Original Research Article

POVERTY MENACE AND SOCIAL ECONOMIC NEXUS IN NIGERIA: A BOUND TEST APPROACH

ABSTRACT

Nigeria has recorded variations in major macroeconomic variables since independence. Growth episodes over the years though encouraging put has not translated to improvement in poverty incidence. The rate of poverty in the nation has out-grown population growth, hence, this study seeks to relate various sectors of the economy to the perturbing poverty level in the nation with emphasis on the social sectors in which health and education play integral roles. This study examines poverty and social economic mix in Nigeria with the objectives of ascertaining the partial impacts of productivity (as a measure of health outcome), public social expenditures, agricultural output, manufacturing output and infrastructural development on poverty incidence, the study collected secondary annual time series data spanning 37 years from 1981 to 2017 on poverty index (PVTI), productivity due to good health (HP) and other explanatory variables as earlier identified. The pre-estimation techniques adopted include descriptive statistics, Phillips-Perron stationarity test and bounds test to co-integration. The preliminary result reveals that the variables in the model have long run relationship. The parameters of the model were estimated using the ARDL technique and the study found that productivity due to good health (HP) has significant effect on poverty reduction, as public social expenditures, current period's agricultural output and previous period manufacturing output have similar effects but not statistically significant, however, infrastructural development and current manufacturing output have significant positive impact on poverty incidence in the country. On the basis of our empirical revelation, the study recommends that government should adopt multi-sectoral and big push development approaches with priority on employees' productivity through free health care programmes for the unemployed, quality health insurance scheme for the employed, free education for children of the poor and unemployed, and that investment in critical infrastructures such as roads, rail, energy and storage facilities that promote agriculture and manufacturing outputs be improved upon if poverty is to be decisively tackled in Nigeria..

Key Words: Poverty and Health, Bounds Test

1.0 INTRODUCTION

Nigeria has undergone enormous social and economic changes since independence in 1960, including economic downturn, rapid inflation, civil war, major population displacements (due to Boko Haram insurgency, floods, herders/farmers conflicts) and comprehensive deterioration in public utilities such as educational and health services and infrastructures. Despite impressive economic growth and stabilization witnessed in the decades preceding 2016, with annual economic growth rate of 12.8% in 1990, 7.61% in 1996, 10.35% in 2003, 7.84% in 2010 and 6.31% in 2014, though in 2016 growth rate was -1.62% accompanied by weak recovery of 0.8% growth rate in 2017 [1]. Nigeria today has the largest number of poor people in the world with over 86 million of her citizenry living below the national poverty line of $1.25 per day, that is, over half of her population wallowing in abject poverty [2]. This is corroborated by the classification of Nigeria amongst the lowest-income nations with GDP per capita of $2,175.67 in 2016, which is low when compared with other developing countries in the world. In 2017, the poverty survey by the National Bureau of Statistics subsequently NBS show that over 70 percent of Nigerians are living on less than a dollar a day, compared with 52 percent in 2004 [3]. This is

corroborated by the [2] ranking of Nigeria as the poorest country in the world as compared with 2001 ranking from 28th position. Obvious in the face of rising poverty incidence is an accelerated contraction in the size of the middle income class. Statistical evidence show that the gap between the haves and have-not has continued to widen as depicted by the gini coefficient which stood at 38.68 percent in 1986, rose to 44.95 percent in 1992, worsen further to 46.50 percent in 1996, and in 2010 it stood at 48.83 percent, in recent years, the gini coefficient has increased above 52 percent [1]. Within the same discussion, in 1996 the richest 10 percent of Nigerians controlled about 28 percent of the nation's resources, the lowest 10 percent controlled a meager of 2.47 percent within the same period, subsequently from available data, it is obvious that the gap has continued to drift widely apart. This is shown in 1992 when richest 10 percent controlled 31.53 percent of resources as the poorest 10 percent managed to control 1.42 percent. While the former control over 40 percent in recent years, the latter control less than 2 percent.

Despite the impressive economic growth episodes in recent past years as earlier documented, poverty in Nigeria has had a substantially significant effect on the health of Nigerians. This is obvious in the wide perception of declining livelihoods and basic public social services of which health and education are core. A meticulous inquiry reveals that health indicators are heading south as poverty incidence heads north in the country.

Using global spectacles, notable improvements in absolute poverty by over 1 billion people through the MDGs/SDGs [4], vital statistics reveal between 2000 and 2015, the global maternal mortality ratio, (number of maternal deaths per 100,000 live births) declined by 37 per cent, to an estimated ratio of 216 per 100,000 live births in 2015, almost all maternal deaths occur in less developed countries. In addition, 3 out of 4 births were attended by skilled health-care personnel in 2015. However, an estimated 5.9 million children under the age of 5 died in 2015, with a global under-five mortality rate of 43 per 1,000 live births. The neonatal mortality rate, that is, the likelihood of dying in the first 28 days of life, declined from 31 deaths per 1,000 live births in 2000 to 19 deaths per 1,000 live births in 2015. Over that period, progress in the rate of child survival among children aged 1 to 59 months surpasses efforts in reducing neonatal mortality; as a result, neonatal deaths now represent a larger share (45 per cent) of all under-five deaths [4]. The incidence of HIV was highest in sub-Saharan Africa, with 1.5 new cases per 1,000 uninfected people. In 2014, 9.6 million new incidence of tuberculosis (133 cases per 100,000 people) were reported globally. About 50 per cent of the world's population is at risk of malaria and, in 2015, Sub-Saharan Africa accounted for 89 per cent of all malaria cases worldwide, with an incidence rate of 235 cases per 1,000 people at risk. In 2014, at least 1.7 billion people, in 185 countries, required treatment for at least one neglected tropical disease. As cited in [7] Nigerian mortality rate was 25.68 in 1960, a decade later, it declined marginally to 25.54, and the downward trend continued till 1990 when the nation recorded 24.42 which is the all time low. From 2000 to 2010, the trend reversed, with mortality rate of 26.40 and 30.48 respectively, and reaching 31.83 in 2015. These observed upward trends in recent times can be attributed to insecurity challenges, poverty and high cost of healthcare. Furthermore, lives in Nigeria have remained short, brutish, nasty and miserable with HIV/AIDS prevalence, communicable and

non-communicable diseases and life style related illnesses like cancer and hepatitis. Hitherto, life expectancy at birth which stood at 50 years in 2008 has declined to 47 years in 2016 [6]. The performance of the health sector has remained insignificant, contributing 1.7% to GDP in 1998, 1.8% in 2008, 3.8% in 2012 and less than 2% in 2016 (NBS, 2017). These figures are relatively high when compared with other developing nations, and poses a threat to good health with the possibility of perpetuating poverty.

From the forging, this study seeks to examine the relationship between poverty and social economic determinants in Nigeria with the major objective of ascertaining if a long run equilibrium relationship exists between Poverty and social economic determinants. Other objectives are to determine the partial effects of public social expenditure (PSE- Health and Education), performance of real sectors of the economy (Agriculture and Manufacturing) and infrastructural development (INFRAD) on Poverty incidence in Nigeria. Though a flurry of literature exists on Poverty and Social indicators, specifically, [8] examined the causality between both phenomena by adopting life expectancy as health indicator. The use of life expectancy does not truly reflect healthy and productive living. To close this gap in literature, this study adopts labour productivity i.e GDP/employee as indicator of productive and healthy living. Other studies on poverty in recent era have focused more on inequality and economic growth [9], [8] and [3] with mixed submissions. Thus, while [8] documents the absence of a direct causal relationship between poverty and health indicators, within the same discussion, [3] reports a significant relationship between health indicators and poverty incidence in Nigeria, thus corroborating previous evidence from [9] with the submission that social resources have direct significant effects on poverty reduction in the country, thus a sharp departure from [8]. Again, popular among previous studies is the OLS estimation technique which is bedeviled by several realities, to improve on previous studies in terms of methods of analyses, we adopt modern econometric technique like the Bound co-integration test, and ARDL estimation technique. These obvious vacuums in literature form the fulcrum of this study. The contributions of this study to the poverty and social relations debate have profound policy implications especially with the incorporation of the social and real sectors of the economy which to the best of our knowledge were not jointly modeled as determinants of poverty by previous studies

This study is structured in five sections, following this introductory sector is literature review where facts were stylized, theories of poverty and health reviewed, and relevant empirical literature reviewed. Section three contains methodology of the study with model specification and analytical framework. Section four focuses on data analyses and discussion of empirical results while section five concludes the study with summary of findings and relevant policy implications.

GOVERNMENT POLICIES ON SOCIAL SECTOR AND STYLIZED FACTS

2.1 Nigerian Programmes for Poverty Eradication

This study views poverty eradication programmes as part of every administration's strategy to endear itself the people in the face of rising poverty incidences. These programmes are often implemented through Ministries, Agencies and Departments (MDAs), and partnership with NGOs, and International Financial Organisations. A list of various poverty eradication programmes is presented below. It is outside the scope of this paper to discuss these programmes in details.

- The National Directorate of Employment (NDE)
- Peoples Bank of Nigeria (PBN)
- Nigerian Agricultural and Cooperative Bank Ltd (NACB)
- Nigerian Agricultural Insurance Corporation (NAIC)
- National Commission for Nomadic Education (NCNE)
- National Primary Healthcare Development Agency (NPHDA)
- National Agricultural Land Development Authority (NALDA)
- National Commission for Mass Literacy, Adult and Non-Formal Education
- Federal Agricultural Coordinating Unit (FACU)
- Directorate for Food, Roads and Rural Infrastructures (DFRRI)
- Agricultural Projects Monitoring and Evaluation Unit (APMEU)
- Family Economic Advancement Programme (FEAP)
- Industrial Development Centre (IDC)
- Federal Department of Rural Development (FDRD)
- Federal Ministry of Agriculture, Water Resources and Power and Steel
- River Basin Development Authorities (RBDAs)
- Family Support Trust Fund (FSTF)
- National Centre for Women Development (CWD)
- Nigerian Industrial Development Bank (NIDB)
- Nigerian Import-Export Bank
- Nigerian Bank for Commerce and Industry (NBCI)
- Nigerian Economic Reconstruction Fund (NERF)
- Green Revolution (GR)
- Operation Feed the Nation (OFN)
- National Empowerment for Economic and Development Strategy (NEEDS)

- National Poverty Eradication Programme (NAPEP)
- Poverty Alleviation Programme (PAP).
- Youth With Innovation Programme (YouWin)
- Subsidy Reinvestment Programme (SURE-P)
- Conditional Cash Transfer Programme
- School Feeding Programme
- N-POWER Programme

The core targets of these programmes were and still remain poverty eradication via job creation, quality education, youth empowerment through agriculture, quality health care, and access to credit by small scale entrepreneurs among others, which directly or indirectly causes poverty reduction.

Despite these numerous programmes and the associated strategies, poverty rate has continued to worsen. The obvious reasons are the political nature of these programmes, insincerity in governance which breed corruption, policy inconsistencies due to frequent change of government and lack of political will to implement the programmes, again, poor consultation with the masses and exclusion of the peripheral from national poverty eradication programmes.

2.2. POVERTY

A meticulous perusal of literature reveals that there is a plethora of conceptualization of poverty. [10] Posits that poverty is simply a humiliating dependence and a state of deprivation, which implies that poverty, is lack of basic necessities of life coupled with the inability to satisfy the basic requirements of human survival. Furthermore, poverty is seen as inadequate satisfaction of basic needs of life. This definition buttresses previous definitions. However, poverty is the lack of multiple resources that lead to hunger and physical deprivation. Such necessary materials include purchasing and consumption power, availability and access to quality **healthcare** and **education** amongst others.

2.2.2 PROFILING POVERTY IN NIGERIA

Statistics show that Nigeria poverty incidence in Nigeria is on a large scale with Nigeria rated as having largest number of poor citizens in the world. Following various reports but with more attention to [2] and [5], in 1994, poverty rate stood at 43%, 54.7% in 2004, but increased to 60.9% in 2010, 69.9%, 71.4% and 74.6% in 2013, 2015 and 2017 respectively. Geo-politically, the North-West and North-East zones record the highest poverty rates in the country with 77.7 percent and 76.3 percent respectively in 2010, while the South-West geo-political zone records the lowest at 59.1 percent. Among States, Sokoto had the highest poverty rate at 86.4 percent while Niger had the lowest at 43.6 percent in the year [5]. A comparative analysis reveals that

Bayelsa state has the least poverty incidence lies below the leading areas in Ghana, Cameroon, and South Africa.

Figure 2.1: Relative Poverty Headcount in Nigeria (1980-2010)

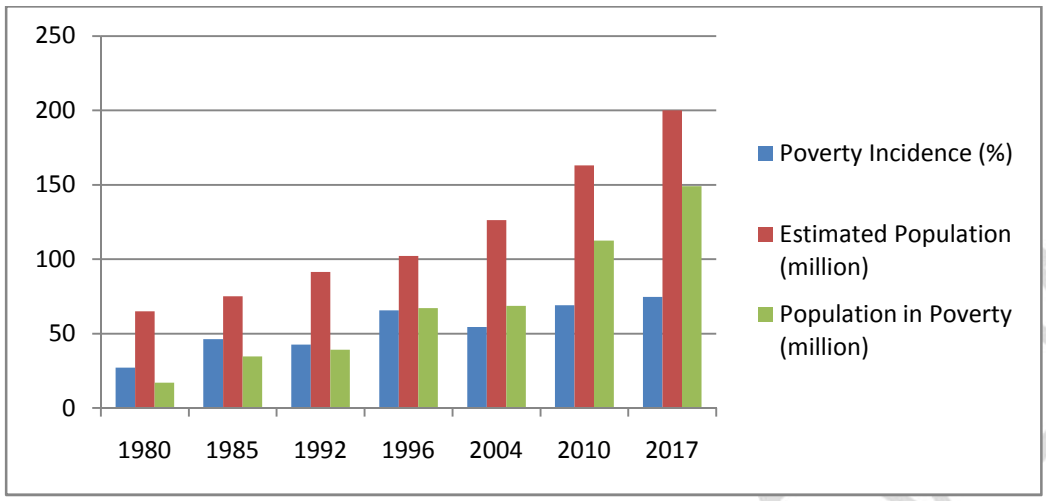
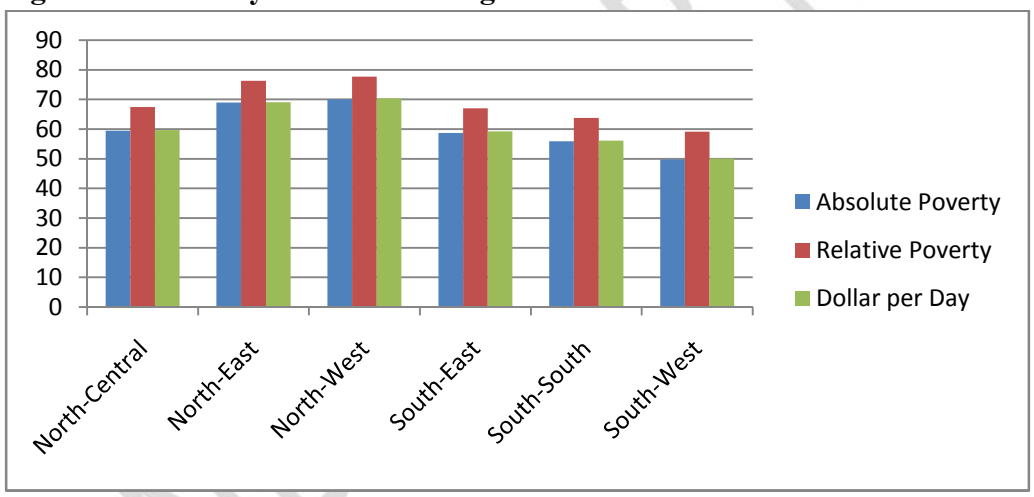


Figure 2.2: Poverty Incidence in Nigeria: Geo-Political Zones



Source: Author's computation using NBS data

Table 2.1: MPI Index and Other Poverty Parameters for Selected African Nations

Country	MPI% of people who are poor	Average Intensity of MPI Poverty	Percentage Number of People living on less than $1 a day.	Percentage Number of People living on less than $2 a day
Angola	0.452	77.4	54.3	70.2
Burkina Faso	0.536	71.8	47.3	75.3
Cameroun	0.287	53.3	9.6	30.4
Cote'diovre	0.353	61.5	23.8	46.3
Egypt	0.024	6.0	2.0	18.5
Gabon	0.161	35.4	4.8	19.6

Ghana	0.144	31.2	30.0	53.6
Guinea	0.506	82.5	43.3	69.6
Kenya	0.229	47.8	19.7	39.3
Liberia	0.485	83.9	83.7	94.8
Mali	0.558	86.6	51.4	77.1
Morocco	0.048	10.6	2.5	14.0
Namibia	0.187	39.6	49.1	67.2
Niger	0.642	92.4	43.1	75.9
Nigeria	***0.310***	***54.1***	***64.4***	***83.9***
Rwanda	0.426	80.2	76.8	89.6
South Africa	0.057	13.4	17.4	35.7
Swailizand	0.184	41.4	62.9	81.0
Tunisia	0.010	2.8	2.6	12.8
Togo	0.284	54.2	38.7	69.3
Uganda	0.367	72.3	37.7	64.5

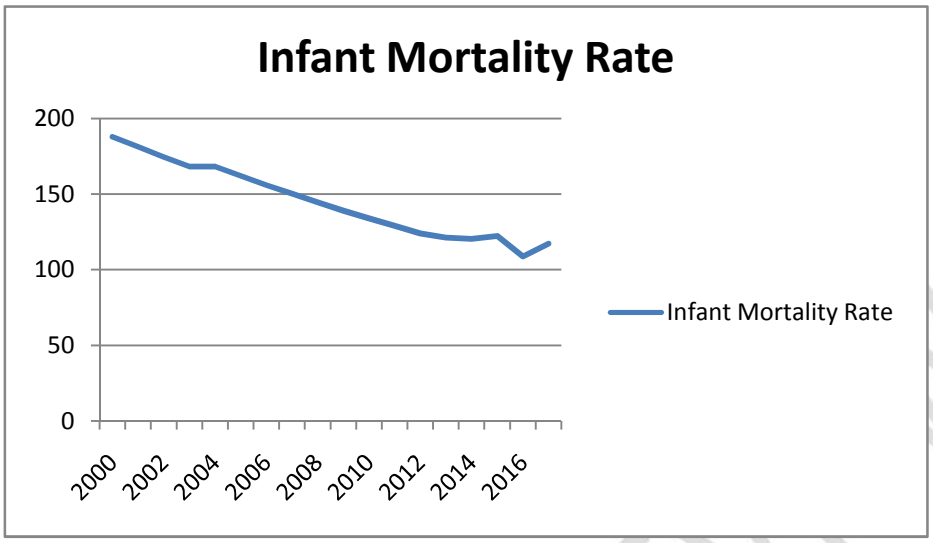
Source: Oxford Poverty and Human Development initiative (2016)

2.3 SOCIAL STATUS IN NIGERIA

The health status of the people of Nigeria has deteriorated significantly in the past decades. Despite the existence of clear health challenges, official statistics of the Nigerian government shows that health outcomes have improved overtime and are mostly better than those of many emerging nations with similar structural characteristics. This report is not supported by findings from other sources such as the World Health Organisation (WHO) as seen in different data sets for health indices such as life expectancy, mortality rate, child and infant mortality. This is one of the reasons this study derived the per capita productivity index (labour productivity) as proxy variable for health status in the country in order to avoid measurement errors in the analyses.

The health status in Nigeria is ranked low among other developing country in the same category. Life expectancy is put at 52 years in 2011[2] and crude death rate, in that same years 14%. It is estimated that 124 out of 1000 new births do not survive beyond age 5. Only 39.56% of male and 42.25% of female survive up to the age of 65 years. There are close to 3 million adults (ages 15-49) living with HIV, while the estimated HIV/AIDS prevalence rate is 3.7%. Nigeria has large stock of health workers that is comparable to that of Egypt and South Africa. However, births attended by skilled health personnel are estimated at 39 percent of total birth. This makes Nigeria the most dangerous places in the world to give birth, with the fourth worst maternal mortality rate in the world, ahead of only Sierra Leone, Central African Republic and Chad (Bill Gate, 2018).

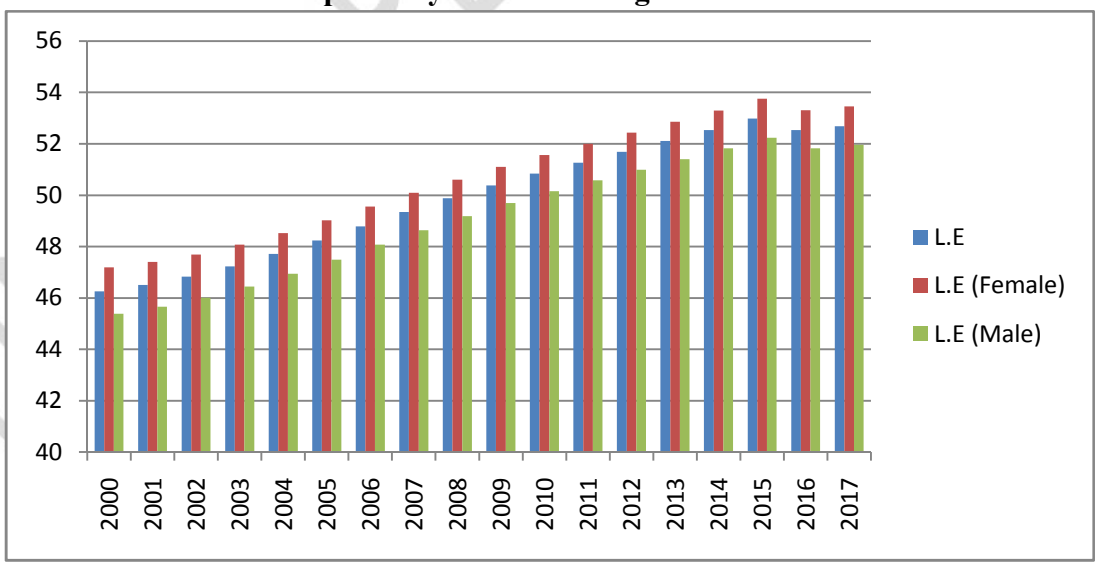
Figure 2.3: Infant Mortality Rate Trends in Nigeria (2000-2017)



Source: Author's Computation using WDI data (2018)

The downward trend in infant mortality prior to 2015 can be adduced to the improved commitment of the previous administrations to the global MDGs over the period. However, due to economic recession occasioned by fall in crude oil price, lack of policy direction, poor attention to healthcare sector in the post 2015 period, and increase in insecurity and killings, the trend has reversed with positive slope as shown in figure 2.3 above. Similar justification applies to the trends in figure 2.5(b) below.

Figure 2.4: Trends in Life Expectancy at Birth in Nigeria



Source: Author's Computation using WDI data (2018)

Figure 2.5(a): Mortality Rate in Nigeria (2000-2017)

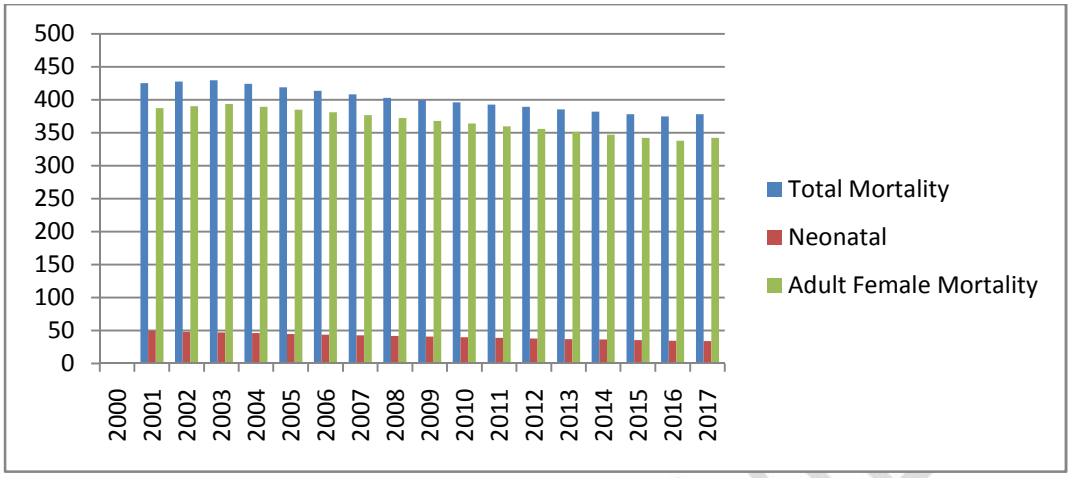
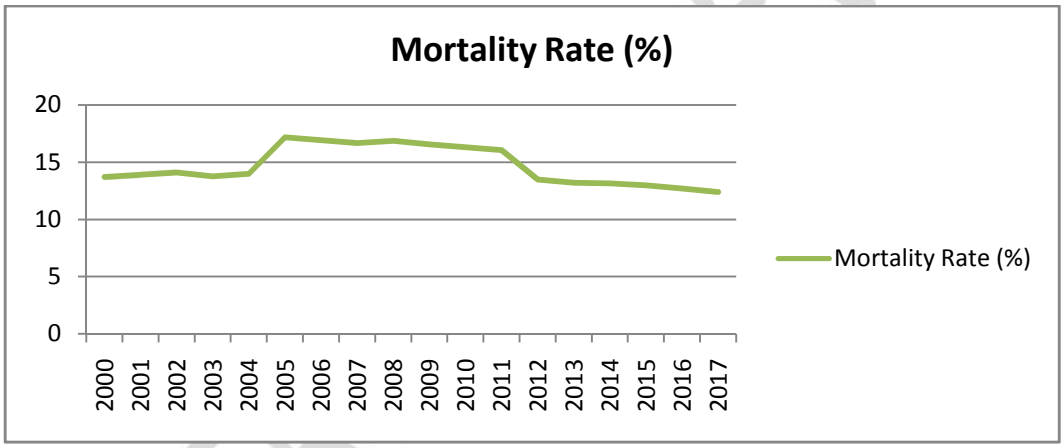
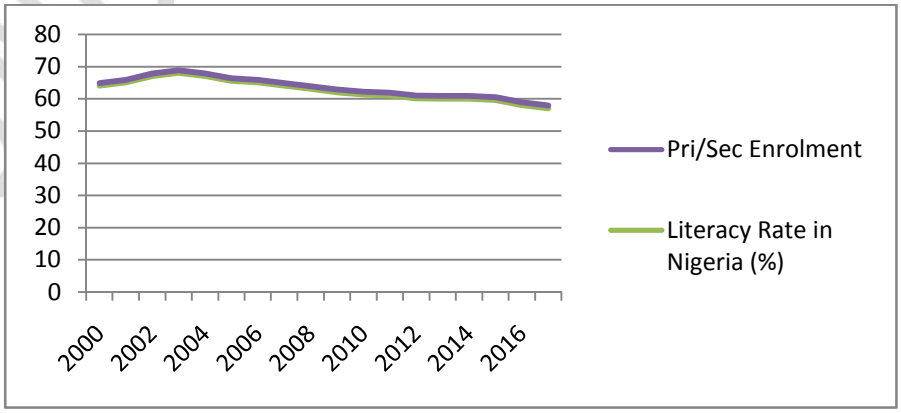


Figure 2.5(b): Mortality Rate in Nigeria (2000-2017)



Source: Literacy Rate -Index Mundi, (2018), Pri/Sec Sch Enrolment- WDI, 2018.

Figure 2.6: Trend in Literacy Rate and Pri/Sec School Enrolment in Nigeria (2000-2017)



Source: Author's Computation

2.4 THEORETICAL FRAMEWORK

2.4.1 Modern Theory of Poverty

This theory is credited to the World Bank and it is formulated around the dimensions identified by the poor peoples. It emphasizes on lack of income and assets to meet basic needs of life and susceptibility to adverse shocks as a result of inadequate capacity to absorb social economic variability. The World Bank takes the economic concept of assets as a starting point to understand the determinants of poverty. To this end, assets are classified into human assets (capacity for human labour, skill and good health), natural assets (land), physical assets (access to infrastructures), financial assets (savings and access to credit) and social assets (network of contacts and reciprocal relations). The poor generally lack most, if not all, of these assets. It is obvious that poverty could be perceived in terms of various kinds of factors. There are also geographic, technological and cultural dimensions and variables. These various factors often work together to raise or reduce poverty.

2.4.2 GROSSMAN THEORY OF HEALTH PRODUCTION

[11] laid the foundation for the evolution Health-Economic relations. The study postulates that Health Status is a function of the initial health endowment at birth, the level of healthcare demands and Education. Grossman's thesis was validated by [12]. [13 and [14] identified the impact of nutrition on health status, as well as the roles of maternal life style, income and education. These form the theoretical triangulation for this study.

2.5 EMPIRICAL REVIEW

Studies abound in literature on poverty with mixed findings. While majority of these studies concentrated more poverty, inequality and economic growth nexus especially amongst developing economies, a few have linked poverty to health outcomes.

[9] investigates the relative impact of economic growth and changes inequality on poverty using the OLS estimation technique. The result of the study shows that both material and social resources do have impact on poverty in Nigeria. The study concluded that there would have been more progress in poverty reduction, particularly in the context of MDGs, if growth had been more equitable than available evidence suggests.

Further empirical evidence on poverty, inequality and rising economic growth presented by [3] using OLS and other analytical tools reveal that GDP growth rate increases inequality, but reduces poverty in Nigeria. The recommended in addition to boosting the GDP, an increased effective government spending on education and public health facilities, as well as programmes that are meant primarily for the non-privileged like children, women and the poor in general, be provided for poverty and inequality to reduce in the country.

Similarly, in an attempt to establish if a causal relationship exists among poverty, inequality and life expectancy in Nigeria, [8] employed the Granger Causality technique and document that there is a direct line of causality between poverty and inequality as well as indirect channels

through unemployment and low life expectancy on inequality which exacerbate poverty in Nigeria.

[15] examines the impact of poverty alleviation programmes on economic growth in Nigeria between 1980 and 2013. The study used the Autoregressive Distributed Lag Model to estimate the impact of real per capita expenditure on economic services and real per capital expenditure on social and community services (proxy as poverty alleviation programmes) on real per capita gross domestic product. Also fiscal deficit is incorporated into the model as a control variable to capture governance and institutional factors that surrounds the effectiveness of poverty alleviation programmes. The results showed that real per capita expenditure on economic, social and community services contributed positively to alleviating poverty in Nigeria while fiscal deficit a surrogate of governance, did not contribute positively to poverty alleviation in Nigeria.

[16] inquires the relationship between poverty, unemployment and corruption in Nigeria between 1996 and 2014. The study investigated the extent to which poverty rate and unemployment rate have influenced corruption in Nigeria. The findings unveiled that unemployment rate and poverty rate had positive impact on corruption in Nigeria within the period reviewed. A percent increase in poverty and unemployment rates would increase corruption approximately by 19.3 units and 11.6 units. The study maintained that the escalating rising rates of poverty would result in some level of free cash flow in the hands of political and administrative leaders which may lead to grand corruption, while the pressure on poor public officers would thereby lead to petty corruption.

3.0 METHODOLOGY

The study adopts the Autoregressive Distributed Lag (ARDL) techniques which is superior to the OLS technique adopted by previous studies. This technique has the merit of simultaneously estimating the short run and long run coefficients with the appropriate properties of unbiasedness and efficiency. The stationarity test results following the Phillips-Perron (PP) tests justified the utilization of this modern estimation technique which of course provides robust results for profound policy implications. This study relies heavily on secondary annualized time series data spanning 37 years between 1981 and 2017. Majority of the data series were extracted from Central Bank of Nigeria (CBN) statistical Bulletin and World Development Indicator (WDI).

3.1 Model Specification

This study adapt the models of previous studies (Adegboyega, 2014; Ogbeide & Agu, 2015; and Kolawole, Omobitan & Yaqub, 2015) by incorporating GDPPE (as measure of productivity of healthy workers (**HP**)), PSE (Public Social Expenditure), Agricultural sector performance (AGRO) and Industry sector performance (MANO) and Infrastructural Development (INFRAD). This study is the first to the best of our knowledge to adopt these all important variables like GDPPE and INFRAD. The choice of these variables stems from the fact that Nigeria faces heavy infrastructural gaps, poor productivity due to obsolesces in educational system and health

practices. These variables have been swept under the carpet by previous studies. This ultimately provides the justifications for the incorporation of these variables and the re-writing of the poverty equation to meet national specifics. As such, the model is presented thus;

$$PVTI_t = f(HP_t, PSE_t, AGRO_t MANO_t INFRAD_t) \ldots\ldots\ldots\ldots (1)$$

$$(PVTI_t) = \beta_0 + \beta_1 \log_e(HP_t) + \beta_2 \log_e(PSEt) + \beta_3 \log_e(AGRO_t) + \beta_3 \log_e(MANO_t) + \beta_3 \log_e(INFRAD_t) + \mu_t \ldots\ldots\ldots (2)$$

Adopting the bounds test approach to equation [2] above a general autoregressive (AR) model of order P in Z_t is depicted this:

$$Z_t = C_O + B_t + \sum_{0=1}^{p} \emptyset t z_{t-1} + e_t \quad 3$$

Where t = 1, 2, 3,…….T

C_o = (k+i) intercept

B = (k+i) trend coefficients

$$DZ_t = C_o + B_t + \pi Z_t\text{-}1 + \sum_{i=1}^{p} \pi_t \Delta Z_t\text{-}1 + e_t \quad 4$$

Where (k+i) (k+i) matrices are summed as π, depicted as: $\pi = I_{k+I} + \sum_{t=1}^{p} \emptyset_t$ 5

$$\pi = -\sum_{j=t+1}^{p} \emptyset_t \; j = 1,2,3,\ldots\ldots,P\text{-}I \quad 6$$

Which contains the long run multipliers and shirt run dynamic coefficients of the error correction mechanism (ECM), and Z_t is the vector variable Y_t and X_t respectively.

Y_t is an explained variable defined as PVTI and X_t is HP, PSE, AGRO, MANO, INFRAD, are identically and independently distributed with zero expected value error vector expressed as:

$$E_t = (E_{1t}, E_{2t}) \quad 7$$

Assumption of a unique long=-run with the among the variables.

By extension

$$\Delta PVTI = B_o + B, PVTI_{t-1} + B_2 \Delta HP_{t-1} + B_3 \Delta PSE_{t-1} + B_4 AGRO_{t-1} + B_5 MANO_{t-1} + B_6 INFRAD_{t-1} + \sum_{i=1}^{j} B_i \Delta PVTI_{t-1} + \sum_{i=1}^{j} B \Delta HP_{t-1} + \sum_{i=1}^{j} B_3 \Delta PSE_{t-1} + \sum_{i=1}^{j} B_4 \Delta AGRO_{t-1} + \sum_{i=1}^{j} B_5 \Delta MANO_{t-1} + \sum_{i=1}^{j} B_6 \Delta INFRAD_{t-1} + e_t \quad 8$$

Therefore, the conditional ARDL long run model can be estimated by adopting:

$$\Delta PVTI = B_o + \sum_{i=1}^{j} B_1 \Delta PVTI_{t-1} + \sum_{i=1}^{j} B_2 \Delta HP_{t-1} + \sum_{i=1}^{j} B_3 \Delta PSE_{t-1} + \sum_{i=1}^{j} B_4 \Delta AGRO_{t-1} + \sum_{i=1}^{j} B_5 \Delta MANO_{t-1} + \sum_{i=1}^{j} B_6 \Delta INFRAD_{t-1} + \sum_{i=1}^{j} B_7 ect_{t-1} + e_t \quad 9$$

Where

Ect_{t-1} the error correction term lagged by one period with expected negative sign.

The '*a priori*' Expectations

It is necessary to state the theoretical relationships in respect of the expected signs and the values of the parameters between Poverty Index (PVTI) and independent variables. Thus, the *a priori* expectations are stated as follows:

$$\beta_1 < 0, \beta_2 < 0, \beta_3 < 0, \beta_4 < 0, \beta_5 < 0$$

4.0 DISCUSSION OF EMPIRICAL FINDINGS

This section contains the pre-estimation tests such as the normality, kurtosis, skewness, measures of dispersion and central tendency on one hand. On the other hand, the stationarity test adopted follows the Phillips-Perron procedure to determine the existence of unit root or otherwise in the time series data collected. These tests also justified the methods of analyses employed in this study.

4.1. SUMMARY STATISTICS

The summary statistics in table 4.1 below show the mean, median, mode and standard deviation of the observations. The means of PVTI, HP, and MANO are greater than their respective standard deviations while the means of PSE, AGRO and INFRAD are lesser than their individual standard deviations. This implies a wide spread amongst the observations of the latter data sets than what is obtainable in the former. Within the same discussion, the skewness of the observations lies between -0.63 and 1.46. Specifically, all other variables except PVTI are positively skewed. Again, the normality test shown by the J-B statistic reveals that at 10% significance level, all variables but PVTI are significant as indicated by the P-value. The preliminary result shows that the variables are in good condition for further analyses.

Table 4.1: Normality Test Result

	PVTI	HP	PSE	AGRO	MANO	INFRAD
Mean	55.60054	254.4270	62319.26	5597.650	2621.438	395.9233
Median	58.10000	214.4607	26616.35	1426.970	1758.610	140.8600
Maximum	74.60000	385.2276	304664.7	21523.51	6684.220	1287.360
Minimum	25.01000	173.0119	339.3500	17.05000	1018.910	6.600000
Std. Dev.	12.40519	73.95968	79252.01	7039.539	1721.523	467.7757
Skewness	-0.636170	0.654871	1.461742	1.009592	1.420193	0.840579
Kurtosis	2.747590	1.794838	4.469529	2.542490	3.592767	2.103284
Jarque-Bera	2.593948	4.883755	16.50550	6.608236	12.97955	5.596860
Probability	0.273358	0.086997	0.000261	0.036732	0.001519	0.060906
Sum	2057.220	9413.800	2305813.	207113.0	96993.22	14649.16
Sum Sq. Dev.	5539.997	196921.3	2.26E+11	1.78E+09	1.07E+08	7877307.
Observations	37	37	37	37	37	37

Source: Author's computation using CBN and WDI data

4.2 Stationarity Test (PHILLIPS-PERRON APPROACH)

The study employs Phillips Perron (PP) tests to examine the variables in the test because it is a basic test for the order of integration. Phillips Perron test is a non parametric test as it does not require selecting the level of serial correlation, it takes the same estimation as ADF test but corrects the statistics to conduct for autocorrelations and heteroscedasticity. The result as shown in table 4.2 below reveals the natural logarithm of public social expenditure (HEALTH and EDUCATION) is stationary at level, while all other variables are stationary after first difference. This implies that the former is integrated of order zero (I(0)), while others are of order one (I(1)). This therefore justifies the adoption of the modern ADRL sophisticated estimation technique.

Table 4.2: Result of stationarity test

Variable	Method	At Level			At First Difference			Order
		T-statistics	5% critical value	Prob	T-statistics	5% critical value	Prob	
PVTI	PP	-3.4934	-3.5403	0.0564	-8.7168	-3.54428	0.0000	I (1)
LOGHP	PP	-2.3469	-3.5403	0.0022	-4.8377	-3.54428	0.0022	I (1)
LOGPSE	PP	-3.8649	-3.5403	0.0242				I (0)
LOGAGRO	PP	0.0907	-3.5403	0.9960	-3.8496	-3.54428	0.0254	I (1)
LOGMANO	PP	-1.6186	-3.5403	0.7656	-5.8280	-3.54428	0.0002	I (1)
LOGINFRAD	PP	-1.1129	-3.5403	0.9128	-4.2139	-3.54428	0.0108	I(1)

Source: Author's computation using eviews 10

4.3 BOUNDS TEST

Table 4.3 below presents the results of the bound test to co-integration. The bound test helps to ascertain if a long run equilibrium relationship exists among the variables in the multivariate model to be estimated. The result reveals that a long run equilibrium relationship exists among the variables in the model. This implies that health status, public social expenditures, agricultural sector performance, manufacturing output and infrastructural development have long term effects on poverty incidence in Nigeria. This is ascertained since the value of F-statistic of 4.9346 is greater than the both the lower and upper bounds of the T-statistic at all levels of significance.

Table 4.3: Bounds Test Result

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.934622	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Source: Author's computation using eviews 10.

4.4 ARDL LONG RUN ESTIMATES

Table 4.4: ARDL Long Run Form

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	59.42561	51.39124	1.156337	0.2599
PVTI(-1)*	-0.963142	0.184340	-5.224804	0.0000
LOGHP(-1)	-24.85332	14.85333	-1.673249	0.1084
LOGPSE**	-0.726678	2.525526	-0.287733	0.7762
LOGAGRO**	-4.816644	5.664766	-0.850281	0.4043
LOGMANO(-1)	15.07152	6.374733	2.364260	0.0273
LOGINFRAD(-1)	11.36923	7.566911	1.502493	0.1472
D(LOGHP)	-57.57436	17.39057	-3.310666	0.0032
D(LOGHP(-1))	-27.17723	15.64132	-1.737528	0.0963
D(LOGMANO)	22.07763	8.206945	2.690116	0.0134
D(LOGMANO(-1))	-9.591685	7.176397	-1.336560	0.1950
D(LOGINFRAD)	16.84164	8.635197	1.950348	0.0640
D(LOGINFRAD(-1))	17.39151	6.447926	2.697226	0.0132

Source: Author's computation using eviews 10

The result presented in table 4.5 below shows the short run effects of the explanatory variables on the explained variable. The CointEq(-1) conforms with theoretical expectation of negative sign with exact value of -0.96. This implies that disequilibrium in the model is restored annually at an adjustment speed of over 96 percent which is significant as observed from the p-value

4.5. ARDL Error Correction Regression

ECM Regression Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGHP)	-57.57436	12.63495	-4.556755	0.0002
D(LOGHP(-1))	-27.17723	12.14091	-2.238484	0.0356
D(LOGMANO)	22.07763	6.228958	3.544354	0.0018
D(LOGMANO(-1))	-9.591685	5.664162	-1.693399	0.1045
D(LOGINFRAD)	16.84164	4.536032	3.712858	0.0012
D(LOGINFRAD(-1))	17.39151	4.732254	3.675101	0.0013
CointEq(-1)*	-0.963142	0.145260	-6.630460	0.0000
R-squared	0.635667	Mean dependent var		1.305714
Adjusted R-squared	0.557596	S.D. dependent var		5.490570
S.E. of regression	3.651968	Akaike info criterion		5.605266
Sum squared resid	373.4324	Schwarz criterion		5.916336
Log likelihood	-91.09216	Hannan-Quinn criter.		5.712647

Durbin-Watson stat	2.245665

Source: Author's Computation using eviews 10.

In the short run, log(HP), LogHP(-1) and LogMANO(-1) have negative effects on Poverty Incidence, though LogMANO(-1) did not bears a significant effect, the effects of Log(HP) and LogHP(-1) are statistically significant. The negative impact of Health status productivity (HP) on poverty incidence implies that as productivity level of Nigerians increases, poverty incidence reduces. This is in conformity with a priori expectation. However, current year manufacturing output i.e LogMANO, and infrastructural development i.e LogINFRAD both current year and previous period have positive and significant effects on poverty incidence in Nigeria. Though this finding is uncommon in literature as it negates theoretical expectation, this implies that as current manufacturing output and infrastructural development proxied by capital allocation on infrastructure rise, poverty incidence also rises. To rationalize this, this study identified the poor run of performances of the manufacturing sector since the discovery of crude in commercial quantity and the high level of corruption which impairs efficiency in the utilization of public funds sanctioned to infrastructural development in the country.

From table 4.4 above, the long run estimates result reveals that previous public social expenditure (health and education)- LogPSE, LogAGRO, LogMANO(-1) and LogHP bear negative effects on poverty incidence in Nigeria. This implies that as these variables increase, poverty incidence falls. Of these variables, only LogHS is statistically significant while others are not significant. Within the same documentation, current period INFRAD and MANO bear positive and significant impact on poverty incidence in the long run. On the basis of our findings, the following conclusions were drawn and policy suggestions proffered.

5.0 CONCLUSION AND POLICY IMPLICATIONS OF THE STUDY

This study examines poverty incidence and health nexus using the bounds test approach. From the empirical test results it can be concluded that poverty alleviation is possible through policies that are aimed at promoting the better health conditions for enhanced productivity of employees, stimulate growth in real sectors (agriculture and manufacturing in previous period) and improved public social expenditures. Furthermore, infrastructural development efforts are not adequate to encourage balanced growth that will alleviate poverty in the country, and the current manufacturing sector output worsens poverty in current period than alleviates it.

The study there recommends that:

(a). The government should focus on productivity enhancing efforts of Nigerians in both private and public sectors through improvement in education sector financing. This would help build competent human capital required to drive a formidable growth and development process that will alleviate poverty.

(b). The government at all levels should increase the allocation to healthcare which is at the moment insignificant compared to unproductive and corrupt prone sectors. Resources committed to health should be considered as an investment especially to the less privileged in the society. This can enhance the productivity of the poor, and if labour is paid the value of its marginal productivity, improved productivity goes with higher reward, hence poverty reduction.

(c). Adequate and appropriate infrastructures should be provided in terms of energy, transportation, communication and storage to encourage the performances of the agricultural and manufacturing sectors of the economy. This will help provide employment, reduce dependency, ill-health and ultimately ameliorate poverty in the country.

(d). The government should return the nation's economic management towards the national development plans which will consider specific regional needs and how to solve peculiar regional poverty incidence on the basis of the causes. This is because poverty in certain regions is cultural while it political in some other regions.

(e). The Nigerian government should de-politicize her poverty alleviation programmes. Those programmes should be devoid of electoral ambitions if they are to succeed. For instance, the N-POWER programme has been hijacked by over ambitious politicians, who incorporate non-beneficiaries, fail to monitor beneficiaries, and the entire process is corruption personified.

REFERENCES

1. World Development Indicator.: World Bank Data on economies of the world, 2017.
2. World Bank Poverty Headcounts, 2018.
3. Kolawole, BO, Omobitan, OA, Yaqub, JO. Poverty, Inequality and Rising Growth in Nigeria: Further Empirical Evidence. International Journal of Economics and Finance. 2015:7(2), 51-62.
4. United Nations Reports sustainable development goal of health outcomes, 2018.
5. National Bureau of Statistics, Nigeria Data. www.nigerianstat.gov.ng. 2017.
6. Index Mundi. www.indexmundi.com. 2017
7. Nwani, SE, Kelani, AF, Ozegbe, A.E, Oluleye, HB. Public Health Expenditures, Environmental Pollution and Health Outcomes: Evidence from Nigeria. South Asian Journal of Social Studies and Economics. 2018:2(2), 1-15.
8. Ogeide, ENO, Agu, DO. Poverty and Income Inequality in Nigeria: Any Causality? Asian Journal of Economic and Financial Review, 2015:5(3), 439-452.
9. Adegboyega, RR. Economic Growth, Poverty and Inequality Link: Nigeria Experience. Ago-Iwoye Journal of Social and Bahavioural Sciences, 2014:3(2), 147-170.
10. Narayan, D., Chambers, R., Shah, MK, Petesch, P. Voices of the Poor: Crying Out for Change. Washington D.C.:World Bank. 2000.
11. Grossman, M. On the concept of health capital and demand for health. Journal of Political Economy. 1972:80(2), 223-225. http://dx.doi.org/10.1086/259880
12. Lleras-Muney. The Relationship between Education and Adult Mortality in United State. Princeton University press. 2002.
13. Mckeown. The Modern rise in population and mortality rate. A scientific combination to falling mortality.1976.
14. Fogel, RW. Health, Nutrition and Economic Growth. Economic development and cultural change. University of Chicago press. 2004.
15. Baghebo, M., Emmanuel, N. The Impact of Poverty Alleviation Programmes on Economic Growth in Nigeria. International Journal of Humanities and Social Science. 2015:5(10),177-189.

16. Enofe, AO, Oriaifoh, CL, Omagbon, P. Poverty, Unemployment and Corruption in Nigerian Public Sector. International Journal of Economics and Business Management. 2016:2(2),79-97.