EFFECTS OF PUBLIC AND HOUSEHOLD HEALTH EXPENDITURES ON ECONOMIC DEVELOPMENT IN NIGERIA

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Abstract
The paper examines the relative effects of public and household health expenditures on economic development in Nigeria during the period from 1981-2021. In doing this, a composite economic development index based on Seers development theory is computed, and the effects of public and household health expenditure on economic development are investigated within a framework of simultaneous equation system estimated using the three stage least square (3SLS) estimator. The empirical evidence indicates that the effect of public expenditure in health on economic development in Nigeria is not statistically significant. However, household (out-of-pocket) represented by private expenditure in health is found to contribute significantly to economic development in the country. Further evidence are that economic development is enhanced by improvements in per capita income and life expectancy. These findings suggest the need to enhance incomes of household so as to improve and ease their access to healthcare services which will boost their health status and productivity, thereby enhancing their contributions to economic development.

Keywords: Public Expenditure in Health, Household (Out-of-Pocket) Expenditure in Health, Economic Development, Three-stage Least Squares
JEL Codes: C30, C36, C38, H51, I15, I18

1. Introduction

Despite its vast resources and potential, Nigeria faces the formidable challenges of achieving inclusive and sustainable economic development. The persistence of high poverty rates, gaping income inequality, and the heightened unemployment necessitates the imperative for a comprehensive examination of potential contributing factors contributing to these challenges. Therefore, within this analytical framework, healthcare emerges as a critical determinant that can influence both the social fabric and economic dynamics of the country. However, the contribution of public and household health expenditures to economic development emanates from the health led growth hypothesis (Piabuo & Tieguhong, 2017). It considers health to be a form of capital; therefore investments on health can lead to an increase in labour productivity, thus increase in incomes and subsequent increase in the wellbeing of the population. Health is an important determinant of economic development; a healthy population means higher productivity, thus higher income per head. Sound health is crucial to human well-being, a measure of increased productivity and total economic growth and development. It is also a driving force on which human capital such as education and skill rely on (Olayiwola, & Olusanya, 2021). Globally, healthcare especially child health is identified as a core factor for long-run economic development (Eboh, Aduku, & Onwughalu, 2022).

Health also occupies an important position in the Sustainable Development Goals (SDGs) by the United Nations (UN). Goal 3 of the SDGs in particular, focused on a considerable reduction in the global maternal and child mortality rates and a significant increase in health financing by the year 2030 (WHO, 2016). However, by allocating resources to healthcare, governments aim to enhance the overall health status of the population and create a healthier workforce, which can result in higher productivity and economic progress. Health and well-being are seen both as drivers of sustainable development and outcomes (WHO, 2018). Hadir and Lahrech (2015) see humans as the most valuable asset. Makuta and O'Hare (2015) argued that improved health outcome is a prerequisite for development, given that good health is an important form of human capital. Understanding the interplay and underlying link between public and household health expenditure and economic development is critical in forecasting the wellbeing of a nation.

Household expenditures on health otherwise known as out-of-pocket (OOP) health expenditures are defined as formal and informal payments made at the time of getting any type of care (preventive, curative, rehabilitative, palliative or long-term care) provided by any type of provider. These payments include the part not covered by a third party such as the government, health insurance fund or private insurance but exclude insurance premiums as well as any reimbursement by a third party. They might be financed by income, including remittances, savings or borrowing. With this definition, health expenditures are labelled out-of-pocket (OOP) payments in the classification of healthcare financing schemes (HF) of the international Classification for Health Accounts (ICHA) WHO, 2021). Out-of-pocket payments are expenditures borne directly by a patient where neither public nor private insurance cover the full cost of the health good or service (Yildirim, Yilmaz, & Korucu, 2011; Malik & Syed, 2012).

Household health expenditure is important because it reflects the financial burden that individuals bear for their health needs and such reduces their overall well-being. Invariably, such burden from out-of-pocket health spending can be the cause of household impoverishment. In many countries, including Nigeria, Out-of-pocket spending on health care accounted for a substantial portion of household expenditure among financing mechanisms. To ensure health care is accessible to all, the World Health Organization (WHO) launched the Universal Health Coverage (UHC). An important aspect of achieving UHC is to promote a financial risk pooling system and move from out-of-pocket expenditure to prepayment mechanisms such as Community Based Health Insurance (CBHI), (Indrani, 2021; Ashley, Ashley, & Cruz, 2022).

According to World Health Organization (2020), out-of-pocket health expenses can create financial hardship by forcing people to choose between health expenses and other necessities, especially when they exceed a pre-defined threshold of the household ability to pay. When such happens, they are characterised as being catastrophic. Health spending is considered catastrophic when a household has to reduce other spending to compensate for health expenditure. Catastrophic health expenditures can be calculated as the proportion of total income or effective income spent out-of-pocket on health care (Wang, Temsah, & Carter, 2016). The increasing proportion of the population spending over 10% of their household income on medical care, rising from 9.4% in 2000 to 12.7% in 2015, underscores a concerning trend in healthcare affordability (Sirag & Nor, 2021). This upward trajectory indicates a growing financial burden on households, with a substantial segment allocating a significant portion of their income to medical expenses. Such an escalation may signify challenges in healthcare accessibility and affordability, potentially leading to adverse consequences such as delayed or foregone medical treatment, financial strain, and an increased risk of impoverishment for affected households. Addressing this trend requires a comprehensive approach to healthcare financing and policy measures aimed at mitigating the financial impact on individuals and promoting equitable access to necessary medical services.

Health as one of the critical sectors of the economy has continued to generate interest for several decades because of its indispensable role in the social and economic development of a nation. In Nigeria, though budgetary allocation to the health sector has tended to trend upwards between 2001 and 2021, yet its share in the total budget has been pitiably low. Moreover, budgetary allocation to the sector has always been characterised by the dominance of recurrent spending over capital spending (Federal Ministry of Health, 2021). Out-of-pocket health expenditure (also referred to as private health expenditure) recently began to

trend downwards as a result of government policy interventions in the health sector which are aimed at making healthcare services affordable and easily accessible. These have some implications for the country's economic development. To this end, the objectives of this paper are to investigate the effects of public health expenditure and household health expenditure on economic development in Nigeria.

For ease of presentation, the paper is organised into five sections. The current section (Section 1) introduces and motivates the study. A comprehensive review of the literature (conceptual, theoretical and empirical) is presented in Section 2. The gaps in the literature and expected contribution to extant knowledge are also highlighted in this section. The methodology of the study is presented in Section 3, while the results and their implications are presented and discussed in Sections 4. Section 5 concludes the paper with some policy recommendations and suggestions for further studies.

2. Literature Review
2.1. Conceptual Review
2.1.1. Economic Development

The concept of economic development is a vast, complex and multifaceted process that has been defined in various ways, depending on the perspective of the scholars/economists and the time period in which they wrote. There is no one-size-fits all answer to the concept of economic development as there are a wide range of views on economic development in developing countries. Thus, economic development encompasses several factors, including infrastructure development, industrialization, education, health, and social welfare. However, economists define economic development in different ways, including industrialization, economic growth followed by change, achievements of ideals of modernization, or even economic independence. Thus, Ndongko (1986) defines development as a "sustained, secular improvement in material wellbeing which may be reflected by an increasing flow of goods or services which are distributed to all members of the society in an acceptable manner considering the existing social, cultural, and political framework." However, he mentions that in order to achieve such a state of development, there should be an economic growth that has to precede the redistribution of social welfare; otherwise, there is no possible development (Ndongko, 1986 as cited in Nzima, 2014).

Economic development is the sustained, concerted actions of policy makers and communities that promote the standard of living and economic health of a specific area. Economic development can also be referred to as the quantitative and qualitative changes in the economy. Such acts can involve multiple areas including development of human capital, critical infrastructure, regional competitiveness, social inclusion, health, safety, literacy and other initiatives. Economic development differs from economic growth. Whereas economic development is a policy intervention endeavour with aims of economic and social well-being of people, economic growth is a phenomenon of market productivity and rise in GDP. Consequently, as economist Amartya Sen points out, "economic growth is one aspect of the process of economic development". Sen emphasizes the importance of human capabilities and freedoms in economic development. He defines economic development as "the process of expanding the real freedom that people enjoys," which includes not just income and wealth but also access to education, health care and other basic needs (Sen, 1983).

Economic development encompasses progress in providing livelihood on a sustainable basis, access to education and basic healthcare for the majority of the population (Belshaw & Levingstone, 2002). Consequently, Kayode and Odusola (2001) see development as a process that results in improved economic status for a country. Todaro and Smith, (2012) refer to development as the process of improving the quality of all human lives and capabilities by raising people's levels of living, self-esteem, and freedom. In economic terms, development has been understood as achieving sustainable rates of growth of per capita income to enable the nation to expand its output faster than the population (Todaro & Smith, 2012).

According to the United Nations Development Programme (UNDP, 1990), development should focus on human development. The UNDP argument stresses that economic growth must be managed and wealth distributed for the benefit of the majority of the country's people. Central to this process of human development is the enlargement of people's choices, most crucially in the areas of being able to live long

and enjoy healthy lives, to have access to education and to varied resources needed for a decent standard of living. On the basis of this reasoning, the UNDP (1992) evolved the HDI, including component variables such as the standard of living measured by purchasing power parity based on real GDP; knowledge by adult literacy and more years of schooling; and longevity measured by life expectancy. Essentially, development is the increasing ability of a given society to productively manipulate her environment. This entails a rising level of social and scientific consciousness, and advancement in science and technology for the society in question (Adenuga, 2003, and Uzoigwe, 2007). However, despite being used widely and being recognized as a reliable indicator of economic development, the HDI is not without criticism.

These definitions fail to take into consideration the problems of poverty, discrimination, unemployment and income distribution; the assumption being that increased output or economic growth would deal with these issues. It is worth mentioning that there is no guarantee that when there is increase in GNP, employment will also increase. It can happen that with the use of more capital- intensive techniques, while productivity may be rising at a rapid rate, employment may be declining instead of rising. In addition, the critics of HDI argue that the equal weighing between the three components used in HDI is rather arbitrary and it excludes many aspect of economic and social life that could be regarded as contributing to development as mentioned earlier such as there is no indication of the distribution of income, deprivation, freedom, among others.

However, previously, many economists see economic development as an increase in a country's Gross Domestic product or per capita income, agriculture, industrialization, innovation. Dudley Seers, a British economist, provided a comprehensive framework for understanding economic development. In 1969, Dudley Seers signaled this shift about the meaning of development succinctly by asking the following questions about a country's development:

What has been happening to poverty? What has been happening to unemployment? What has been happening to inequality? If all three of these have become less severe, then beyond doubt this has been a period of development for the country concerned. If one or two of these central problems have been growing worse, especially if all three have, it would be strange to call the result "development," even if per capita income has soared. (Seers, 1969). He argues that economic development must be sustainable and equitable. More so, this shift is critical to increasing productivity, creating new job opportunities, and boosting economic growth.

According to Seers, economic development is not all about increasing a country's GDP or per capita income. Instead, it is about improving the overall well-being of the people. He highlighted the importance of structural transformation in economic development.

2.1.2. **Public Health Expenditure**

Public health expenditure refers to the financial resources invested by the government to promote and maintain the health of its citizens. Government spending as a fiscal instrument serves useful roles in the process of controlling inflation, unemployment, depression, balance of payment equilibrium and foreign exchange rate stability. In the period of depression and unemployment, government spending causes aggregate demand to rise and production and supply of goods and services follow the same direction. As a result, the increases in the supply of goods and services couple with a rise in the aggregate demand exalt a downward pressure on unemployment and depression (Murtala & Taiwo, 2011).

World Bank (2014) defines public health expenditure as covering the provision of health services (preventive and curative), family planning activities, nutrition activities and emergency aid designated for health but does not include provision of water and sanitation. Public health expenditures is one of the capital expenditures and are investments with multiplier effects on the economy and general government expenditures on health comprises the direct outlays earmarked for the enhancement of the health status of the population and/or the distribution of medical care goods and services among population by the following financial agents: central/federal, state/provincial/regional, and local/municipal authorities; extra budgetary agencies, social security schemes; parastatals. All can be financed through domestic funds or through external resources.

WHO (2010, 2015) defines public health expenditure as a measure of final consumption of health goods and services including capital investment in healthcare infrastructure. Health therefore is a critical component of improving the living standard of people and when integrated to other socio-economic infrastructure becomes necessary for the growth and development process of the economy. Public health expenditure is understood as building the productivity capacity of not only the labour force of the economy but also the sustainability base of the economy by way of healthy infants and children.

2.1.3. Household Health Expenditure

Household out-of-pocket payment' means a direct payment for healthcare goods and services from the household primary income or savings, where the payment is made by the user at the time of the purchase of goods or the use of the services. Household health expenditure refers to the financial resources that household allocate to healthcare services, treatments, medications, and other health-related expenses. It provides insights into the financial burden that healthcare places on individuals and families.

Broadly, out of pocket expenditure is any direct outlay by households, including gratuities and in-kind payments, to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or enhancement of the health status of individuals or population groups. It is a part of private health expenditure. Out-of-pocket payments are expenditures borne directly by a patient where neither public nor private insurance cover the full cost of the health good or service. They include cost-sharing and other expenditure paid directly by private households and should also in principle include estimations of informal payments to health care providers (Yildirim, Yilmaz, & Korucu, 2011; Malik & Syed, 2012).

2.2. Theoretical Literature
2.2.1. Theories of Government Expenditure

Explaining the phenomenon of the growth of government expenditure has always been a wide field in the science of Public Finance. The aim of those theories is not only to explain government growth but also to find solutions in order to distribute public expenses more efficiently and to finally derive the "optimal" size of the government. In the past few decades, many economists have formulated different theories on public expenditure as it relates to economic growth which is the major theorist that associates growth-development with government expenditure. Therefore, this section is focused on reviewing basic theories that relates public health expenditures to economic growth and development. Notable theories are as follows:

Wagner (1893) developed a "law of increasing state activity". He stated that government expenditure rises at a faster rate than the output of the economy. He derived it after empirical analysis on Western Europe industrializing countries at the end of the 19th century. The law posits a positive correlation between the level of economic development and the scope of government expenditure (Henrekson, 1993). In other words, according to this law as an economy develops over time, the activities or functions of the government increases. He asserted that there is a long run propensity for the scope of government to increase with higher levels of economic development.

Wagner argued that government growth is a function of increased industrialization and economic development. Wagner stated that during the industrialization process, as the real income per capita of a nation increases, the share of public expenditures in total expenditures increases. The theory establishes a linkage from industrialization, urbanization and education to the expansion of the public sector. The theory explains that government expenditures on administration and regulation increase as an economy become more industrialized (Nyasha & Odhiambo, 2019).

According to Magazzino, Giolli and Mele (2015), Wagner's law stipulates that in the process of economic development, the share of the public sector in GDP has been increasing over time. Consequently, in the initial stage of economic growth, the state finds that it has to expand its activities quite fast in several fields like education, health, civil amenities, transport, communications, and so on. But when the initial deficiency is removed, then the increase in state activities may be slowed down.

Wagner designed three focal bases for the increased in state expenditure. Firstly, during industrialization process, public sector activity will replace private sector activity. State functions like administrative and

protective functions will increase. Secondly, governments needed to provide cultural and welfare services like education, public health, old age pension or retirement insurance, food subsidy, natural disaster aid, environmental protection programs and other welfare functions. Thirdly, increased industrialization will bring out technological change and large firms that tend to monopolize. Governments will have to offset these effects by providing social and merit goods through budgetary means.

2.2.2. Theories of Development
Four main theories have been used to explain the developmental trends registered by humanity in modern times. They include the classical economic theory, the neo-classical economic theory, the Index of Sustainable Economic Welfare (ISEW) and the Human Development Index (HDI) theories (Biao et al, 2014). Although these theories had their roots in Europe and Asia, they are applied worldwide to all regions and to all countries, including developing countries and African nations. Using these theories as measuring instruments, the developing world and Africa are today regions that have registered only low indicators of development. Although these theories have significant impact on the field of development, the study focuses on alternative theories more pertinent to developing countries, such as these three development theories: Human Development Index theory, Beyond Human-centered theories of development, and Dudley Seers' theory of development.

i) The Human Development Index Theory
According to Biao (2011), Mahbub ul Haq and Armatya Sen were the originators of the Human Development Index (HDI) in 1990; HDI was designed to measure life expectancy, literacy-education and standard of living (UNDP, 2013). In other words, if any society made appreciable progress on these indicators, it will be seen as having attained some level of social and economic development. The United Nations Development Programme (UNDP) currently categorizes nations as very high, high, medium or low using the Human Development Index indicators.

However, it is crucial to acknowledge that the HDI is not without criticism, and there are on-going debates about its limitations and the need for further refinements.

ii) Beyond Human-centered Theories of Development
The first step towards the actualization of a human-centered development programme is for the state or corporate entity to first accumulate capital and technologies with the view to using same for the provision of health schemes, nutritional regimes, educational systems that will eventually permit citizens to access longevity, quantitative and/or qualitative education, sustainable environment and high or acceptable standard of living (Biao, 2011). Yet, not all societies may have access to the amount of capital that may help promote longevity, modern education and high standard of living to the level advocated by current human-centered development theories.

According to Nagan (2016), the idea of human-centered development implies that the normative priority given to economic development should have a specific focus on human being directly and not on abstraction. This emphasizes the primacy of human well-being and human rights in the process of economic development over abstract concepts or pursuing economic growth as an end in itself. In a broad sense, this implies that there is a normative global imperative that requires the acknowledgement and adoption of a human right to development.

Human-centered development theorists suggest that capital, international trade and size of national economy all play an important role in determining whether countries are developed or not, the indices of health, nutrition, life expectancy and education brought in as complementary parameters for assessing economic development, are socio-economic indicators that are easily and universally identifiable and measurable.

iii) Dudley Seers Theory of Development
The Dudley Seers theory of development, also known as the Seers' Three-Pillar Model, was proposed by Dudley Seers, a British economist, in the 1960s. Seers argued that development should not be solely measured by economic indicators, such as Gross National Product (GNP) or Gross Domestic Product (GDP) per capita growth, but should also encompass broader social and human aspects. His theory emphasized the

need for development to address poverty, inequality and unemployment. Consequently, in the absence of a consensus theory of economic development, consistent measurement was difficult. Seers (1969) shifted away from such believes and propounded his own theory of economic development which majorly emphasized on Poverty, Unemployment and Inequality reduction, which is the main focus of this study. This will take care of this major difficulty- 'capital'- having access to the amount of capital that may help promote longevity, modern education and high standard of living' as emphasized by the Human-Centered Theories of Development. Thus, this study used Seers' indicators known as Three-Pillars Model to critically assess the Nigeria development situation in order to ultimately create a more inclusive society. However, the development theoretical underpinning of this study is anchored principally on Dudley Seers (1969) theory of economic development since Nigeria is characterized by high poverty rate, unemployment and inequality, etc. which have been included in the analysis.

2.3. Empirical Literature

Many studies have examined the relationship between health expenditures and economic growth. Empirical investigations within this domain have frequently employed diverse economic metric, including but not limited to GDP growth, per capita income, and human development index (HDI), as proxies for assessing economic development. Nonetheless, the empirical investigation of the effect of public/household health expenditures on economic development remains relatively scarce within the extant literature.

Bakare and Sanmi (2011) investigated the relationship between healthcare expenditure and economic growth in Nigeria between 1970 and 2008. Data were analysed using OLS multiple regression analysis with GDP, health expenditure, gross capital formation and labour force as variables used in the study. The result showed a significant and positive relationship between health care expenditure and economic growth. The study recommended that the Nigeria government should continuously increase the percentage of budget allocation to health every year. The strength of this study derives from its scope and techniques of data analysis. It has relevance for the present study in the sense that it created insight into a possible outcome of the present study.

Mehrara and Musai (2011) studied the relationship between health expenditure and economic growth in Iran for the period 1970 to 2007. The autoregressive distributed lag (ARDL) approach was employed. The study found a co-integrating relationship between real GDP which is the dependent variable and health expenditure, capital stock, oil revenues and education as the independent variables. Thus, health spending accounts for just a small part of the economic growth. The findings of the study indicate that healthcare expenditures did not make a significant marginal contribution to the economic growth in Iran. The weakness of this study is the inclusion of variables which are not closely associated with health status of the citizens of a country. Howbeit, it finds relevance in the researcher's consideration of techniques of analysis.

Dauda (2011) carried out a study on "health as a component of human capital formation: Does it matters for the growth of Nigerian economy? The study covered the period 1970-2009. Data were analysed using co-integration and error correction model. The results sugges that a positive and significant long-run relationship exist between real GDP and life expectancy but the coefficient of the first and third lag indicate that there is negative and significant relationship between the two. The conclusion from the study is that health as a component of human capital formation matters for the growth of Nigerian economy. The policy implication of the findings is that the government should in addition to increasing expenditure on health, put in place mechanism to monitor how effective such funds are utilized for the purpose for which they are meant. A major weakness of this study is the inclusion of indices of economic development when the research effort was focused primarily on economic growth. But the present researcher has considered it relevant to the present study due to the new insight it has created.

Adeniyi and Abiodun (2011) carried out a study on health expenditure and Nigerian economic growth. The study covered the period, 1985 to 2009. Results from the OLS techniques revealed a negative effect of total health expenditure on economic growth in Nigeria. Variables included in the analysis are real GDP as measures for economic growth, while capital expenditure on health, recurrent expenditure on health, total expenditure on health, life expectancy and fertility rate as independent variables. The study recommended that health provision and improvement should be a priority goal of any government as well as a central input

into economic development and poverty reduction. However, the study further revealed that country-specific growth diagnostic suggests that total health expenditure can be a key constraint to growth. The study has its drawback in the inclusion of total health expenditure after it has accommodated capital and recurrent expenditures on health. Besides, the policy recommendation for enhancing economic development falls outside the focus of the study. Despite these flaws, the present research has found it relevant in their choice of variables and techniques of analysis.

Odubunmi, Saka, and Oke (2012) carried out a study on "Testing the co-integration relationship between health care expenditure and economic growth in Nigeria'. The study covered the period, 1970-2009. They used multivariate co-integration techniques for analysis of data. The study revealed the existent of at least one co-integrating vector describing a long-run relationship among real GDP, foreign aids, health expenditure, total saving and population. The weakness of the study is the omission of health outcomes in the study considering its importance in promoting economic growth. Also, the study ignored the potential for reverse causation and endogeneity in the health-growth relationship which has resulted in specification bias. However, the study is considered relevant as it has contributed useful variables included in the present study.

Babatunde (2012) carried out a study on the relationship between health and economic growth in Nigeria. The study covered the period, 1970-2008. The study employed and modelled income and health within a simultaneous equation using 3SLS, a system method, to allow for the expected bi-directional causation amongst the variables. The study utilized two equations: economic growth (GDP) and health. The study revealed that life expectancy and school enrolment has a positive and significant effect on economic growth. Also, there was negative significant effect of death rate on economic growth. The strength of this study derives from its inclusion of relevant vital statistics in the analysis. The present study has adopted some of these variables for inclusion in its analysis.

Boyacioğlu (2012) examined the relationship between health expenditures and sustainable development. Per capita GDP used as proxy for sustainable development is the dependent variable while health indicators-infant mortality rate and life expectancy were used as independent variables. Turkey's health expenditures and other development indicators related to the research were compared with those of advanced countries. A benchmark and due diligence was done within the countries and Turkey on sustainable development. The study revealed that health expenditure has positive significant effect on economic development. The study has its strength on the analytical framework which supported a comparative study between Turkey and selected advanced countries.

Nasiru and Usman (2012) examined the dynamic relationship between health expenditure and economic growth in Nigeria. The study covered the period, 1980-2010. The study employed ARDL bound test and Granger causality test for analysis of data. The findings of the study indicate that (i) There is a long-run relationship between health expenditure and economic growth; (2) There is a unidirectional relationship between health expenditure and economic growth. Policy implication of findings is the need for federal and state governments to consider investment in health sector as an important macroeconomic policy instrument. The dynamic approach adopted for this study is its strength. The study has been found useful for accodating the findings of the present study.

Elmi and Sadeghi (2012) investigated the causality and co-integration relationships between health care expenditures and economic growth in developing countries. The study covered the period, 1990-2009. This study adopted panel co-integration, granger causality and VECM framework. The findings revealed that there is a short-run causality from GDP to health care spending, while it did not observe any short-run causality from health spending to economic growth. A directional causality and long-run relationship existed between economic growth and health spending. The implication of the findings is that income is an important factor across developing countries in determining the rate of growth of health care expenditure in the long-run. This has confirmed the health-led growth hypothesis in developing countries. The findings of the study have been found useful for integrating the present study into the existing economic literature. It has its strength in its choice of strong analytical framework.

Sirag, Adamu and Nor (2013) examined the long and short run relationship between healthcare and economic growth in Sudan covering a period from 1980-2010. Health care is represented by life expectancy and economic growth by GDP per capita. Applying ARDL model, the results provided strong evidence that health care is positively related to economic growth in the long and short runs. The granger causality test result revealed a unidirectional relationship running from healthcare to economic growth. Policy implication of findings is the need to allocate adequate fund to health sectors in order to achieve sustainable economic growth. The major drawback of the study is the use of GDP per capita as proxy for economic growth. However, the study has relevance in providing standards for comparing the results of the present study.

Onisanwa (2014) examined the impact of health on economic growth in Nigeria. Study spanned across 1995-2009. Quarterly time series data were used for the study. Data were analysed using co-integration and granger causality techniques. The study revealed that GDP is positively influenced by health indicators in the long-run and health indicators caused the per capita GDP. The policy implication of the findings is the need to enhance the health status of citizens in order to foster growth in a country. The strength of the study lies in its choice of suitable techniques of analysis. The study is relevant to the present study as it has provided a further guide in the conduct and advancement of the study.

Oni (2014) studied the impact of health expenditure on economic growth in Nigeria. The study covered the period, 1970-2010. Study employed multiple regression technique for analysis of data. Result indicate that gross capital formation, total health expenditure, and labour force productivity proxied by secondary school enrolment are important determinant of economic growth while life expectancy has negative impact on growth in Nigeria. The inclusion of non-associative variables like gross capital formation constitutes a drawback which cannot be ignored. However, it is considered relevant for the purpose of comparison with the results of the present study.

Rhee (2014) explores the impact of healthcare expenditure on national income for world economies grouped by income levels. Study used rational expectation for forecasting procedures. Empirical evidence reveals that private, public, and total healthcare expenditure positively affects national incomes in most cases. The study has its weakness in the use of rational expectation which is not strong enough for an indepth analysis of data that could yield reliable forecast. Nevertheless, the study has given direction in the conduct of the present study.

Ibe and Olulu-Briggs (2015) investigated the impact of public health expenditure on economic growth in Nigeria. The study covered the period, 1981-2013. Study employed OLS multiple regression analysis, equation estimation, Johansen multivariate co-integration and granger causality analytical techniques to analyse the data. Results indicate that: (1) Positive significant long-run relationship exists between public health expenditure and economic growth. (2) There was a unidirectional causality between GDP and all public health expenditure variables including gross capital formation, total education expenditure and total health expenditure. Policy implication is the need for Nigeria policy makers to increase budgetary allocation to health sector in order to foster growth. The inclusion of non-associative variable like total education expenditure in the model is itself a weakness. But the findings of the study would support the present research effort.

Bedir (2016) examined the relationship between healthcare expenditure and economic growth in developing countries. Study covered the period, 1995-2013. Study employed OLS, fully modifies ordinary least square (FMOLS) and dynamic OLS (DOLS) as well as the modified version of granger causality test. Per capita GDP was used as proxy for economic growth and per capita health expenditure was used as an indicator of healthcare expenditure. Results indicate that: (1) Health expenditure has a positive and significant effect on economic growth for all countries. (2) Directional causality exists between the Czech Republic and the Russian Federation. (3) Directional relationship provides leverage for income, in the sense that economic growth increases per capita in India, Nigeria and Africa to a large extent. The use of modified granger causality is novel. The results of the study are insightful.

Udeorah, Obayori and Onuchukwu (2018) studied the impact of health care expenditure on economic growth in Nigeria. Study covered the period, 1980-2016. The study used descriptive statistics and Generalized Method of Moments (GMM) test for data analysis. Findings indicate that: (1) Healthcare expenditure had

no significant impact on economic growth. (2) Education expenditure had positive significant impact on economic growth. Policy implication of findings is the need for government to embark on m,assive health education of citizens to foster economic growth. Its analytical framework is robust. It has relevance as a guide in the conduct and advancement of the present study.

Anowor, Ichoku, Onodugo and McMillan (2020) carried out a study on "Nexus between healthcare financing and economic performance proxied by output per capita: Analysis of countries in 15 member countries of ECOWAS sub-region. Data spanned the period 1985-2017. Panel autoregressive distributed lag (PARDL) technique was used for the analysis of data. The results indicate that both private and public expenditures had significant positive effect on economic performance, and that there was a long-run relationship between health-care spending and output per capita in the ECOWAS region. Policy implication is the need for government at all levels to involve private healthcare institutions in health policy formulation and implementation for a proper co-ordination of activities of health professionals. The study has its strength in its use of panel data and a strong analytical framework thar supported the extensives estimation of variables included in the model. It has relevance to the present study in the sense that its findings were found useful for the purpose of comparison.

Olayiwola and Olusanya (2021) investigated the impact of Health financing and economic growth in Nigeria. Study covered the period, 1990-2020. Granger causality test and ARDL estimation techniques were used to analyse the time series data. The results indicate that: (1) Current domestic government general health expenditure has negative significant effect on economic growth while the previous year domestic general government health expenditure had positive significant effect on economic growth. (2) Current of-of-pocket health expenditure had negative significant effect on economic growth while the previous year out-of-pocket health expenditure had positive significant effect on economic growth. Policy implication of findings is the need for government at all levels to augment individual health spending ability via wide coverage of National Health Insurance Schemes. A serious omission of the study is that the granger causality techniques employed was never used for the analysis of data. However, the study was considered relevant as its findings would be useful for accommodating own findings

Olayiwola, Bakare-Aremu and Abiodun (2021), in their study, re-examined the connection between public health expenditure and economic growth in Nigeria within the context of Wagner's Theory. The study covered the period, 2000-2016. They employed granger causality test for analysis of data. Results indicate that: (1) There was long-run relationship between public health expenditure and economic growth. (2) There was a uni-directional causal relationship between health expenditure and economic growth. (3) There was no causal relationship between public health expenditure and economic growth. They concluded that there was no causal relationship growth of public health expenditure and economic growth in Nigeria. Wagner's law of increasing state activities is not valid for making a strong statement on the relationship between public health expenditure and economic growth. Despite the weakness, the results of the study have provided insight into the possible outcomes of the present study.

Sirag and Nor (2021) investigated the effect of out-of-pocket health expenditure on poverty in a sample of 145 countries using macroeconomic data that spanned the period from 2000 to 2017. A dynamic threshold panel method which allowed for the endogeneity of the threshold regressor (OOPHE) was applied. Three poverty indicators were adopted namely, the poverty gap index, poverty headcount ratio, and poverty gap squared index. Result indicates that in four out of six regions, the effects of out-of-pocket health spending on poverty were contingent on certain threshold levels. The study has policy implication that there is an urgent need for fast structural reforms of health care systems, especially in the post COVID-19 era and also the need for reduction in excessive out-of-pocket health expenditure. The strength of the study derives from the panel data from 145 countries. The findings of the study are suitable reference materials that guided the conduct and advancement of the present study.

### 2.4. Gaps in Literature and Contribution to Knowledge

The global emphasis on sustainable economic development, as well as the resurgence of interest among researchers in comprehending the effect of public and household health expenditure on economic development in developing countries, especially Nigeria, highlights a significant concern. Regrettably, there

is a dearth of empirical literature on the public/household health expenditures-economic development nexus in developing countries, especially Nigeria. Besides, the findings of a few studies on public/household health expenditures-economic development nexus are conflicting. It is this which has necessitated that the present study be embarked upon which could possibly yield results that would serve to mediate between the discordant sets of findings. However, it is possible that differences in findings of previous related studies may stem from their choice of variables and the ordering of variables in the model as well as the techniques for data analysis. Therefore, the use of a composite economic development index adopted from Dudley Seers Three-Pillar model of development (Poverty, Inequality and unemployment) is a clear departure from the approach adopted by the earlier studies and certainly represented a novel method.

2.5. **Stylized Facts on Health Expenditure in Nigeria**
1)   **Profile of Health Expenditures in Nigeria.**
Figure 2.2: Rising Recurrent, Oscillating Capital and Total Budget Allocation to Health Sector

Rising Recurrent, Oscillating capital and Total Budget allocation to Health sector

Legend:
- CAPITAL EXPENDITURE(₦' Bn)
- RECURRENT EXPENDITURE (₦'Bn)
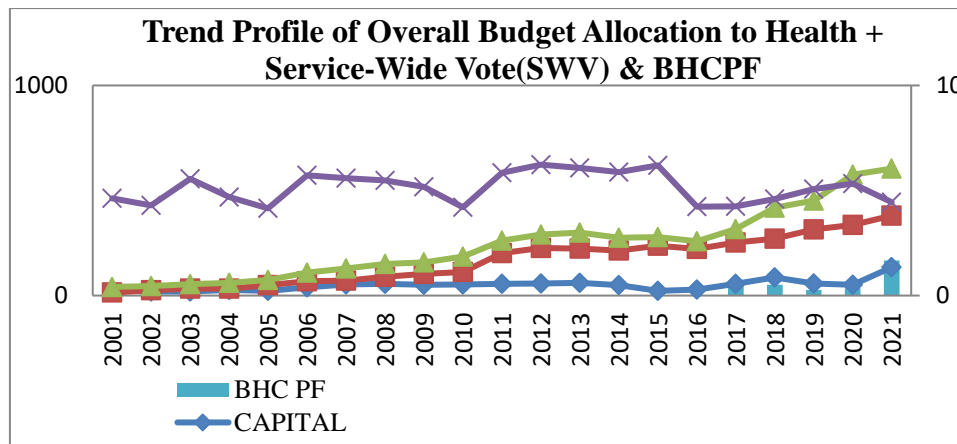- TOTAL HEALTH BUDGET (₦' Bn)
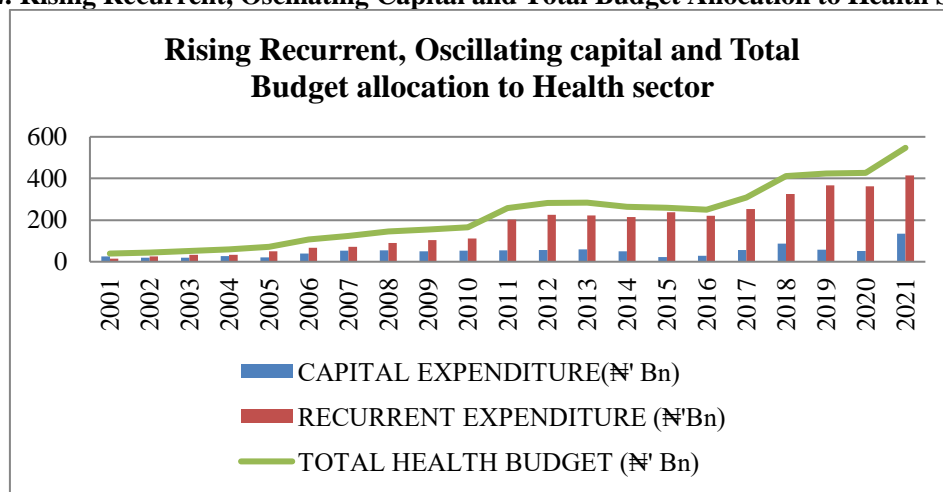
Source: Federal Ministry of Health, 2021.

Note: Basic Health Care Provision Fund (BHCPF) is included in Recurrent Expenditure from 2018-2021.
Figure 2.2 shows the rising recurrent and oscillating capital expenditure in the health sector together with the total health budget in Nigeria. The allocation to recurrent expenditure in the 2021 budget was N415.24 billion compared to N363.05 billion in the 2020 revised budget, indicating an increase of 14.4%. The health capital expenditure increased at a very slow rate from N51.4 billion in the 2020 revised budget to N134.59 billion in the 2021 budget, an increase of 156% out of the total health budget of N427.3 billion in 2020 and 547.24 in 2021 respectively. The trend analysis shows that as total expenditure allocated to health keeps on increasing, the recurrent expenditure increases while capital on the other hand fluctuates. This indicates that government has a very low interest in investing and spending in capital health project.

Figure 2.3
Trend Profile of the Overall Budget Allocation to Health Plus Service –Wide Vote and Basic Health Care Provision Fund (BHCPF)

Source: Federal Ministry of Health, 2021; Ministry of Finance, Budget and National Planning, 2021, PACFaH@Scale

Note: In Recurrent Health Expenditure Trend, BHCPF was excluded from 2018-2021.

Overall budget health allocation trends– recurrent, capital and total health budget inclusive of service-wide vote and then the BHCPF from 2001 to 2021 in billions of Naira.

Figure 2.3 shows the various percentage of budgetary allocation to health sector to the budget size, taking into consideration all other funding under the service-wide votes (SWV) meant for health sector and also Basic Health Care Provision Fund (BHCPF). The SWV are contingency budget – is an amount of money that is included to cover potential events that are not specifically accounted for in a cost estimate. It is fund set aside to cover unexpected costs or expenses. SWV comprises of counterpart funds, Gavi/Immunization, Zonal Intervention project (ZIP), COVID-19 Intervention Fund and others. Despite all these accrued alternative funding under the SWV and the BHCPF, the highest budgetary allocation to the health sector was 6.23% in the year 2012. However, the average allocation to the sector given the entire alternative funding in the 20years is 5.05% which is far below the 15% Abuja Declaration commitment. Thus, it also represents 9.95% shortfall. Therefore, in 2021 fiscal year, the overall health budget to budget size is 4.45% to budget size as seen in the graph above. This is far below expectation regarding Federal government budgetary allocation to health sector. It could be observed from the figure 2.3 that the capital health expenditure allocation has been low over the 20 years compared to the recurrent expenditure which has been on the increased. This indicates where government priority lays, its significant attention to the recurrent health expenditure.

On the budget item for BHCPF is another clear indication of the Nigeria government low commitment to the healthcare of its citizens. The funds allocated for BHCPF does not reflect the expected one per cent stipulated in the National Health Act (NHAct) of 2014. The NHAct 2014 states that "at least one per cent of the Consolidated Revenue Fund (CRF) shall be allocated to the BHCPF". The absolute size of the 1% consolidated revenue fund (CRF) being allocated to BHCPF is on the downward trend since 2018 when it was first implemented after it was enacted into law in 2014 by Goodluck Jonathan administration from N55.15 billion in 2018 to N35.03 billion in 2021. It dropped by -13.12 per cent (N51.22 billion in 2019 to N26.46 billion in 2020 and then a marginal increase of N35.03 in 2021).

It is worth noting that the BHCPF trend is not included in the recurrent health expenditure rather it was specified separately to identify the trend properly as an additional fund to the health sector. This BHCPF is a government program enshrine in the National Health Act of 2014 which called for better investment within the Health Sector. It is a Federal and state funded initiative, an irrevocable testament of the national commitment to achieving universal health coverage (UHC). BHCPF was established to increase the overall financing to the health sector, provide minimum basic healthcare and essential services and to help improve access to primary health care services for all Nigerians especially the poor and the most vulnerable Nigerian

population, so as to reduce out-of-pocket expenses and this is done through accredited Primary Health Centres (PHC) in each of the 36 states and federal capital territory. It is designed to be a sustainable model for ensuring equity and financial risk for vulnerable population, by guaranteeing access to a basic minimum package of health service. It is funded from "not less than one per cent" of the federal consolidated revenue fund (CRF), supplemented by grants from local and international donors, partners, the private sector and philanthropic organizations (FMoH, 2020, Makanjuola & Van vuuren, 2021).

Unfortunately, the BHCPF trend shows that it has been on a downward progression since President Muhammadu Buhari approved the operationalization in 2018 budget with an allocation of N55.15billion. In 2019, N51.22 billion was allocated and then in 2020 fiscal year budget, the sum of N44.498 was earmarked but revised to N26.457billion, a decrease of more than 42.5%, due to shortfall in revenue occasioned by COVID-19 and oil price volatility which results from changes in oil price towards its mean value. It created a demand shock as COVID-19 reduced global demand for crude oil, increase uncertainty, and triggered a serious economic recession in most developed and emerging countries and also it led to a supply shock as the pandemic resulted in an oil trade war between the major oil-producing countries- Saudi Arabia and Russia, both shocks led to very high levels of oil price volatility in the country (Bourghelle, Jawadi, & Rozin, 2021). This resulted in the reversal of BHCPF allocation to health in 2020 from N44.498 to N26.457billon. Thus, this does not reflect the expected 1% stipulated in the NHAct of 2014. Then, in 2021, N35.026 billion was allocated for BHCPF as can be seen in the trend profile. This is also a proof that this administration shows less concern to prioritizing health which is the bedrock for the attainment of a sustainable economic growth and development.

It should be noted that, based on the 2020 budget, the CRF is N10.33 trillion, which means that the 1% allocation to BHCPF should be 103.3 billion and not N44.50 billion. It is unclear how the allocation to BHCPF is derived. This has not reflected in the actual funds allocated to BHCPF, though the CRF has been on the increase which forms the basis for allocating funds to BHCPF. Unfortunately, millions of Nigerians are yet to feel the impact, they have not benefitted from the fund, given several challenges and delays in its implementation.

Figure 2.4a: Health Capital Budget Allocation, Released and utilized Fund in Percentages
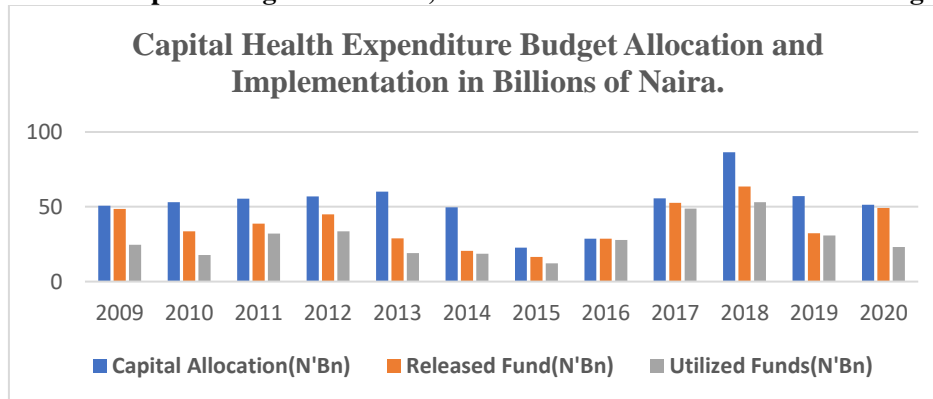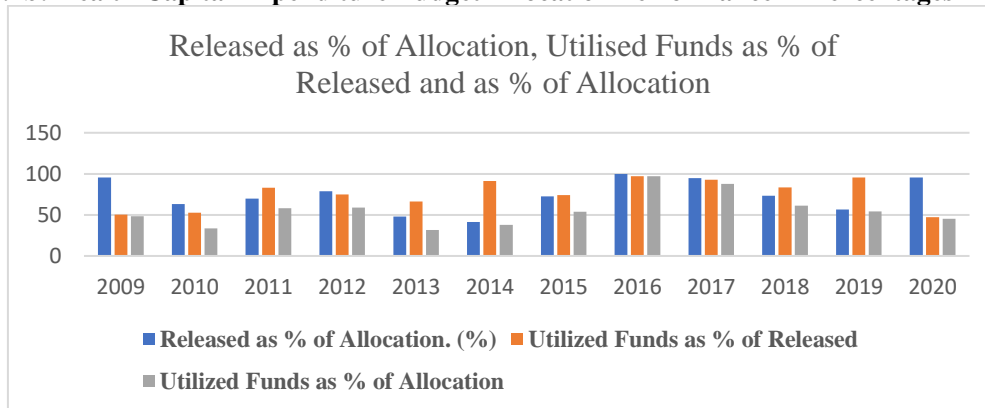

Source: FMoH; National budget and Planning 2020, 2021

Figure 2.4a illustrates the capital budget allocation to health, amount released from the total amount allocated and the amount of funds utilized out of the capital allocated and released within the period 2009-2020. In 2009, it can be seen from the graph Fig 2.4a that N50.8bn was allocated to health, and out of that amount, N48.64bn was released for capital project while the sum of N25bn was utilized out of the sum of N48.64bn released to carry out capital health project and N24.13bn was returned to the treasury. Thus, in 2016, there is no disparity from the capital amount allocated, released and utilized. The sum of N28.65bn was allocated, N28.59bn was released and N28bn was utilized. In 2013 and 2018 respectively, it shows that N60.08bn and 86.49bn was allocated and N28.84bn and N63.49bn was released for health project respectively while only a meager sum of 19.11bn and 52.99bn was utilized respectively. However, between 2009 and 2020, the total

of N627.77bn was allocated as capital health expenditure, out of which the total of N457.90 was released while a total of N 341.84 was utilized and a total of N90.15bn was returned to the treasury. If fully utilized would have gone a long way to improving the health status of the populace in Nigeria. Thus, this underutilization, under spending and uunderfunding in the nation's health system restricts opportunities for achieving equitable, high-quality, and universally accessible healthcare. This implies another indication of government low commitment to the healthcare of its citizens.

Figure 2.4b: Health Capital Expenditure Budget Allocation Performance in Percentages

Source: FMoH 2020, National budget and Planning 2020

Figure 2.4b shows the capital health expenditure performance in percentages. It reveals that the amount released for the period 2009 to 2020 represents 72.94% of the total cumulative allocation. The total utilized funds as percentage (%) of released constitutes 74.65% while a total of 54.45% was utilized as percentage of total allocation to capital health expenditure budget. Also, as shown in the graph Fig 2.4b, the capital budget has been implemented at best to 97.26% (amount best utilized) which was in 2016. The budget has not been done utilized beyond 97.26% in 2016. And a total of N783bn which was very small compared to other years was returned to the treasury for the year 2016 (see Appendix 2). Consequently, to effectively tackle the challenges within the healthcare sector and enhance health outcomes for Nigerians, it is imperative to make prudent budgetary decisions and allocate sufficient funds towards health spending. The on-going issue of inadequate commitment to budget allocation and consistent under spending, alongside the burden of high out-of-pocket expenses, exacerbates the difficulties encountered by Nigerians in meeting their healthcare requirements, thus hindering the realization of sustainable economic development.

3. Methodology
3.1. Theoretical Framework
The analytical framework that supported the effect of public/household health expenditures on economic development was built around Wagner's law of increasing state activities. According to Wagner, there are inherent tendencies from the activities of the government to increase both extensively and intensively. In other words, as an economy develops overtime, the activities or functions of the government also increase. Thus, there is a functional relationship between the growth of an economy and government expenditure. This implies that the expansion in general functions and activities leads to the increase in public expenditure which in turn leads to the growth of the economy (Bhatia 2001; Musgrave & Musgrave, 2011; Ahuja 2012, Agiobenebo, 2019). This theory establishes causality from economic growth to public spending and is a long-run analysis. Wagner designed three focal bases for the increased in state expenditure. First, during industrialization process, public sector activities will replace private sector activity. Second, governments need to provide cultural and welfare services such as education, public health, etc. third, increased industrialization would foster technological change and lead to emergence of large firms with monopoly powers.

According to Magazzino, Giolli and Mele (2015), Wagner's law posits that in the course of economic development, the share of the public sector in GDP increases overtime. Consequently, in the initial stage of economic growth, the state feels the need to expand its activities in several fields quickly. However, as the initial deficiency is removed, the increase in state activities is likely to slow down. The factors, relate to a growing role of the state in ever-increasing socio-economic complexities of modern society.

3.2. Model Specification

Generally, the essence of economic modeling in research such as this study is to represent a particular economic phenomenon under investigation in such a way as to enable the researcher attribute numerical values to the concept (Durosinmi, 2012). In line with the theoretical framework stated above, this study has adopted and modified the works of Boachie, Ramu and Põlajeva (2018) and that of Dhrifi (2018) combined. The model examined the effect of public health expenditure on economic development in Nigeria. This model follows the work by Dhrifi (2018) and Nzima, (2014) with minor variable modifications to address the first objective of the study. The model is specified in a functional form as:

PIU= f (HS, PHExp, RGDPpc, LR, W/ELECT, PHY, Pov, LEXP, Upop, QoG, PvHE)… (1)

Where the dependent variable is represented by PIU a combination of poverty, inequality and unemployment representing composite economic development index; while the core explanatory variables include PHExp is public health expenditure, RGDPpc is real gross domestic product per capita, LR is literacy rate, W/ELECT is water/sanitation and electricity, PHY is physician density, Pov is poverty rate, LEXP is life expectancy at birth, Upop is urban population, QoG is quality of governance and PvHE is private health expenditure.

The functional form of the regression equation (1) is transformed into a mathematical statistical form of the model as thus;

$$PIU_t = \beta o + \beta_1 HS_t + \beta_2 PHExp_t + \beta_3 RGDPpc_t + \beta_4 LR_t + \beta_5 W/ELECT_t + \beta_6 PHY_t + \beta_7 Pov_t + \beta_8 LEXP_t + \beta_9 Upop_t + \beta_{10} QoG_t + \beta_{11} PvHE_t…. \quad (2)$$

Econometrically, the model is specified by adding the stochastic variables as thus:

$$PIU_t = \beta o + \beta_1 HS_t + \beta_2 PHExp_t + \beta_3 RGDPpc_t + \beta_4 LR_t + \beta_5 W/ELECT_t + \beta_6 PHY_t + \beta_7 Pov_t + \beta_8 LEXP_t + \beta_9 Upop_t + \beta_{10} QoG_t + \beta_{11} PvHE_t + \mu i \quad (3)$$

The natural rate of change of equation (3) is modeled as:

$$logPIU_t = \beta o + \beta_1 logHS_t + \beta_2 logPHExp_t + \beta_3 logRGDPpc_t + \beta_4 logLR_t + \beta_5 logW/ELECT_t + \beta_6 logPHY_t + \beta_7 logPov_t + \beta_8 logLEXP_t + \beta_9 logUpop_t + \beta_{10} logQoG_t + \beta_{11} logPvHE_t + \mu i \quad (4)$$

Where βo is the intercept, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6......+\beta_{11}$ are the coefficients, the parameters of the explanatory variables while μi is the error term. PIU_t, HS_t, $PHExp_t$, $RGDPpc_t$, LR_t, $W/ELECT_t$, PHY_t, Pov_t, $LEXP_t$, $Upop_t$, QoG_t, and $PvHE_t$ are as previously defined while subscript t is the time period and logs denote the natural logarithm which allows for the interpretation of coefficients as elasticities and help in dealing with data that exhibit heteroscedasticity. So, taking the logarithm can stabilize the variance, making it more homoscedastic.

Table 3.1

A priori Expectations of Explanatory Variables for Model I

Dependent Variable is PIU

Independent Variables	Expected Signs
HS	Negative -
PHExp	Negative -
RGDPpc	Negative -
LR	Negative -
W/ELECT	Negative -
PHY	Negative -
Pov	Positive +
LEXP	Negative -
Upop	Positive +
QoG	Negative -
PvHE	Negative -

Source: Researcher's Compilation, 2023.

3.3. Estimation Procedure

The research adopts the 3SLS estimation procedure for the analysis because using OLS is inconsistent and inefficient for this purpose. The technique was adopted to address the endogeneity bias among the study's three major variables, namely; public and household health expenditure, health status and economic development. The 3SLS is a system method that is applied to all equations of the model at the same time and gives estimates of all the parameters simultaneously. This method according to Koutsoyiannis (1977) was developed by Theil and Zellner (1962) as an extension of Theil's (1958) two stage least square. In this three stage approach, it involves the method of Least Square (LS) in three successive stages, hence the name three-stage. Furthermore, it equally utilizes more information than the single-equation techniques such as regression, Instrumental Variables (IV) and Two Stage-Least Squares (2SLS) techniques; hence it takes into account the entire structure of the model with all the values of the parameters.

The following are the procedures for using the 3SLS simultaneous equation estimation method/technique;

(i)   In the first stage, the study applies least square to the reduced form equation in order to obtain an estimate of the exact and the random components of the endogenous variables;

$Yi = \hat{Y}i + Vi$

Where:

$\hat{Y} = \pi_{X1} + \pi_{i2}X_2 + \ldots + \pi_i K_K K$

(ii)   In the second stage, we replaces all endogenous variables appearing in the right hand side of the equation with their estimated value, i.e., $Yi = \hat{Y} + Vi$ and thus apply OLS to the transformed original equation to obtain estimates of the structural parameters.

(iii)   The third stage is the application of Generalized Least Square (GLS) to the set of transformed equations in which the transformation required is obtained from the reduced-form residuals of the previous stage.

It is important to note here that the 3SLS is a straightforward extension of TSLS and involves the application of least squares in three stages. The first two stages are the same as TSLS except that we deal with the reduced-form of all the equations of the system simultaneously (Koutsoyiannis, 1977).

Simultaneous equation models are normally used when the endogenous variable in one equation becomes an exogenous variable in another. Estimation methods that can be used in the context of simultaneous equation models depend on identification criteria for estimating the model and the endogeneity problem. In the present case, it has already been stated that the model is over-identified, so using OLS to estimate the structural equations will result in inconsistent estimates for the model parameters. The model therefore has an endogeneity problem of order two, which is why estimation by OLS would be double-registered. This estimation method is used on the Three Stage Least Square (3SLS) techniques, which aims to solve endogeneity problems by introducing the problematic variables as instrumental variables.

3.4. Description and Measurement of the Variables of the Model

The variables used in the model specification are consistent with the empirical literature reviewed which also makes it possible to identify the pathways through which public health expenditure and other covariate factors other than health status indicators can affect or improve the health status of the population in particular in order to attain economic development in Nigeria. The variables are hereby described and measured as follows;

(1)   Economic Development Index: The economic development index is a composite index that assesses economic development in Nigeria for this study and is represented by PIU which is a combination of three (3) dimensions: Poverty, Inequality and Unemployment (PIU) as defined by Dudley Seers, 1969, known as Seers' Three-Pillar Model of Development. The economic development index was constructed and developed to serve as a tool to gauge the social and economic development of societies, especially the developing countries. It takes into account indicators such as poverty rate, inequality and unemployment. If a society shows progress in these indicators inclusive of the growth rate, it is considered to have achieved some level of social and economic development. However, this is achieved using a principal component analysis (PCA). Furthermore, by employing principal component analysis (PCA) as a methodological framework, we can effectively synthesize multiple indicators into composite indexes that capture the multidimensional nature of development. PCA allows us to identify underlying patterns and relationships among variables, enabling a more comprehensive assessment that goes beyond simple aggregations of individual metrics. PCA allows us to effectively combine multiple indicators into a smaller set of components while retaining as much of the original information as possible. This not only simplifies the analysis but also helps identify underlying patterns and relationships within the data. In this study, the composite index for economic development was computed in a way that decrease in the index indicates improvement in economic development (decrease in poverty rate, unemployment and income inequality) while increase in the index signifies deterioration of economic development (increase in poverty rate, unemployment and income inequality).

(2)   Public Health Expenditure (PHExp): proxied by domestic general government health expenditure per capita. It is a financial resources allocated by the government or public authorities to support and fund healthcare services and initiatives aimed at improving the health and well-being of the population.

(3)   Urban Population (Upop): It refers to the number of people living in urban areas, which is characterised by densely populated and developed areas such as cities and towns. This variable represents the demographic factors used in this study. Proxied by total percentage of population.

(4)   Health Infrastructure: proxied by electricity. Health infrastructures are considered to be critical infrastructures in many countries. Critical infrastructures are understood as facilities and services vital to the basic operations of a society. In other to function properly, societies depend on these infrastructures to work. A functioning health infrastructure depends on other infrastructures. Hospitals and other healthcare facilities depend critically on power supply, among others. Hence the choice of electricity as proxy for health infrastructure. Without power, for example, ventilators on which lives depends, cannot continue to operate, and digital patient files can no longer be viewed. This is why most countries in developed areas such as Germany, have legal regulations for emergency power supply in hospital, so that most essential areas, such as intensive care units, can continue to function for a certain period of time even during blackout. But even here in most developing countries there are gaps as there are no such regulations (United Nation University-Environment and Human Security [UNU-EHS], 2020). A developed health infrastructure also guarantees a country of strong and healthy manpower for the production of goods and services.

(5)   Quality of Governance (QoG): the quality of governance refers to the effectiveness, transparency, accountability, and fairness of a government's actions and policies. It is essential for the well-being and development of a society as it can lead to economic, social and political stability. Assessing the quality of governance often involves evaluating indicators such as the control of corruption, rule of law, political stability, regulatory quality, government effectiveness and voice and accountability. Given its intrinsic value and positive association with the level of development, good governance

should be pursued in all dimensions as a basic development goal and could be used as potential entry point of development strategies for many countries (Zhuang, Dios, & Lagman-Martin, 2010).

(6) Private Health Expenditure (PvHE): refers to the total spending on health care goods and services by private entities, such as individuals, households, and non-governmental organizations, excluding government expenditures. It encompasses various direct household (out-of-pocket) payment, private insurance premiums, charitable donations, direct payments for health services and products, and direct service payment by private corporations (FMoH, 2020).

4. Results and Discussion

This section deals with data presentation, analysis and discussion of the results. The results of data analysis have been presented in tables for verifying the hypotheses formulated for the study.

4.1. Summary of Descriptive Statistics

In order to gain insight into the nature and characteristics of the data, the descriptive statistics have been presented in Table 4.1

Table 4.1

Descriptive Statistics of Variables

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Obs.
HS	694.903	750.708	774.505	543.412	88.199	-0.510	1.511	40
PHEXP	108.690	20.581	1477.700	0.041	244.253	4.595	26.037	40
PHY	0.255	0.192	0.449	0.050	0.099	0.434	2.112	40
PIU	59.724	60.023	74.509	49.589	7.721	0.147	1.851	40
POV	52.226	54.836	64.900	38.033	8.270	-0.384	1.785	40
PvHE	52.850	65.556	80.138	23.848	23.012	-0.083	1.102	40
QOG	16.013	16.000	28.000	4.000	8.177	0.117	1.395	40
RGDPpc	1874.181	1671.740	2688.267	1388.535	468.832	0.510	1.618	40
LR	46.389	43.882	64.254	41.387	4.893	1.806	6.003	40
UPOP	36.581	35.255	51.958	22.671	8.631	0.183	1.878	40
W/ELECT	104.412	76.104	310.415	37.602	59.528	1.661	5.540	40
LEXP	48.445	46.388	55.018	45.637	3.171	0.835	2.141	40

Source: Author's Computation using E-views 12

Table 4.1 shows that PHY had Mean=0.255 which indicates that one doctor is available to more than 1000 persons. With respect to PHExp and PvHE, the table shows that PHEXP had Mean=108.690 (Standard deviation=244.253) while PvHE had Mean=52.850 (Standard deviation=23.012). This implies that public health expenditure on health stood at ₦108.69 billion within the period under consideration while private health expenditure stood at ₦52.85 billion in the same period. Life expectancy at birth averaged 48 years with a standard deviation of 3.17 years. This means that a newborn in Nigeria is expected to live for about 48 years on average and a possible maximum of 55 years. GDP per capita income level averaged US$1,874 while poverty headcount rate averaged 52 percent. On average, urban population is approximately 37 percent of the total population implying the present of a large rural population in the country. Literacy rate is also quite low on average as only 46 percent of the population from 15 years above on average can read and write.

4.2. Model Estimation Results

Table 4.2

3SLS Results for Economic Development index (PIU)

	PIU Equation		
	Coefficient	Std. Error	Prob.
Constant	3.665	2.777	0.018
PIU	--	--	--
PHEXP	0.009	0.009	0.284
HS	**0.688*****	0.216	0.002
RGDPC	**-0.221*****	0.058	0.000
LR	0.031	0.030	0.303
W/ELECT	0.016**	0.007	0.037
PHY	0.009	0.009	0.119
POV	--	--	--
LEXP	**-0.899****	0.338	0.009
UPOP	**0.369****	0.144	0.012
PVHE	**-0.096*****	0.014	0.000
QOG	-0.015	0.009	0.108
Obs	38		
R-squared	0.987		
Adj. R-squared	0.982		
Durbin-Watson	1.653		

*Note: ***, **, and * denote significance level for 1%, 5% and 10% respectively. Embolden are variables with statistical significance. All variables are expressed on their natural logarithmic transformation.*
Source: Author's Computation using E-views 12

The economic development (PIU) equation presented in Table 4.5 extracted from the system of simultaneous equation shows that the impact of public health expenditure on the composite economic development index is positive though not statistically significant. This means that public health expenditure may not be a strong determinant of economic development through lowering inequality and poverty as well as unemployment (PIU). This result clearly describes the Nigerian situation where budgetary allocations for public health expenditure are significantly small and insufficient to facilitate effective and efficient public health service delivery. Other variables which are relatively non-significant in the economic development equation include literacy rate, physician density and corruption level. On the other hand, the impact of composite health status is positive with an elasticity of 0.688 and significant at the 1 percent level. This means that a 1 percent increase in the health status variable which signifies deteriorating health conditions lead to 0.688 percentage point deterioration in the development outcomes. Put differently, an improvement in health status is associated with better development outcomes which enhance productivity due to healthy living and access to quality healthcare services. Similarly, income level has a negative effect with an elasticity of -0.221 and statistical significance at the 1 percent level. Thus, a 1 percent increase in the income level reduces the composite economic development variable by -0.22 percentage points. This means that higher income will result in better development outcomes as it will reduce the inequality and poverty gaps and by implication unemployment as more people become employed due to an expansion in economic activities. This is in line with the findings by Eneji, Dickson and Onabe (2013); Deluna and Peralta (2014).

The impact of water and electricity infrastructure on composite economic development index is positive with an elasticity of 0.016 and statistical significance at the 5 percent level. The significance of this variable underscores the important of water accessibility and adequate and stable power supply for rapid economic

development. Both variables are indispensable in all facets of human activities, and so, contribute to sustainable development. Further, the impact of life expectancy on the composite economic development index is negative with a coefficient of -0.899 and statistical significance at the 5 percent level. Higher life expectancy can contribute to economic development through a larger proportion of active labour which can be harnessed to boost productivity growth. In the same vein, private healthcare expenditure also leads to better development outcomes. An increase in private healthcare expenditure by 1 percent leads to -0.096 percentage point reduction in the composite development measure which signifies better development outcomes. Meanwhile, the effect of urban population is positive with a coefficient elasticity of 0.369 and statistical significance at 5 percent level. In other words, a 1 percent increase in urbanization rate is associated with 0.369 percentage point deterioration in economic development. This can be explained by the fact that greater urbanization without corresponding surge in job opportunities and employment or adequate infrastructural provisions can lead to poor living conditions, urban sprawl, negative externalities, which ultimately would tend to worsen or retard sustainable development. Similar findings can be seen in Olabisi, (2016), Edeme and Olisakwe, (2019).

In summary, the above results in Table 4.2 clearly provide evidence that the direct impact of public health expenditure on economic development is non-significant whereas household health expenditure is associated with better development outcomes, as indicated by a negative coefficient. An increase in household spending is linked to a reduction in the composite development measure, suggesting improved development outcomes.

4.3. Discussion of Findings

This study is an analysis of the effect of public and household health expenditures on economic development in Nigeria. The primary objective of this study is to elucidate the effect of public and household health expenditures on composite economic development index, a combination of Seers Three-Pillar Model of development namely poverty, inequality and unemployment (PIU) considering the complementarity of health status of the population on development in Nigeria.

One important finding of the study is that economic development in Nigeria is enhanced mainly by private (out-of-pocket) health expenditure. This is indicated by the negative and significant coefficient of private health expenditure variable which indicates that increase in private health spending helps to reduce income inequality, unemployment and poverty, signaling improvement in economic development. This validates the health-led growth hypothesis and corroborates evidence from studies such as Ibe and Olulu-Briggs (2015); Bedir (2016); Piabuo and Tieguhong (2017) and Ndaguba and Hlotywa (2021) which found that healthcare expenditure is positively and significantly related to economic growth.

5. Summary, Conclusion and Policy Recommendations

This chapter presents a summary of findings of the study, the conclusion and some policy recommendations. Furthermore, the chapter presents some contributions to knowledge and makes suggestions for further studies in line with the research.

5.1. Summary of Findings and Conclusion

This study examines the effect of public and household health expenditures on economic development in Nigeria, given the assumed complementarity of improved health status of the population with development. This study focuses on assessing the impact on economic development as measured by a composite economic development index using Seers' three fundamental Pillars of development: poverty, inequality and unemployment. The PCA was used to develop composite economic development index (PIU) as a linear combination of Gini index for income inequality, poverty headcount rate (POV) and unemployment rate. The summary of the findings are as follows:

1) Public health expenditure has no significant effect on economic development in Nigeria;
2) Household health expenditure significantly enhances economic development in the country.

In view of the findings, it can be concluded that economic development is enhanced by private health expenditure in the country.

5.2. Policy Recommendations.

Based on the findings of this study, the researcher has made the following recommendations:

1) Prioritizing and boosting investments in the public health sector through targeted budget allocations, efficient resource utilization, and strategic partnerships is a prudent policy recommendation. Enhancing healthcare infrastructure, workforce capacity, and health education, coupled with good governance marked by transparency and accountability, can stimulate economic growth and foster sustainable development in Nigeria.

2) To enhance household health expenditure, it is essential to mitigate healthcare costs by investing in infrastructure, implementing subsidies and improving on the already existing insurance schemes, ensuring equitable access to essential services, and concurrently addressing poverty. Updating health regulations for efficiency and transparency will reduce financial burdens on households, allowing resource allocation to education and skill development. This not only alleviates immediate financial strain but also cultivates a healthier, skilled workforce, fostering innovation and economic development in Nigeria.

5.3. Contributions to Knowledge

The study contributes to the existing literature in the following ways:

The study examined the effect of public and household health expenditure on economic development in Nigeria. The study stands out by addressing the use of imperfect proxies for economic development which introduces severe measurement errors in the empirical health-development literature. However, this necessitated the construction of a composite economic development index adapted from Seers Three-Pillar model which cover three components of poverty, inequality and unemployment to measure economic development in developing countries like Nigeria. A composite health status index was also constructed. This is a departure from previous studies that used RGDP, GDP, per capita income, HDI. This study tries to improve on the measurement of economic development used in the literature. In addressing this gap, the study employed a simultaneous equation using a three-stage least estimation which is an instrumental variable to correct the bias that results when a variable is behaving as both endogenous and exogenous variable in the same system of equations as against the granger causality used mainly by most previous studies.

5.4. Suggestion for further Studies

The application of more robust analytical techniques is recommended for future research and more of country specific studies are advised on similar study.

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