests

Table 4.6: NPI Model

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.798327	Prob. F(23,7)	0.6839
Obs*R-squared	22.44373	Prob. Chi-Square(23)	0.4936
Scaled explained SS	1.548440	Prob. Chi-Square(23)	1.0000

Sources: Eview 10

Heteroskedasticity Tests test for the consistency of the variance of the models. Constant variance (homoskedasticity) is ideal for analysis. If the time series data used is found to be heteroskedastic, the results will be spurious.

The results of the model above, using F-stat probability, show that the model is heteroskedastic free and therefore, suitable for the required analysis.

4.2 Tests of Hypotheses

H₁: *There is no relationship between National Poverty Index and Capital Expenditure on Education.*

The result of the analysis using the ECM shows that National Poverty Index is positively related to Capital Expenditure on Education. As Capital Expenditure on Education increases by a unit, National Poverty Index increases by 0.25 and vice versa. Capital Expenditure on Education is shown to be statistically significant using the t-stat based on 5% confidence level. We will therefore reject the null hypothesis, accept the alternative and conclude that there is a significant relationship between National Poverty Index and Capital Expenditure on Education over the period of study.

H₂: *There is no relationship between National Poverty Index and Recurrent Expenditure on Education.*

The result of the analysis using the ECM shows that National Poverty Index is positively related to Recurrent Expenditure on Education. As Recurrent Expenditure on Education increases by a unit, National Poverty Index increases by 0.62 and vice versa. Recurrent Expenditure on Education is shown to be statistically significant using the t-stat probability at 5% confidence level. We will therefore reject the null hypothesis, accept the alternative and conclude that there is a significant relationship between National Poverty Index and Recurrent Expenditure on Education over the period of study.

H₃: *There is no relationship between National Poverty Index and Capital Expenditure on Health*

The result also shows that there is a positive relationship between National Poverty Index and Capital Expenditure on Health. The analysis reveals that as Capital Expenditure on Health increases by a unit, National Poverty Index increases by 0.47 and vice versa. Capital Expenditure on Health is statistically significant using the t-stat based on 5% confidence level. We will therefore reject the null hypothesis, accept the alternative and conclude that there is a significant relationship between the National Poverty Index and Capital Expenditure on Health over the period of study.

H₄: *There is no relationship between National Poverty Index and Recurrent Expenditure on Health.*

The result also shows that there is a negative relationship between National Poverty Index and Recurrent Expenditure on Health. The analysis reveals that as Recurrent Expenditure on Health increases by a unit, National Poverty Index decreases by -1.02 and vice versa. Recurrent Expenditure on Health is statistically significant using the t-stat based on 5% confidence level. We will therefore reject the null hypothesis, accept the alternative and conclude that there is a significant relationship between the National Poverty Index and Recurrent Expenditure on Health over the period of study.

H₅: *There is no relationship between National Poverty Index and Tertiary Enrolment.*

The result also shows that there is a positive relationship between National Poverty Index and Tertiary Enrolment. The analysis reveals that as Tertiary Enrolment increases by a unit, National Poverty Index increases by 0.096858 and vice versa. Tertiary Enrolment is statistically significant using the t-stat based on 5% confidence level. We will therefore reject the null hypothesis, accept the alternative and conclude that there is a significant relationship between the National Poverty Index and Tertiary Enrolment over the period of study.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study examined the effects of human capital investment on poverty rate in Nigeria over the period of 40 years (1980 to 2020). It explored the trends of Capital Expenditure on Education (CEE), Recurrent Expenditure on Education (REE), Capital expenditure on Health (CEE), Recurrent Expenditure on Health (REH) and Tertiary Enrolment (TER) over the period and their impacts on the poverty rate of Nigeria. The researcher used the ARDL model of analysis to analyze the data collected.

Also, the unit root test, serial autocorrelation test, normality tests, heteroscedasticity tests, and CUSUM were analyzed in the model presented. Based on the analysis and the hypotheses tested, the major findings of the study are summarized as follows:

- i) There is a significant relationship between capital expenditure on education and the poverty rate of Nigeria over the period of study.
- ii) There is a significant relationship between recurrent expenditure on education and the poverty rate of Nigeria over the study period.
- iii) There is a significant relationship between capital expenditure on health and the poverty rate of Nigeria over the period of study.
- iv) There is a significant relationship between recurrent expenditure on education and the poverty rate of Nigeria over the study period.
- v) There is a significant relationship between tertiary enrolment and the poverty rate of Nigeria over the study period.

5.2 Recommendations

- (a) The government of Nigeria is advised to increase her investments in the areas of education and health so as to improve on the quality of education and health care facilities and as such, the quality of the human resources that could be instrumental to the achievement of desired economic growth and a reduction in the poverty index of Nigeria.
- (b) There is an urgent need for appropriate authorities to shift their current emphasis from the development of building only structures, to the building of people's capacities through the restoration and uplifting of our educational standards by implementing the 25 percent recommended annual budgets to education by UNESCO. This will be instrumental to a reduction in the poverty rate in Nigeria.
- (c) The Government should embark on a general upgrade of the health sector. There is need for a sustained development of infrastructural facilities in this sector. World class public hospitals, equipment's etc should be provided to cushion the effect of seeking medical services abroad, on the economy. A corresponding percentage of budgetary allocation recommended by the world health organization should be committed to the health sector as these will reduce the poverty rate in the country.
- (d) The Nigerian government should continually provide the enabling environment required to guarantee macroeconomic stability, consistency and continuity in policy implementation and the creation of a positive international image that can encourage increased investment in human capital not only by the government, but also by individuals and private bodies.

- (e) The reforms of the federal government of Nigeria relating to the education and health sectors of the economy as provided in the NEEDS document, should be sustained by the government with great commitment and will.
- (f) It is also important that the government pay more attention to the development and standardization of tertiary institutions in Nigeria, especially those within the public domain as the quality of output that comes out of these institutions have the potentials to bring about a reduction in the poverty rate in Nigeria.

5.3 Contributions to Knowledge

- i. This research has positively developed and explored the model that created a link between the proxies of human capital Investment and poverty rate. This model has made it very easy to explain the direction of relationships between these variables which has added to the knowledge stock in this area of study.
- ii. This study, unlike several other studies in literature, has been able to isolate the capital and recurrent expenditures on education and health (as proxies of human capital investment), so as to analyze and examine their individual impacts on poverty rate in Nigeria.
- iii. Also, the gap identified in literature particularly the limited study in the area of human capital investment and poverty rate and the time frame covered has been addressed as this study was based on selected critical dimensions of human capital investment and also covered the period between 1980 to 2020. It is equally vital to state that this findings and position of the researchers in this study could serve as a point of departure to future researchers who may wish to follow the same line in their researcher endeavour.

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