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THE IMPACT OF HEALTH EXPENDITURE ON THE GROWTH OF THE NIGERIAN ECONOMY: THE ARDL APPROACH

Isaac Aduralere Ilori
Department of Economics, Ekiti State University, Ado Ekiti, Ekiti State, Nigeria
isaaceco.52@gmail.com

Michael Olufemi Ajiboye
Department of Economics, Ekiti State University, Ado Ekiti, Ekiti State, Nigeria
olufemimajiboye@yahoo.com

Abstract

A nation with healthy people is considered a wealthy nation. Thus, as a result of this, no amount of resources spent on health by a nation is considered too much. This paper is designed to examines the impact of health expenditure on economic growth in Nigeria, using time series data spanning from 1981 to 2013. Ordinary least square regression analysis, Auto-regressive Distributed Lag (ARDL) Model approach and Error Correction Mechanism (ECM) are employed as the estimating techniques to test the existence of long-run relationship among the variables and the result shows positive impact that gross capital formation, and total health expenditure determine in part the level of economic growth in Nigeria while life expectancy rate indicates statistical negative impact on the growth contrary to theoretical economic expectation for the period covered by the study. As a result, the following policy measures are suggested among others that government should encourage savings and investments in the economy, increase expenditures on health provisions, induce the level of labour productivity and place priority on the issues of security to lives and properties so as to pave way for growth and development of the Nigerian economy.

Keywords: ARDL, Economic growth, Health Expenditure, Nigerian Economy

INTRODUCTION

The effect of health on worker's productivity suggests a relationship between health and aggregate output. Healthy workers lose less time from work due to ill- health and are more productive when working. Health gains had the economic consequences of widespread economic growth and an escape of ill-health traps in poverty (World Health Organization, 1999). There has been a growing interest to extend the relationship between health and economic growth, catalyzed in considerable extent by a 1993 World Bank report on health (World Bank 1993). Barro (1996) assert that, health is a capital productive asset and an engine of economic growth. Fifty percent of economic growth differentials between developed and developing nation is attributable to ill-health and low life expectancy (World Health Organization, 2005).

Developed countries invest a substantial proportion of their budgetary allocations on provision of health care because they are convinced that their residents' health can serve as a major driver for economic growth. As health is wealth, no amount spent on health by a nation is considered too much. The United Nation (UN) recommended for a country, an average of 8 to 10 percent of the GDP as benchmark expenditure on health. Governments in Nigeria, over the years have made deliberate efforts at ensuring that there is increase in the level of public expenditure on health according to an in-depth and trend analysis investigation conducted in some years back. This is because of the importance of health to nation building and as a facilitator of economic progress. It should however be noted that despite the increase in government expenditure on health provisions in Nigeria, the contribution of this to human health is still marginally low. Moreover, the extent and magnitude of its impact on economic growth is yet to be adequately investigated probably because of the general unidirectional impression that economic growth facilitates better health. Off course, for example, economic growth could lead to increased availability of food for better healthy living; increased earning which makes health spending more affordable; and also raises demand for good health services. Higher growth could also imply higher public revenue which can translate into higher investment in health infrastructure. Therefore, there is a question of whether causality exists in the reverse direction? In other words, does improved health lead to higher growth? If yes, then to what extent and in what magnitude does health contribute to economic growth especially when one accounts for other potential factors that are empirically known to drive growth? It is therefore likely that causality exists in both directions. However, the question of which direction dominates could be an area of interest for further studies. Therefore, this paper seeks to evaluate the growth impact of health expenditure to determine the extent and magnitude of its contributions to the Nigerian economy from 1980 to 2013.

Statement of the Problem

There seems to be a broad consensus that economic growth can definitely lead to improvement in health. For example, economic growth could lead to increased availability of food; increased earnings which makes health spending more affordable; and also raises demand for good health services. Higher growth could also imply higher public revenue which can translate to higher investment in health infrastructure. Thus, the question that would readily come to mind is whether causality exists in the reverse direction? In other words, does improve health leads to higher growth? If yes, how important is the contribution of health when one accounts for other potential factors that are empirically known to drive growth? It is therefore likely that causality exist in both directions, though they could be difficult to measure and estimate. Nevertheless, it is evident that there is increasing debate on which direction dominates. A resolution or informed contribution to this debate would have profound policy implications. For example, an empirical finding which suggests that growth lowers infant mortality could spur the necessity for putting in place growth-enhancing policy reforms. In the contrast, if it is observed that improve health of the population is growth enhancing, then it would be noted that social returns on policies that improve health status have been largely understated, and thus health improving policies would be part of the set of intervention measures to increase growth. There are several studies on economic growth in Nigeria. Most of the studies have related growth to other macroeconomic fundamentals while omitting the human capital (both in terms of education and health) dimension of the analysis. The role of health in these analyses is generally absent. Also, most of these studies are carried out at the micro-level using single point survey rather than multiple points survey. Therefore, the ability to generate a health production function from a point survey has been questioned. Furthermore, most of these studies have neglected the possibility of reverse causation and endogeneity in the health-growth-poverty relationship leading to what is generally regarded as specification bias. Hence findings from these studies have been inconclusive, contradictory and unreliable. Thus, there has been general absence of consensus on the relationship. Hence, the lack of consistent findings in the literature, and possibly specification problems in the early works, lends justification to the analysis that we pursue in this study.

LITERATURE REVIEW

The Concept of Health

The study of the relationship between health care spending and economic growth is rather a new phenomenon in economic literature and it has received a lot of attention in recent times. Health as human capital affects growth directly through, for example, its impact on labour productivity and the economic burden of illness. Bloom and Canning (2009; 2012) opined, on how healthy populations tend to have higher productivity due to their greater physical energy and mental clearness. According to them, healthier individuals might affect the economy in four ways:

(i) They might be more productive at work and so earn higher incomes;

(ii) They may spend more time in the labour force, as less healthy people take sickness absence or retire early;

(iii) They may invest more in their own education, which will increase their productivity and;

(iv) They may save more in expectation of a longer life-for example, for retirement-increasing the funds available for investment in the economy. Health is so important as both a source of human welfare and a determinant of overall economic growth

Also, according to WHO (1996) ‘’health is a state or ability of individual to live a socially and economically productive life’’. Health is a somewhat nebulous condition, difficult to define and never in a state of perfection since one can be really sick, but never perfectly healthy. Health is a multi-dimensional concept that is usually measured in terms of absence of physical disability or a condition that is likely to cause death, emotional well-being and stationary social functioning. Health could be seen as physical and mental well-being of people which is measured using indicators such as life expectancy, adult mortality, child mortality rate, adult survival rate and so on (Aguayo-Rico, 2005). Health in recent times has been considered to be very crucial in terms of how it affects productivity as well as other means of human capital formation.

According to Bloom and Canning (2008), “health is a direct source of human welfare and also an instrument for raising income levels”. The level of productivity and growth in an economy will be greatly hampered by ill-health or prevalence of diseases in such an economy. This is because the likelihood exists that healthy individuals have the tendency to think rightly, be more efficient and obtain higher productivity (Bloom and Caning, 2000 and Aguayo-Rico, Guerra-turrubiates & Deoca-hernadez, 2005).

Bloom and Canning , (2000) had maintained that health actually imparts economic growth and development but for most developing countries there must bea deliberate efforts geared towards health programme which would invariably increase the health status of their population thereby leading to increased man-hour for productivity gains.

Concept of health Care Spending in Nigeria

Public health care in Nigeria is organised around approximately 13,703 Primary Health Centres (PHC) supported by a network of hospitals that includes 845 secondary and 59 tertiary health care centres which included University Teaching Hospitals, and Specialised Hospitals. There is a variety of types of basic care facilities especially in the rural areas group by various names like dispensaries, health centres and health posts. In addition to the public health cares, the informal private-traditional healers-remain an important source of care that should not be forgotten especially in the rural areas of the country. Going by the statistics, about 47.8 percent and 70.9 percent have health access in rural and urban areas respectively while 9.1 percent and 4.6 percent consulted traditional healers in both the rural and urban areas respectively. An analysis of health spending in Nigeria reveals that insufficient funds are allocated to health sectors of the economy. Hence, there is large room for improvement in terms of both efficiency and equity. The above is an indication that the government over the years have underestimated the importance of investing in health. This among other factors is the reason for the lukewarm attitudes of the services providers at both the public and private health centres. The proportion of resources devoted to health out of the available total resources continued to dwindled to as low as 1.07 per cent between 1987 and 1992. Other years range between 2 and 3 per cents while the figures for 2002 and 2007 fell between 4.11 and 6.21 per cents. The total expenditure as a percentage of GDP for all years falls under 10 per cent as recommended by UN but 2006 and 2009 which are respectively 9.87 and 9.25 per cents are higher than 8 per cent.

Theoretical Literature

Wagner's Law of Increasing State Activities

Adolph Wagner (1835-1917) was a German economist who based his law of increasing state activities on historical facts, primarily of German. According to Wagner, there are inherent tendencies for the activities of different layers of a government (such as central and state governments) to increase both intensively and extensively. There was a functional relationship between the growth of an economy and the growth of the government activities so that the governmental sector grows faster than the economy. In the original version, it is not clear whether Wagner was referring to an increase in (a) absolute level of public expenditure (b) the ratio of government expenditure to GNP, or (c) proportion of public sector in the total economy. Musgrave's interpretation is that Wagner was thinking of (c) above. F.S. Witti not only supported Wagner's thesis but also concluded with empirical evidence that it was equally applicable to several other governments which differed widely from each other. All kinds of governments, irrespective of their levels, intentions and size had exhibited the same of increasing public expenditure as a result of the understated points.

Foremost as the traditional functions of the state were expanding, defence was becoming more expensive than ever before. Within the country, administrative set up was increasing both in coverage and intensity. The government machinery had to be manned by experts in their field. Administration justice and so on was becoming more extensive and cumbersome as the society progressed. An additional force pushing up public expenditure here is the fact that various complexities of social and economic nature develop which made an efficient administration also more complex and expensive.

Secondly, the state activities were increasing in their coverage. Traditionally, the state was limited to only defence, justice, law and order maintenance of the state and social overheads. But with the growing awareness of its responsibilities to the society, the government was expanding its activities in the fields of various welfare measures. These include the measures to enrich the cultural life of the society and also those design to provide social security to the people. State activities were also increasing on account of its effort in redistributing income and wealth.

Thirdly, the need to provide and expand the sphere of public goods was being increasingly recognized. The state was trying to shift the composition of national product in favour of public goods and this necessitated the expansion of the investment activities of the government. Wagner's law was based on historical facts. It did not show the inner compulsions under which a government has to increase its activities and public expenditures as time passes. His law was applicable to modern progressive governments only; in which the state was interested in expanding the public sector of the economy and undertakes other activities for the general benefit. This general tendency of expanding state activities has a definite long term trend, though in the short run, financial difficulties could come in the way. "But in the long run, the desire for development of a progressive people will always overcome these financial difficulties".

In line with this study , government Health expenditure and other health status components are expected to influence the welfare and life of the people, as government activities expands, government setup policies that can adequately ensure the achievement of the overall macroeconomic objectives. It is expected that public health expenditure, the level of capital formation and labour productivity determine in part the level of economic growth in Nigeria. Therefore, economic policies of the public health expenditure is expected to influence child health, human capital development, labour productivity and life expectancy rate lots more. Public health expenditure, life expectancy rate, secondary school enrolment and gross capital formation are expected to have positive sign on economic growth. Therefore, this theory is applicable to the determination of health related issues in the country which is a subject of the utilization and distribution pattern of health expenditure in the country.

Keynesian Theory of Public Expenditure

Keynesian schools of thought (1936) believe that expenditure can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augments aggregate demand which provokes an increased output depending on expenditure multiplier. Keynes postulates that: (i) the extension of the functions of the states leads to an increase in public expenditure on administration and regulation of the economy.

(ii) the development of modern industrial society would give rise to increasing political pressure for social progress and call for increased allowance for social consideration on the conduct of industry.

(iii) the rise in public expenditure will be more than proportional increase in the national income (income elastic wart) and thus results in a relative expansion of the public sector.

Empirical Literature

The interactions between health care expenditure and economic growth have received a lot of attention of researchers with some insight contributed to the issue.

Aguayo-Rico and Iris (2010) examines the impact of health on economic growth for 13 European countries, 12 African countries, 16 American countries, and 11 Asian countries over the period 1970-80 and 1980-90 using ordinary least square (OLS), the authors find that health capital has a significant effect on economic growth, especially with a variable that captures all the determinants of health. Some other studies on health and economic growth conducted earlier found a positive relationship between the two.

Barro (1991) and Barro and Sala-i-Martin (1999); Knowles and Owen (1995) and (2006) have investigated the positive effect of health on economic development. They also found a strong effect of health in explaining income per capita differences. Other studies such as Greiner (2005), Agenor (2007), Strauss and Thomas (1998) and Martins (2005) conducted for other countries all emphasized that health expenditure is positively related to economic growth. What differ from one country to another is the extent and magnitude of its contributions. In a study of 15 states from India for the period 1973/74, 1977/78, 1983, 1987/88, 1993/94, 1999/2000, Gupta and Mitra (2010) show that per capita public health expenditure positively influence health status, that poverty declines with better health, and that growth and health have a positive two-way relationship. Similarly, some empirical and historical studies have analyzed the relationship between health and economic growth. They establish an endogenous relationship between them and, at the same time, argue that there are exogenous factors, which determine the health conditions of a person (Hamoudi and Sachs 1999). Aurangzeb (2009) investigates the relationship between health expenditure and economic growth within an augmented Solow Growth model for Pakistan during the period 1973-2003, Johansen co-integration technique and error correction model (ECM) are applied. The author finds a significant and positive relationship between GDP and health expenditure in both short- and long-run.

Haiderali shah bukhari, and Sabihuddin butt(2010) also support for the existence of a long run relationship between GDP and health expenditure and the exogeneity of GDP in Pakistan. Cuddington and Hancock (1995), used a neoclassical one sector, two factor growth model to predict economic growth in Tanzania and Malawi. They found that over the period 1985-2010, average annual G.D.P. growth would be reduced by 1.1 percentage points in Tanzania and 1.5 percentage points in Malawi. Also, should AIDS treatment costs be entirely financed from savings, the AIDS epidemic would reduce per capita G.D.P. growth by 0.3 percentage points and 0.1 percentage points in Malawi and Tanzania respectively. Gallup, Sachs and Mellinger (2007) supported the positive relationship between health and economic growth. They find a strong relationship between initial levels of health and economic growth, using life expectancy at birth as their basic measure of overall health of the population. They conclude that improved health is associated with faster economic growth. In his own reaction, Philips (2009) affirms that over the past 50 years, life expectancy has improved and infant mortality declined continuously in all parts of the world, except sub-Saharan African in the 1990s; Good health can reinforce economic growth by enabling people to be more productive especially in countries that have little corruption, poor health can constrain economic growth because it reduces the quality and quantity of labour. Also, in a study of India, the World Bank (2004) examines the impact of per capita GDP, per capita health expenditure and female literacy on infant mortality using state- level data over the period 1980-99. The study observes that both per capita public spending on health and per capita GDP are inversely related to infant mortality rate, but the results were observed not to be very robust to alternative specification of the model.

In the same vein, Lustig (2006) in the study on the direct relationship between health and growth in Mexico uses 1970-1995 data and uses life expectancy and mortality rates for different age groups as health indicators. He observed that health is responsible for approximately one-third of long- term economic growth. He considered health to be an asset with an intrinsic value as well as instrumental value. Good health according to him is a source of wellbeing and highly valued throughout the world. By using the adult survival rate as an indicator of health status, Bhargava, et al. (2005) finds positive relationship between adult survival rate and economic growth. Results remains similar when adult survival rate is replaced by life expectancy. However, fertility rate have a negative relationship with economic growth. Due to the fact that life expectancy is highly influenced by the child mortality, growth in workforce is mostly lower than population growth. Consequently, high fertility rate reduces the economic growth by putting extra burden on scarce resources.

Bloom, Canning and Sevilla (2009) in their study agreed with others on the positive and significant effect of health on economic growth. They therefore suggested that a one year improvement in a population life expectancy contribute to a recent increase in output. In the field of health economics, the endogenous causality between health and income has been the topic of several studies whose purpose is to establish the direction of the causality. Loft (1978) gives an informal explanation of this causality: a lot of people who otherwise would not be poor are, simply because they are sick; however, few people who otherwise would be healthy are sick because they are poor . In order to explain the direction of the causality of the impact of health over income, Smith (1999) uses life cycles models, which link health condition with future income, consumption and welfare. According to this, Bloom and Canning (2000) explain this direction of the causality with education, indicating healthy people live more and have higher incentives to invest in their abilities since the present value of the human capital formation is higher. The higher education creates higher productivity and, consequently, higher income. Also, Hartwig (2010) conducts causality testing for a panel of 21 OECD countries using panel Granger causality test over the period 1970-2005, the author find that health capital formation fosters long term economic growth in all the OECD countries under study.

Devlin and Hansen (2001) examined Granger causality between health expenditure and GDP and showed some (mixed) evidence that indeed there might be bi- directional (Granger) causality between health spending and income. Mehrare and Musai (2011) examines the relationship between health expenditure and economic growth for Iran over period 1979-2008 by employing Gregory-Hensen (1996) co-integration techniques which allows the presence of potential structural breaks in data. The authors find the presence of a long run relationship between health expenditure and the income elasticity for health care spending is greater than one during the period under study. The results also suggest one-way causality relationship running fr om GDP to health expenditure, thereby concluding that health expenditure does not granger caused economic growth.

Another study by Baltagi and Moscone (2010) estimates a regression equation for health care expenditure as a function of GDP and other control variables using data on 20 OECD countries over the period 1971-2004 by using maximum likelihood estimation (spatial MLE) techniques to estimate and test fixed effects and spatially correlated errors. The authors find that health care expenditure is a necessity rather than a luxury with an elasticity much smaller than that estimated in previous studies. Moreover, some empirical evidence also emerged from Nigeria. For example, Odior (2011) conducts a study on the relationship between health and economic growth by using an integrated sequential dynamic computable general equilibrium (CGE) model over the period 2004-2015 to investigates the impact of government expenditure on health on economic growth. The findings suggest that the re-allocation of government expenditure to health sector is significant in explaining economic growth in Nigeria.

Similarly, Dauda (2011) examines the relationship between health expenditure and economic growth for Nigeria spanning from 1970-2009 by employing descriptive statistics, Johansen co-integration technique and error correction model (ECM), the author suggest that health expenditure is positive and statistically significant but the coefficients of the second and third lags are negative and statistically significant. The results of error correction model is statistically significant and has expected negative sign with the coefficient of 40% implying that the speed of adjustment to is 40%. Again, Chete and Adeoye (2002), studied the empirical mechanics through which human capital influences economic growth in Nigeria. They attempted to achieve this objectives using vector Auto regression analysis and ordinary least square to capture these influences. They however concluded that there is an unanticipated positive impact of human capital on growth which the various Nigerian governments since the post independence have appreciated by prodigious expansion of educational infrastructure across the country; but they are quick to point out that the real capital expenditure on education and health have been rather low.

Ogundipe and Lawal (2011) examined the impact of health expenditure on economic growth in Nigeria. Using the OLS technique, they found a negative effect of total health expenditure on growth. Bloom et al (2004) estimate a production function of aggregate economic growth as a function of capital stock, labour and human capital (education, experience and health).Their main result is that health has positive, statistically significant effects on economic growth. They however, do not consider how health is created. Olaniyi and Adams (2000) descriptively analysed the adequacy of the levels and composition of public expenditures and conclude that education and health expenditures have faced lesser cuts than external debt services and defence, but allocations to education and health sectors are inadequate when related to the benchmark and the performance of other countries.

Baldacci (2004) explore the role played by health expenditures. He constructed a panel data set for one hundred and twenty developing countries from 1975-2000 and found that spending on health within a period of time affects growth within that same period while lagged health expenditures appear to have no affect on growth. He inferred from this result that the direct effect of health expenditure on growth is a flow and not a stock effect. Bloom et al (2004) estimate a production function of aggregate economic growth as a function of capital stock, labour and human capital (education, experience and health). Their main result is that health has positive, statistically significant effects on economic growth. They however, do not consider how health is created. Olaniyi and Adams (2000) descriptively analysed the adequacy of the levels and composition of public expenditures and conclude that education and health expenditures have faced lesser cuts than external debt services and defence, but allocations to education and health sectors are inadequate when related to the benchmark and the performance of other countries.

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Odusola(1998) studied the nexus between investment in human capital and growth of economic activities. Using Nigerian data, he estimated three models. It was discovered from the result of the three models that human capital formation is a crucial determinants of the growth process. Other studies such as Greiner (2005), Agenor (2007), strauss and Thomas (1998) and Martins (2005) conducted for other countries all emphasized that health expenditure is positively related to economic growth. What differ from one country to another is the extent and magnitude of its contributions. This study fills this gap by studying the extent and magnitude of health expenditures' contributions to the growth of Nigerian economy.

RESEARCH METHODOLOGY

Empirical Research Model

The economic growth model used in this study is based on the neo-classical Solow production function but with little modification. According to solow's formulation, economic growth is a function of capital accumulation, an expansion of labour force and "exogenous" factor technological progress(FTP) which makes physical capital and labour more productive. That is:

$Y_t = (K_t, A_t, L_t)$..........(i) Where:

Y_t = Aggregate real output in time-t

K_t = Capital stock (investment) in time-t

A_t = Efficiency factor/level of Technology

t = Time dimension

L_t= Labour in time -t

But according to Odusola (2002)and Lusting(2006) respectively human capital and Life Expectancy influences economic growth and hence the model can be modified by adding Human capital(H_t)and Life expectancy rate(LR) such that:

$Y_t = K_t^{\alpha} L_t^{1-\alpha}(A_t H_t LR_t)$..(ii)

The reduced equation for the above will appear as:

Log Y_t = αlogK_t +(1-α)logL_t +log(A_t, H_t)+ LR_t...(iii)

Where:

(GDP) Log Y_t = log of real output proxied as Log of Gross Domestic Product

(LG CF) Log K_t = log of capital stock proxied as Log of Gross Capital Formation (LTHE) Log H_t = log of human capital proxied as Log of Total Health Expenditure (LSSE) Log L_t = Log of labour factor proxied as Log of Secondary School Enrolment

(LER) Average number of years a child from birth proxied as Life Expectancy Rate

Based on the above formulations, the model can be specified in the regression explicit form as:

$GDP_{gt} = \beta_0 + \beta_1 GCF_t + \beta_2 THE_t + \beta_3 SSE_t + \beta_4 LER_t + \mu_t$ ....(iv)

β_0 = constant intercept

β_1, β_2 β_3 and β_4 are parameters of elasticities to be estimated

μ_t = Stochastic error term

Equation (iv) above is estimated using Auto-regressive technique. The study specified unrestricted over-parameterized equations with an inclusion of one-lag error correction term. From the over-parameterized model, which usually deals with problems of mis-specifications, the study derives a parsimonious model through stepwise reduction of relatively insignificant parameters until parsimony is obtained. The co-integrated(Equation iv) is re-specified as an ECM using Engel-Granger two-step method (lagged residual as error correction term). The economic model (Eq. iv) is transformed into an econometric model under ECM framework in Equation v as follows:

$$\Delta Log(GDP)_{gt}=\beta_0+\sum_{i=0}^{n}\beta_{1i}\Delta Log(GCF)_{t-i}+\sum_{i=0}^{n}\beta_{2i}\Delta Log(THE)_{t-i}+\sum_{i=0}^{n}\beta_{3i}\Delta Log(SSE)_{t-i}+\sum_{i=0}^{n}\beta_{4i}\Delta Log(LER)_{t-i}$$

$$+\beta_5 GCF_{t-1}+\beta_6 THE_{t-1}+\beta_7 SSE_{t-1}+\beta_8 LER_{t-1}+ECM(-1)_{t-1}+\mu_t \text{..............................(v)}$$

Where: ECM is the error correction term (lagged residual of static regression) and
'Δ' stands for first difference. All the variables in the equation are stationary and
therefore OLS method gives consistent and valid estimates (Enders, 1995). The model is estimated by OLS method and the residual is tested for autocorrelation error. The model makes use of annually time series data and has lagged dependent variable as explanatory variable. Stability and residual tests are conducted to evaluate the predictive accuracy of the model.

Description/identification of variables

The variables used in our research model are specified as follow:

Gross Domestic Product (GDP_{gt}): In line with economic theory, it is expected that total health expenditure, the level of capital formation, labour productivity and life expectancy at birth determine in part the level of economic growth in Nigeria.

Total health expenditure (THE_t): This is expected to have positive sign since an increase in public health expenditure is expected to improve the health of the labour force and consequently increase their productivity.

Secondary School Enrolment(SSE_t): An increase labour productivity will inevitably increase gross domestic output. The effect of labour force productivity is expected to be positive. This is because increase in labour force productivity will mean that greater output will be produced. At the same time, it enhances aggregate supply and sustainable development.

Gross Capital Formation(GCF_t): This is expected to have positive sign mainly because increase in capital formation represents an increase in investment and this is expected to cause increase in national output.

Life Expectancy Rate (LER_t): This is the average number of years a child would live base on the prevailing patterns of mortality at the time of his/her life. In line with economic theory, it is expected that Life expectancy at birth determine in part the level of economic growth in Nigeria. This is because as the living condition improves, human longevity is expected to be enhanced and vice-versa. This is achieved when there is improvement in health expenditure thus, increase life expectancy rate.

Sources of Data and Measurement

This empirical study relied on secondary data to estimate the specified models of the work. Data were collected on GDP growth rate, fiscal and non-fis cal variables in the Nigeria economy spanning from 1981- 2013, a period of Thirty-three (33) years. The data used were sourced from the Central Bank of Nigeria (CBN) statistical Bulletin 2013 (various issues) and World Bank Development indicator (various issues).

All variables are expressed in logarithm form. The estimations were carried out using Econometric software package (E-views 7.1). The result of the equation estimated to verify the impact of Health expenditures on economic growth is presented in Table 1.

A-priori Economic proposition

Regarding the theoretical values of the parameters of the research model, a positive relationship is expected to exist among the Gross Domestic Product (GDP), Gross Capital Formation (GCF), Total Health Expenditure (THE), Secondary School Enrolment (SSE) and Life Expectancy Rate (LER).

Symbolically, the above identified economic expectations relationship are presented as follow:

$\beta_0 \neq 0$; $\beta_1 > 0$,............$\beta_4 > 0$

Estimation Techniques and ARDL Modelling Approach

The method of estimation employed for this study is based on Auto-regressive Distributed Lag (ARDL) Model approach and Error Correction Mechanism(ECM) model. The ARDL modelling approach popularised by Pesaran and Pesaran (1997), Pesaran and Smith (1998), Pesaran and Shin (1999), and Pesaran et al. (2001) has numerous advantages. The main advantage of this approach lies in the fact that it can be applied irrespective of whether the variables are I(0) or I(1) and that none of the variables is stationary at 1(2) and beyond (Pesaran and Pesaran 1997, pp.302- 303). Another advantage of this approach is that the model takes sufficient numbers of lags to capture the data generating process in a general-to-specific modelling framework (Laurenceson and Chai 2003, p.28). Moreover, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation (Banerjee et al. 1993, p.51). The ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information. It is also argued that using the ARDL approach avoids problems resulting from non-stationary time series data (Laurenceson and Chai 2003, p.28). This study illustrates the ARDL modelling approach by considering Equation iv:

$$GDP_{gt} = \beta_0 + \beta_1 GCF_t + \beta_2 THE_t + \beta_3 SSE_t + \beta_4 LER_t + \mu_t \quad \text{...} \ (vi)$$

Where: GDP, GCF, THE, SSE and LER are five different time series; μ_t is a vector of stochastic error terms; and β_0, β_1, β_2, β_3 and β_4 are the parameters. For the above equation, the error correction version of the ARDL model, as given in Equation v in line with Pesaran et al (2001)and Bahmani and Nasir(2004) modelling approach is:

$$\Delta Log(GDP)_{gt}=\beta_0+\sum_{i=0}^{n}\beta_{1i}\Delta Log(GCF)_{t-i}+\sum_{i=0}^{n}\beta_{2i}\Delta Log(THE)_{t-i}+\sum_{i=0}^{n}\beta_{3i}\Delta Log(SSE)_{t-i}+\sum_{i=0}^{n}\beta_{4i}\Delta Log(LER)_{t-i}$$
$$+\beta_5 GCF_{t-1}+\beta_6 THE_{t-1}+\beta_7 SSE_{t-1}+\beta_8 LER_{t-1}+ECM(-1)_{t-1}+\mu_t \text{..............................(vii)}$$

The first part of equation (v) with β_1, β_2, β_3, and β_4 represents the short run dynamics of the model whereas the second part with β_5, β_6, β_7 and β_8 represents the long run relationship. The null hypothesis in the equation is $\beta_5= \beta_6= \beta_7= \beta_8 =0$, which means the non-existence of the long run relationship.

Specifically, the short-run ARDL model for this study is:

$$\Delta Log(GDP)_{gt}=\beta_0+\sum_{i=0}^{n}\beta_{1i}\Delta Log(GCF)_{t-i}+\sum_{i=0}^{n}\beta_{2i}\Delta Log(THE)_{t-i}+\sum_{i=0}^{n}\beta_{3i}\Delta Log(SSE)_{t-i}+\sum_{i=0}^{n}\beta_{4i}\Delta Log(LER)_{t-i}$$
$$+\Theta EC_{t-i}\text{...(viii)}$$

Where: Θ is the error correction term, indicating the speed of adjustment reverse to long run in the model. EC is the residuals that are obtained from the estimated ARDL co-integration model.

After ascertaining the short run relationship, we used the following equation to estimate the long-run coefficients:

$$Log(GDP)_{g\,t}= \beta_0+\sum_{i=0}^{n}\beta_{1i}Log(GCF)_{t-i}+\sum_{i=0}^{n}\beta_{2i}Log(THE)_{t-i}+\sum_{i=0}^{n}\beta_{3i}Log(SSE)_{t-i}+\sum_{i=0}^{n}\beta_{4i}Log(LER)_{t-i}$$
$$+\mu_t\text{...(xi)}$$

ARDL Model Testing Procedure

The ARDL model testing procedure starts with conducting the bound test for the null hypothesis of no co-integration. The calculated F-statistic is compared with the critical value tabulated by Pesaran and Pesaran (1997) or Pesaran et al. (2001). If the test statistic exceeds the upper critical value, the null hypothesis of no long-run relationship can be rejected regardless of whether the underlying orders of integration of the variables are zero or one. Similarly, if the test statistic falls below a lower critical value, the null hypothesis is not rejected. However, if the sample test statistic falls between these two bounds, the result is inconclusive. When the order of integration of the variables is known and all the variables are I(1), the decision is made based on the upper bound. Similarly, if all the variables are I(0), then the decision is made based on the lower bound. The ARDL method estimates $(p+1)^k$ number of regressions in order to obtain optimal lag length for each variable, where p is the maximum number of lag to be used and k is the number of variables in the equation. The model can be selected using the model selection criteria like Schwartz-Bayesian Criteria (SBC) and Akaike's Information Criteria (AIC). SBC is known as the parsimonious model: selecting the smallest possible lag length, whereas AIC is known for selecting the maximum relevant lag length. In the second step, the long run relationship is estimated using the selected ARDL model. When there is a long run relationship between variables, there exists an error correction representation. Therefore, in the third step, the error correction model is estimated. The error correction model result indicates the speed of adjustment back to the long run equilibrium after a short run shock. To ascertain the goodness of fit of the ARDL model, the diagnostic test and the stability test are conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroscedasticity associated with the model.

The structural stability test is conducted by employing the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ). Examining the prediction error of the model is another way of ascertaining the reliability of the ARDL model. If the error or the difference between the real observation and the forecast is infinitesimal, then the model can be regarded as best fitting.

ANALYSIS

The study examines the characteristics of the variables used to establish whether or not the variables are stationary at level; and if not whether or not stationarity can be induced by differencing the variables once or twice. Unit Root Tests Table 1 shows the unit root tests using the ADF Unit Root Test.

The series includes the Gross Domestic Product, Total Health Expenditure, Life Expectancy Rate, Secondary School Enrolment and Gross Capital Formation. All variables are expressed in natural logs. From the casual inspection of the series, two of the series exhibit some non-stationarity. The unit root test suggests that three of the variables are integrated of order one and they are stationary at first differences while others are integrated of 1(0) and stationary at levels.

Table 1. Result of stationarity Test on variables using ADF (Output on E-views 7.1)

VARIABLES	AT LEVEL ADF	1ST DIFFERENCE ADF	C.V 5%	C.V 1%	ORDER OF INTEGRT.	REMARK
LGDP	2.563853	-3.991920	-2.967767	-3.679322	1(1)	S
LTHE	5.45104	-	-2.971853	-3.689194	1(0)	S
LLER	1.386865	-5.193265	-2.960411	-3.661661	1(1)	S
LSSE	-0.003208	-3.036541	-2.967767	-3.679322	1(1)	S
LGCF	-3.836836	-	-2.960411	-3.661661	1(0)	S

Following Pesaran and Pesaran (1997) procedure. However, ADF unit root test for this study confirmed that all variables in the research model are stationary at 1(0) or 1(1) and that none of the variables is stationary at 1(2) and beyond, therefore the use of ARDL estimation method is informed. We started the estimation of the ARDL model with Wald test F-statistic) to test for the joint (overall) significance of the coefficients of all the variables. Therefore, the decision rule for accepting or rejecting the null hypothesis of the calculated F-statistic value is based on the tabulated critical lower and upper bounds values supplied by Pesaran et al (2001)

Results of the Wald Bounds Test of Co-integration ARDL

The test was carried out according Pesaran et al (2001) to ascertain the significance of the variable using the Wald coefficient test and the result is presented as follows:

Table 2. Wald Test Result

ARDL Bounds Test
Date: 12/02/15 Time: 00:08
Sample: 1983 2013
Included observations: 31
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	42.81959	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Test Equation:
Dependent Variable: D(GDP)
Method: Least Squares
Date: 12/02/15 Time: 00:08
Sample: 1983 2013
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LER)	-5009736.	425795.6	-11.76559	0.0000
D(SSE)	-935336.6	252439.0	-3.705198	0.0014
D(SSE(-1))	356596.7	259070.6	1.376446	0.1839
D(THE)	166.6749	23.36412	7.133796	0.0000
D(THE(-1))	-249.7182	55.96400	-4.462123	0.0002
C	1.08E+08	48654617	2.226146	0.0377
GCF(-1)	-8368.675	17687.30	-0.473146	0.6412
LER(-1)	-2112938.	1042435.	-2.026926	0.0562
SSE(-1)	-413496.3	197483.6	-2.093826	0.0492
THE(-1)	464.0929	109.3971	4.242279	0.0004
GDP(-1)	-0.795607	0.186252	-4.271665	0.0004

R-squared	0.966510	Mean dependent var	1364379.
Adjusted R-squar...	0.949765	S.D. dependent var	8216632.
S.E. of regressio...	1841615.	Akaike info criterion	31.96161
Sum squared res...	6.78E+13	Schwarz criterion	32.47044
Log likelihood	-484.4049	Hannan-Quinn criter.	32.12747
F-statistic	57.71884	Durbin-Watson stat	2.007125
Prob(F-statistic)	0.000000		

Table 2 reveals that the calculated F- statistic of 42.81959 is higher than the upper bound critical value of 3.49 at 5% error level. Based on this report, that is Cal $_{42.81}$ > Tab $_{3.49}$ at 5% level. Therefore, we conclude that there is an evidence of long-run relationship between LGDP (economic growth) and the set of variables of health expenditure in Nigeria. The null hypothesis of no co-integration is therefore rejected.

The result from the Table 3 below shows that all the lag length selection criteria suggest a maximum of three lags for the ARDL model in this study. A key assumption in the ARDL bound testing methodology of Pesaran et al (2001) is that the errors of the equation must be serially independent. The validity of the chosen three lag lengths for the study was therefore tested using the Lagrange Multiplier (LM) test of serial correlation (Table 4).

Table 3. Lag Length Selection Criteria

Endogenous variables: GDP THE LER SSE GCF
Exogenous variables: C Included observations: 28

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1045.219	NA	2.61e+26	75.01562	75.25351	75.08835
1	-946.1345	155.7037	1.36e+24	69.72389	71.15125	70.16025
2	-887.1379	71.63873	1.45e+23	67.29556	69.91239	68.09555
3	-842.2252	38.49659*	6.10e+22*	65.87323*	69.67953*	67.03685*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)

Table 4. Residual Serial Correlation LM Result Tests

Lags	LM-Stat	Prob
1	34.98091	0.0885
2	34.17421	0.1042
3	18.50048	0.8204
4	24.62863	0.4833
5	26.87595	0.3621
6	41.29278	0.0214
7	38.07455	0.0455
8	23.91859	0.5241
9	31.52291	0.1723
10	48.46648	0.0033
11	38.47759	0.0415
12	48.76841	0.0030

Probs from chi-square with 25 df.

Table 4 above shows that the conducted LM test indicates no traces of serial correlation at 5% levels of significance. To avoid multicollinearity therefore, a maximum of the 3-lag length is selected for the study.

Granger Causality Test

In an attempt to ascertain whether causality exist in the reverse direction among the variables and more importantly to find out if the relationship between the economic variables is spurious or nonsensical, we had to conduct Granger Causality test on GDP,THE ,LER, SSE and GCF. The result is presented in Table 5 below.

Table 5 pair-wise Granger Causality Test

Sample: 1981 2013
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
THE does not Granger Cause GDP	29	5.41661	0.0061
GDP does not Granger Cause THE		34.2584	2.E-08
LER does not Granger Cause GDP	30	13.0892	3.E-05
GDP does not Granger Cause LER		8.70837	0.0005
SSE does not Granger Cause GDP	30	2.85462	0.0594
GDP does not Granger Cause SSE		6.25612	0.0029
GCF does not Granger Cause GDP	29	1.22490	0.3243
GDP does not Granger Cause GCF		0.18129	0.9080
LER does not Granger Cause THE	29	21.2782	1.E-06
THE does not Granger Cause LER		2.48351	0.0875
SSE does not Granger Cause THE	29	0.13911	0.9355
THE does not Granger Cause SSE		15.2234	1.E-05
GCF does not Granger Cause THE	28	1.37263	0.2785
THE does not Granger Cause GCF		0.07999	0.9702
SSE does not Granger Cause LER	30	2.38495	0.0954
LER does not Granger Cause SSE		0.98172	0.4186
GCF does not Granger Cause LER	29	2.04598	0.1367
LER does not Granger Cause GCF		1.01171	0.4064
GCF does not Granger Cause SSE	29	1.96274	0.1491
SSE does not Granger Cause GCF		0.23897	0.8682

The results alternated between bi-directional, no causality and uni-directional, depending on the lag length allowed. The outcome in respect of three-lag length is presented in Table 5 above.

The results suggest that the direction of causality is from Total health expenditure to GDP growth and from GDP growth to Life expectancy rate since the estimated F-statistic is statistically significant at the 5 percent level. This indicates that Total health expenditure and Life expectancy rate has effect on the economic growth in Nigeria. However, there is no ‘reverse causation' from Secondary school enrolment to GDP growth since the estimated F-statistic is statistically insignificant. Also, there is no discernable relationship between GDP growth and Gross capital formation. This shows that economic growth is not determined by Secondary school enrolment and Gross capital formation. This confirms that Secondary school enrolment and Gross capital formation has no effect on the economic growth in Nigeria.

Table 6. Auto-regressive Distributed Lag Estimates

Dependent Variable: D(GDP)
Method: Least Squares
Sample (adjusted): 1986 2013
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.85E+08	3.29E+08	0.865913	0.4118
THE(-1)	80.61607	525.2166	0.153491	0.8818
LER(-1)	-6425282.	7205381.	-0.891734	0.3986
SSE(-1)	407812.8	664367.5	0.613836	0.5564
GCF(-1)	49321.31	103221.7	0.477819	0.6456
D(GDP(-1))	-0.498781	0.560186	-0.890384	0.3992
D(GDP(-2))	0.962813	0.676633	1.422948	0.1926
D(GDP(-3))	0.325053	1.359054	0.239176	0.8170
D(THE(-1))	82.33905	469.9799	0.175197	0.8653
D(THE(-2))	113.8542	407.1767	0.279619	0.7869
D(THE(-3))	-652.0753	473.9438	-1.375849	0.2062
D(LER(-1))	12676436	6013654.	2.107942	0.0681
D(LER(-2))	11242191	6810388.	1.650742	0.1374
D(LER(-3))	836887.6	5429461.	0.154138	0.8813
D(SSE(-1))	-270950.1	886005.0	-0.305811	0.7676
D(SSE(-2))	-470982.4	824302.5	-0.571371	0.5834
D(SSE(-3))	895021.7	724963.9	1.234574	0.2520
D(GCF(-1))	-74857.99	85805.84	-0.872411	0.4084
D(GCF(-2))	-57252.63	64392.48	-0.889120	0.3999
D(GCF(-3))	9810.684	55966.24	0.175296	0.8652

R-squared	0.950505	Mean dependent var	1509363.
Adjusted R-squared	0.832954	S.D. dependent var	8648077.
S.E. of regression	3534582.	Akaike info criterion	33.16990
Sum squared resid	9.99E+13	Schwarz criterion	34.12147
Log likelihood	-444.3786	Hannan-Quinn criter.	33.46080
F-statistic	8.085885	Durbin-Watson stat	1.485203
Prob(F-statistic)	0.002549		

Table 7. Error Correction Representation of ARDL Model

Dependent Variable: D(GDP)
Method: Least Squares
Date: 07/29/15 Time: 23:00
Sample (adjusted): 1985 2012
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	174709.4	600560.8	0.290910	0.7754
D(THE)	196.0369	63.54824	3.084852	0.0081
D(LER)	-3903484.	546389.2	-7.144147	0.0000
D(SSE)	-536317.9	395811.5	-1.354983	0.1969
D(GCF)	11565.88	27473.45	0.420984	0.6802
D(THE(-1))	74.17945	73.61985	1.007601	0.3307
D(THE(-2))	140.4055	116.6448	1.203701	0.2487
D(LER(-1))	1536291.	1494970.	1.027640	0.3215
D(LER(-2))	51663.31	1457665.	0.035443	0.9722
D(SSE(-1))	408549.1	393969.7	1.037006	0.3173
D(SSE(-2))	-347685.8	293404.1	-1.185007	0.2557
D(GCF(-1))	-15208.35	19487.61	-0.780412	0.4481
D(GCF(-2))	-7331.510	25482.94	-0.287703	0.7778
ECM(-1)	-0.409107	0.216472	-1.889881	0.0797

R-squared	0.966135	Mean dependent var	1443851.
Adjusted R-squared	0.934690	S.D. dependent var	8652327.
S.E. of regression	2211181.	Akaike info criterion	32.36280
Sum squared resid	6.85E+13	Schwarz criterion	33.02891
Log likelihood	-439.0793	Hannan-Quinn criter.	32.56644
F-statistic	30.72386	Durbin-Watson stat	1.749640
Prob(F-statistic)	0.000000		

The coefficient of most importance in Table 7 is the ECM coefficient. The statistical value of the lagged error correction model (ECM) is significant at 10% level with the expected negative sign. The ECM coefficient is -0.409107 which indicates approximately 40.91% of the previous year's disequilibrium in economic growth (GDP). This shows the speed at which the model converges to equilibrium.

In this study, the negative value of the ECM coefficient (-0.409107) confirms that there is disequilibrium in the short-run which the set of variables in the model are trying to correct in the long-run. The magnitude of this ECM coefficient implies that nearly 40.91% of any disequilibrium in the economic growth (LGDP) is corrected by the exogenous variables within one period (one year). The adjustment speed is very slow. The result confirms the existence of a long-run equilibrium relationship in the research model as indicated in the Wald test (Bannerjee and Mestre, 1998).

The Table 7 further confirmed that Life expectancy rate (DLER) has negative significant impact on economic growth at 1% level while secondary school enrolment (DSSE) also has negative but not significant impact, even at 10% indicating that the variable has little short-run effect on economic growth. The study also reveals that neither the coefficients of current and previous of the secondary school enrolment nor the gross capital formation variables are significant at 5 per cent. They are insignificant. This indicates that these lags between the secondary school enrolment and the gross capital formation variables have relatively low impacts on economic growth in Nigeria.

Post Estimation Analyses

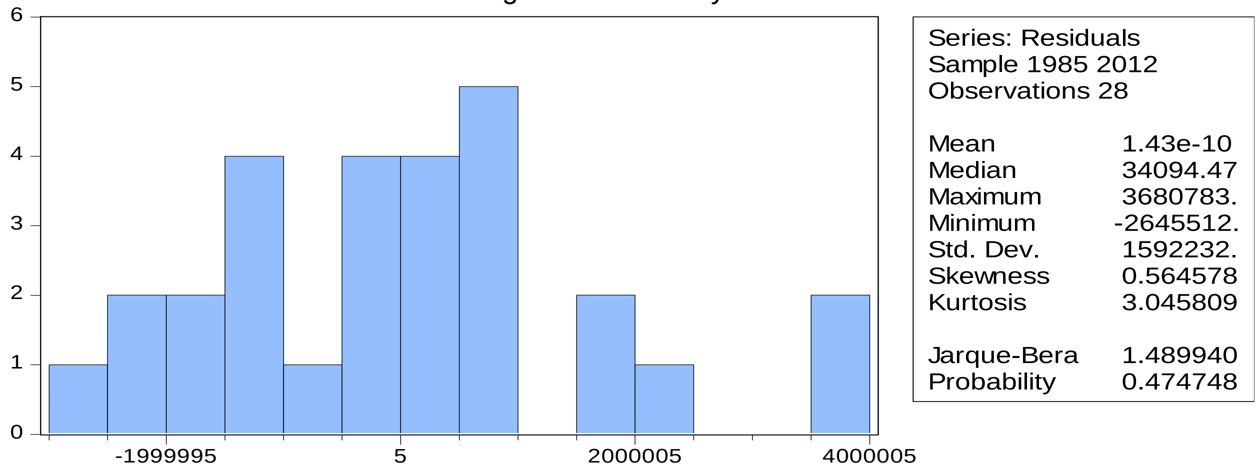
This section examines the usefulness, robustness and reliability of the estimated models by conducting diagnostic tests. Basic diagnostic tests such as serial correlation test, heteroskedasticity test and normality test were conducted. The results are shown in Table 8 and 9 below respectively:

Table 8: Diagnostic Tests of the ARDL model

S/N	TEST	F-Statistic	P-Value
1	Serial Correlation Test: Breusch-Godfrey Serial Correlation LM Test	5.214657	0.0535
2	Heteroskedasticity Test: ARCH LM Test	0.450281	0.7198

Correlation LM Test. From the B-G results, the hypothesis of zero autocorrelation in the residuals was not rejected. This was because the probability value of 0.0535 is greater than 5%. Therefore, the Breusch-Godfrey serial correlation LM test did not reveal serial correlation problems for the model. Also, ARCH LM test was conducted to test for heteroskedasticity. The result shows probability of 0.7198 which is in excess of 0.05. This leads to the rejection of the presence of heteroscedasticity in the residuals. Summarily, the diagnostic tests reveal that the residuals are serially uncorrelated and homoskedastic based on Breusch-Godfrey serial correlation LM test and ARCH LM test respectively. It can therefore be deduced that the model is valid and can be used for policy making without re-specification.

Figure 1. Normality Test

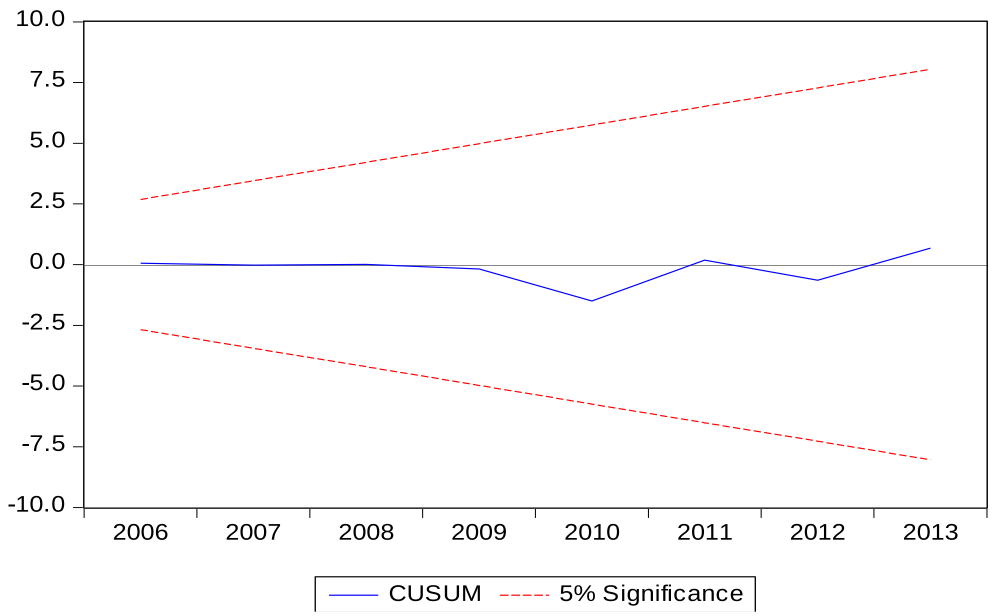


The Jarque-Bera Test result of normality is contained in Figure 1. The result revealed that the residuals of the data are normally distributed. The null hypothesis of normality of the residuals of the data is accepted at 47.47 per cent confidence level as indicated by the probability value of 0.4747 and Jarque-Bera value of 1.4899 which is greater than zero.

Stability Test-Plot of CUSUM

The plots of the stability test results (CUSUM) of the ARDL model are given in Figure 2. The CUSUM plotted against the critical bound of the 5 % significance level show that the model is stable over time for the CUSUM as shown below. That is, the model is within the bound.

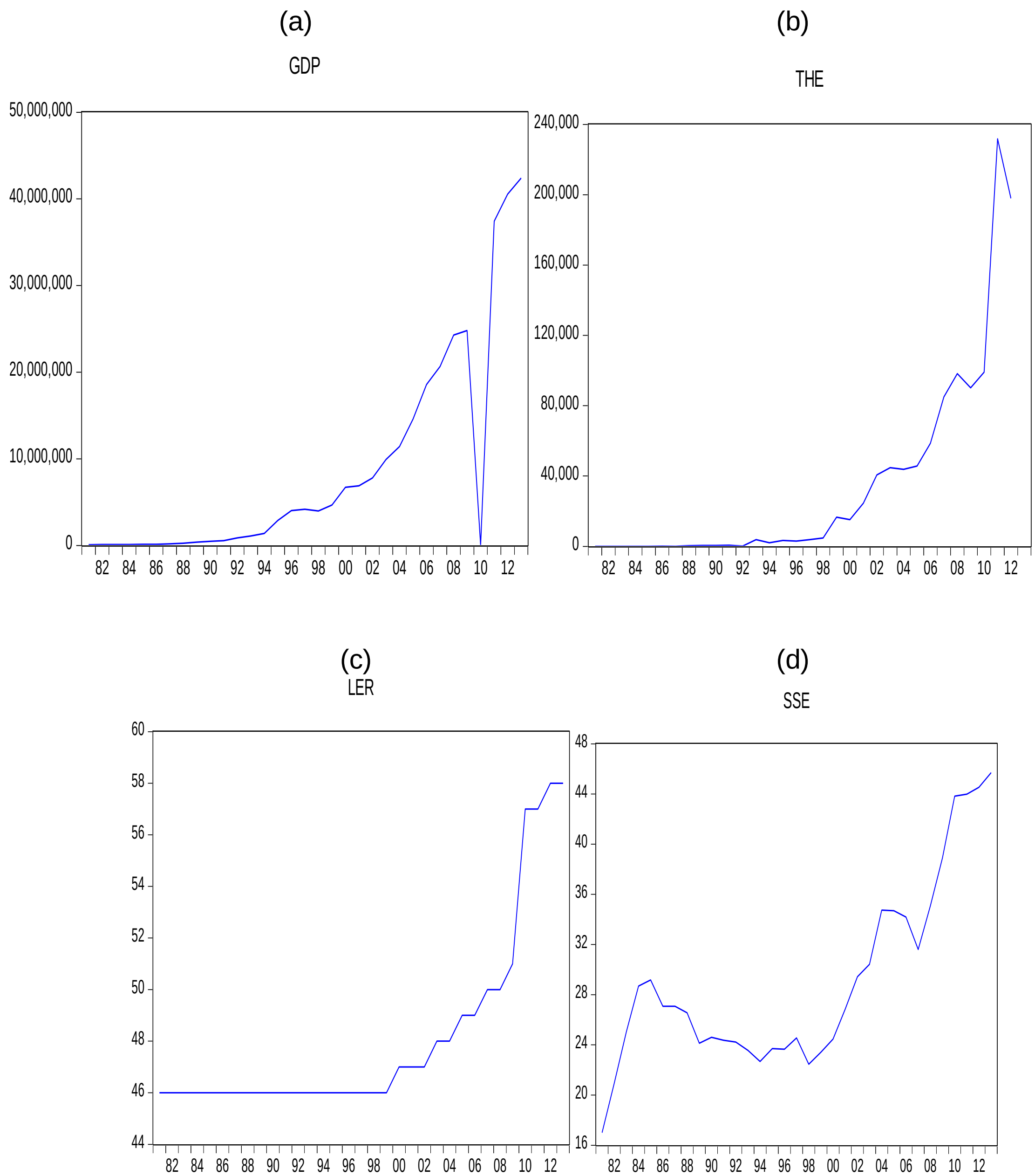
Figure 2: Plot of Cumulative Sum of Recursive Residuals



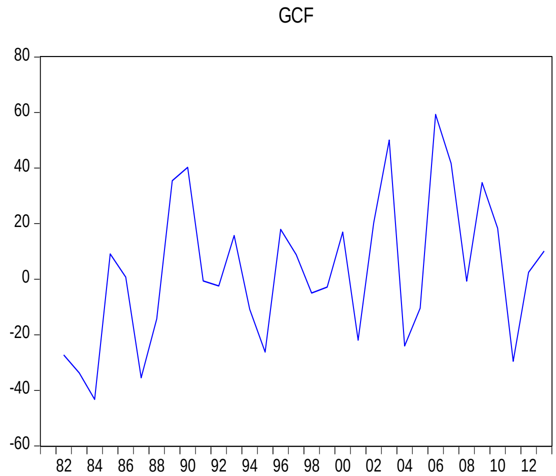
Trend Analysis

Figures below represent the illustrated trend analysis of the series in the model so as t o capture the objective one of the study. Fig. 3(a), Fig(c),and Fig (d), shows an upward trend in Gross Domestic Product (GDP)),Life Expectancy rate(LER) and Secondary School Enrolment(SSE), while Fig(b) and Fig(e) shows no trend in Total Health Expenditure(THE) and Gross Capital Formation(GCF) during the period under consideration (1981-2013) as diagrammatically depicted below:

Figure 3. Trend Analysis



(e)



CONCLUDING REMARKS

This study provides empirical justification to examines the im pact of health expenditure on economic growth in Nigeria. The study employed Augmented Dickey-Fuller (ADF) test of unit root to ascertain the state of stationarity level of the variables employed in the study. The Auto-regressive Distributed Lag (ARDL) model approach to co-integration was employed as estimation techniques in the study to ascertain the long run affiliation between variables while the error correction mechanism (ECM) was also employed to establish the short run dynamic relationships among the variables. Again, the Granger causality test was employed to established the causation between Economic growth (GDP) and THE, LER, SSE and GCF. In the same vein, the ECM result showed that its coefficient is correctly signed and statistically insignificant. The results from the stationarity tests indicated that all the variables in the research model for testing the dynamic relationship in the study were stationary at level or/and at first difference, and that none of the variables was stationary at second difference and beyond. Thus, the used of the Auto-regressive distributed lag (ARDL) estimation technique was therefore informed.

The bound test revealed that the calculated F-statistic (Wald test) of 92.02411 is higher than the Pesaran's upper bound critical value of 4.193 at 5% error level and therefore suggested that all the variables of interest in the research model are bound together in the long-run. The associated equilibrium error correction coefficient of the study was -0.409107 (about 41%). The result confirms the existence of long-run relationship between health expenditure and economic growth in Nigeria, as indicated in the ARDL-Wald test analysis.

Specifically in agreement with the a-priori theoretical expectation of this study, we observed that there existed positive long-run relationship between Total health expenditure, Gross capital formation and Economic growth in Nigeria, that the identified variables are found to be important determinant of output expansion in the country while negative long-run relationship existed between Life expectancy rate and the growth of Nigeria Economy, that also the identified variable indicates output reduction in the country. However, contrary to the a-priori expectation, there is a insignificant inverse long-run relationship between secondary school enrolment and economic growth in Nigeria including the lag variables. There is also existed a insignificant inverse relationship between Gross capital formation for both current and previous years and Economic growth in Nigeria.

Meanwhile, the analysis did not fail in the establishment of the variables that causes the changes that occur in gross domestic product using the Granger causality test. The test revealed that secondary school enrolment (SSE) and Gross capital formation (GCF) as the major causes of any changes in Gross domestic product (GDP) while the effect of these changes now result a consequent cause of changes in the other variables identified. This therefore indicates that Total health expenditure (THE) and Life expectancy rate (LER) changes are caused Gross Domestic product (GDP) with the unidirectional relationship shown in the Granger causality result. Although, not all explanatory variables show statistical significance and causation of GDP of a nation, but nevertheless there is still significant (direct or cross) that cannot be under-estimated between them all.

Finally, the result of feedback shocks from output growth confirmed that an increasing growth rate in GDP (Economic growth) in Nigeria predicts long-run expansion rates in Total health expenditure and Gross capital formation. Conclusively, the following policy recommendations will be proffers for this study:

(a) Firstly, since Gross capital formation and Total health expenditure enhance the level of economic growth in the study. Hence, government should encourage savings and investments in the economy and increase expenditures on health provisions. Meanwhile, life expectancy and labour productivity does not impact positively on economic growth. Thus, government should be more sensitive to the issue of insecurity to lives and properties and induce the level of labour productivity (Oni, L. B., 2012) and Promote the rate of social and infrastructural development.

(b) Higher investment in health infrastructure and control of diseases that will reduce the death rate is needed to reduce the negative effect of the death rate on growth.

(c) Growth-oriented policies that would result in bringing about improvements in the health status of the population should be encourage by the government.

(d) Educational policies that can increase school enrolment should also be instituted by the government.

(e) Finally, effort should be made by the government to train more doctors based on its importance on life expectancy. Incentives should be provided to attract people to take up the medical profession.

LIMITATIONS OF THE CURRENT STUDY

It is obvious that this paper was focus on the impact of health expenditure on the growth of Nigeria economy using ARDL approach but in the process, the following shortcomings were encounter in the study. They are:

(i) It has not be an easy task to source for the statistical data from Central Bank of Nigeria(CBN) statistical bulletin. Getting adequate and appropriate data from their internet site, needs long awaited time and also demand time consuming and money.

(ii) There is also a difficulties of getting recent 2014 data for all the variables employed in the study from CBN and World Bank World Development indicators (WBWD) various issues, which prompt the periodicity of the study to stop in 2013 which eventually is not appropriate for health related issues of this nature.

SCOPE FOR FURTHER STUDY

Among the various empirical literature in this work, some have given comprehensive and useful insights into the impact of health expenditure on economic growth in Nigeria (in general and particular). Meanwhile, to the best of the researchers' knowledge, there has not been any study that applied any econometric model on the impact of health expenditure on the growth of Nigeria economy. This study intends to fulfil this scope/gap as contribution to knowledge and also for further study.

Also, most of these studies are carried out at the micro-level using single point survey rather than multiple points survey which creates inability to generate a health production function from a point survey, thus create scope for further study.

Another scope for further study is that, the possibility of reverse causation and endogeneity in the health-growth-poverty relationship had been neglected leading to what is generally regarded as specification bias.

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