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Research Article

Assessment of the Impact of Government Health Expenditure on Economic Growth in Nigeria

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Abstract: This study evaluates the impact of government health expenditure on economic growth in Nigeria between 1992 and 2021 using the ordinary least squares model which was used to perform the estimation for the variables that were determined to be stationary at first difference were evaluated for stationarity. According to the model's estimated results, neither of the independent variables government capital or recurrent health spending has a discernible impact on Nigeria's economic expansion. The independent variables were not significantly significant, this could be attributed to the lack of strength of indirect effects and the time lag between ongoing healthcare costs and the overall economy. Additionally, in Nigeria, poor machine quality, unfinished projects, and corrupt officials might be blamed for health expenditures, which decreased the standard of healthcare and general wellness. The study recommended that the government should put in place the facilities needed for people to use healthcare and to maximize wellbeing to improve health outcomes and the government should ensure efficiency and transparency of health expenditure, alongside increased investment in the health sector to stimulate sustainable economic growth in Nigeria.

Keywords: recurrent health expenditure; capital health expenditure; economic growth; ordinary least square

1. Introduction

Economic growth remains a primary objective for most nations, particularly developing economies like Nigeria. Understanding the factors that drive or impede economic growth is vital for policymakers striving to improve the welfare of their citizens. One such factor is government expenditure, especially on critical sectors like health. Health expenditure is recognized as a key contributor to human capital development, which in turn influences economic productivity and growth. Health is a fundamental determinant of a nation's capacity to produce, and investments in health systems are often viewed as investments in the productive capabilities of the workforce (Dunne & Masiyandima, 2017). The role of government health expenditure in economic growth has thus garnered significant attention, particularly in the context of countries with limited resources and high health burdens, such as Nigeria. In theory, government expenditure on health influences economic growth through its impact on human capital. The endogenous growth theory, championed by scholars like (Nitte, 2023), underscores the significance of human capital – including education and health – as essential drivers of sustainable growth. This theory posits that government investments in health lead to an improvement in the health status of the population, which subsequently increases labor productivity, reduces mortality and morbidity rates, and fosters long-term economic growth (Olayiwola & Olusanya, 2021). Healthy individuals are more likely to contribute effectively to the workforce, exhibit higher productivity, and reduce the economic burden associated with illness and premature death.

In practice, however, the effectiveness of health expenditure in driving economic growth is contingent on several factors, including the adequacy, efficiency, and management of resources allocated to the health sector (Musa, Magaji & Tsauni, 2022). In many developing countries, including Nigeria, government health expenditure has been inconsistent, with resources often being insufficient to meet the growing healthcare needs of the population (World Bank, 2020). Nigeria, with a population exceeding 200 million people, faces significant

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health challenges, including high rates of maternal and child mortality, infectious diseases, and inadequate healthcare infrastructure (UNDP, 2021). As a result, questions about whether increased government spending on health translates into improved health outcomes and, consequently, economic growth, remain pertinent.

Historically, Nigeria's health expenditure as a percentage of its total government expenditure has fluctuated over the years. According to the World Health Organization (WHO) statistics, Nigeria's health spending has generally been below the recommended levels for achieving universal health coverage (WHO, 2021). The period from 1992 to 2021 witnessed various economic challenges, including periods of economic recession, fluctuating oil prices, and political instability, all of which influenced the country's fiscal policies, including health financing. These challenges often resulted in underinvestment in the health sector, leading to suboptimal health outcomes despite the country's commitment to improve healthcare delivery through initiatives such as the National Health Insurance Scheme and other health reforms (FMOH, 2016).

Despite these investments, Nigeria's health indicators remain among the worst in the world. For example, life expectancy in Nigeria was 54.81 years in 2021, one of the lowest globally (World Bank, 2021). Similarly, the country grapples with high rates of infant and maternal mortality, with an under-five mortality rate of 117 per 1,000 live births (UNICEF, 2021). These poor health outcomes suggest that while the Nigerian government allocates resources to health, the effectiveness and efficiency of these expenditures in improving population health – and by extension, economic productivity – are debatable. This inefficiency can be attributed to various factors, including corruption, misallocation of funds, poor governance, and inadequate healthcare infrastructure (Dunn & Masiyandima, 2017).

However, several studies have attempted to empirically establish the link between government health expenditure and economic growth in Nigeria. For instance, Awoyemi, Makanju, Mpapalika, and Ekpeyo (2023) found that increased government spending on health positively influenced Nigeria's economic growth by improving labor productivity. Similarly, Sethi, Mohanty, Das, and Sahoo (2024) demonstrated that health expenditure had a positive but statistically insignificant effect on Nigeria's gross domestic product (GDP) growth. These mixed results reflect the complexity of the relationship between health spending and economic growth, highlighting the need for further investigation into how health financing can be optimized to achieve better economic outcomes.

The period between 1992 and 2021 is of particular interest due to several key events that shaped Nigeria's economy and health sector. These include the structural adjustment policies of the early 1990s, democratic transitions in 1999, the global financial crisis of 2008, and the economic recessions of 2016 and 2020. These events had direct implications for government spending patterns, including health expenditure. For example, during periods of economic recession, government revenue typically contracted, leading to budgetary cuts in health and other social sectors (National Bureau of Statistics, 2021). On the other hand, periods of economic growth and stability saw increased allocations to health, albeit insufficient to meet the burgeoning health demands of the population.

Therefore, this study seeks to analyze the assessment of the impact of government health expenditure on economic growth in Nigeria from 1992 to 2021 and the specific objectives are to seek at the relationship between government health expenditure on economic growth and the link between the government health expenditure and economic growth in Nigeria. By investigating the extent to which health spending influences economic outcomes during this period, the study aims to provide insights into how health investments can be better leveraged to enhance economic performance. The analysis will not only assess the magnitude of health expenditure's impact on GDP growth but also explore the challenges that may have hindered the effective translation of health spending into improved economic productivity. In doing so, this study contributes to the broader discourse on the role of health investments in fostering sustainable development in Nigeria and similar developing economies.

2. Literature Review

2.1. Conceptual Review

Three basic concepts need to be reviewed in this study; the concept of health, government health expenditure, and economic growth.

2.1.1. Concept of Health

The modern understanding of health became official when the WHO, at the time of its establishment in 1948, included the definition of health in its constitution. The definition was proposed by Andrija Štampar, a prominent scholar from Croatia in the field of social medicine and public health and one of the founders of the WHO. This generally accepted definition states that "health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 1948). This definition promoted for the first time that, in addition to physical and mental health, social welfare is an integral component of overall health, because health is closely linked to the social environment and living and working conditions. The WHO definition links health explicitly with well-being and conceptualizes health as a human right requiring physical and social resources to achieve and maintain. 'Wellbeing' refers to a positive rather than neutral state, framing health as a positive aspiration. Within the last few decades, the WHO definition of health has been increasingly amended and supplemented by the fourth dimension "spiritual health". Generally speaking, spiritual health involves a sense of fulfillment and satisfaction with our own lives, a system of values, self-confidence and self-esteem, self-awareness and presence, peacefulness and tranquility with dynamic emotional balance, both internal and toward the environment, morality and truthfulness, selflessness, positive emotions, compassion and willingness to help and support others, responsibility and contribution to the common good, and successful management of everyday life problems and demands as well as social stress (Donev, 2014).

Few, if any, people will ever experience complete physical, mental, and social well-being all the time, which can make this approach unhelpful and counterproductive. Another major criticism of this view of health is that it is unrealistic because it "leaves most of us unhealthy most of the time" (Smith, 2008; Godlee, 2011). It neglects to account for the increasing number of people who live with chronic illnesses and disabilities, not simply those who experience brief periods of bad health. Furthermore, it could be claimed that through pathological suboptimal health conditions, the goal of "perfect" health promotes the over-medicalization of society.

A new definition of health as 'the ability to adapt and to self-manage' was proposed (Huber et al., 2011). It includes the ability of people to adapt to their situation as key to health. It also acknowledges the subjective element of health; what health and well-being mean will differ from one person to the next, depending on the context and their needs. This is considered by many to be a limitation of broader definitions of health because well-being is neither objective nor measurable. A limitation of this approach is that it is very individualistic and takes little account of the wider determinants of health Responsibility for health is seen as individual rather than collective, with little scope to promote it as a human right.

2.1.2. Government Health Expenditure

Healthcare spending is defined as the final consumption of healthcare goods and services (i.e. current health expenditure), which includes both personal health care (curative care, rehabilitative care, long-term care, ancillary services, and medical goods) and collective services (prevention and public health services, as well as health administration), but excludes investment expenditures. Wanjiru (2019) explains that government spending on education and health sectors leads to the economic growth and build-up of human capital that will be more resourceful and adequately creative to enhance economic growth. Accordingly, government expenditure is an outflow of resources from the government to other sectors of the economy whether requited or unrequited. It is divided into capital and recurrent expenditure. Recurrent expenditures are payments for ongoing items like salaries and overheads, which are paid in the current period usually every month while the other hand Capital expenditures are payments made to acquire, repair, upgrade, or maintain fixed assets (the obligation continues over some time).

The pattern of health financing is thus linked to the provision of health services. There are various means of health care financing. These sources include tax-based public sector health financing, household out-of-pocket health expenditure, the private sector (donor funding), and health insurance among others. External financing of health care includes grants and loans from donor agencies like the World Bank, the WHO, and the European Union among others (Rossiter et al., 2017).

In Nigeria, the broad classification of public expenditure into recurrent and capital while capital can be further categorized into four namely; administration, economic service, social and community services, and transfers. Government healthcare spending falls under the provision of social services. General government expenditure on health refers to expenditures incurred by central, state/regional, and local government authorities, excluding social security

schemes.

2.1.3. Economic Growth

The economic growth concept provides both quantitative and qualitative characteristics. Quantitative characteristic shows us changes in the amount of produced goods and services, reflecting the dynamics of these changes; qualitative characteristics point to the possibilities of the economic system in meeting the new growing needs of society. Because it is a non-static, moving, and changing process, it has always a numerical index for a certain date. Economic growth is characterized by the dynamics of such absolute macroeconomic indicators as GDP, gross national product (GNP), national income, and others. The relative indicators of economic growth that characterize it from the quantitative side are the value of GDP per capita, disposable income of the population per capita, and also attributable to per capita indicators of consumption, savings, and investments. The rates of industrial production growth as a whole and for the main sectors and types of products, indicators of economic efficiency, for example, labor productivity, are also being considered (Magaji et al., 2022). The qualitative aspect of economic growth is determined by living standards and quality of life indicators. The living standard is estimated by consumer basket, cost of living, GDP structure by use; level of services development (the number of doctors per 10 thousand people, the number of hospital beds per 1 thousand people, etc.); state of the labor forces (average life expectancy, level of education, share of education expenditure in GDP, etc.), and others. The quality of life is reflected by the content of labor and leisure activities, level of labor and life comfort, environment, functioning of social institutions (Ibrahim & Sule, 2023).

Ukwueze and Aguegboh (2018) state that economic growth is a long-term process wherein the substantial and sustained rise in real national income, total population, and real per capita income takes place. In addition, economic growth is the expansion of the system in one or more dimensions without a change in its structure. Thus, economic growth is related to a quantitative, sustained increase in the country's per capita output or income accompanied by an expansion in its labor force, consumption, capital, and volume of trade. Todaro and Smith (2015) define economic growth as the steady process by which the productive capacity of the economy is increased over time to bring about rising levels of national output and income. Economic growth is a long-term rise in the capacity to supply increasingly diverse economic goods to its population (Magaji & Musa, 2015). Aggregate economic growth is measured in terms of GNP or GDP, although alternative metrics are sometimes used. In a nutshell, economic growth is an increase in the capacity of an economy to produce goods and services, compared from one period of time to another (Musa, Magaji & Salisu, 2022). It can be measured in nominal or real terms, the latter of which is adjusted for inflation. Economic growth can be positive, zero, or negative.

2.2. Theoretical Review

This study is underpinned by neoclassical growth theory that is an economic theory developed to supersede the Harrod-Domar growth theory (Harrod & Domar, 1956) by addressing the criticism and shortcomings of the theory. Harrod-Domar theory was criticized based on; the instability of the equilibrium growth path, the reliance on the multiplier effect, and the assumption of productivity as the only factor of production that affects output growth. The Solow-Swan theory is a model of capital accumulation in a pure production economy (Solow, 1956). His explanation of economic expansion describes how the interaction of the three economic forces of labor, capital, and technology leads to a stable pace of economic growth. An economic growth model that explains long-term economic growth in neoclassical economies is the Solow-Swan model. It illustrates how the role played by various amounts of labor or population expansion and capital in the production process leads to long-term economic equilibrium. Labor being a function of health can therefore be increased by individuals spending a good amount of money on their health and also the government making available quality health care services and facilities in order to improve quality health in its citizens and also increase the production capacity of the citizens. In the production function, it also included technology as an exogenously determined element. Therefore, the thesis contends that technical advancement has a big impact on how an economy runs as a whole. Hence, the theory argues that technological change significantly influences the overall functioning of an economy. The neoclassical growth model claims that capital accumulation and how it is used in an economy is important for determining economic growth.

2.3. Empirical Review

Musa and Ismail (2023) investigate the impact of government expenditure on Nigeria's economic growth rate from 1970 to 2020 is analyzed. OLS was used to estimate the connection between the variables over the long run. The findings show a positive link between the log gross domestic products (LGDP) and its initial lag, which is statistically significant. The result reveals a positive association between the LGDP and the log of recurrent government expenditure (RGE), as well as between the LGDP and the log of the first leg of RGE. A positive link exists between the LGDP and the log of capital government expenditure (CGE), but a negative relationship exists between the LGDP and the log of the first CGE. The link between the LGDP and the domestic debt of the federal government (LFGDD) is inverse, while the relationship between the LFGDD is positive. The R2 determination coefficient is 0.698968. The outcome demonstrates that explanatory factors account for 70% of the variation in the LGDP. The model is acceptable since the F-statistic 3595.905 with a probability of 0.000000 is significant at 1%. The long-term trend of the explanatory variables, which has increased since the year 1985, is linked to GDP. The outcome presented above also depicts the predicted short-run relationship. Therefore, it is recommended that government expenditure be examined and bolstered to have a positive impact on Nigeria's growth rates.

Nitte (2023) investigates the nexus between economic growth, health, and education expenditure in Nigeria, using time series data for the period of 28 years (1990-2018). The study adopts the use of the Philips-Pheron test for unit root, the auto-regressive distributed lag model (ARDL) bound test procedure to co-integration, and the OLS method to estimate the relationship between the parameters used in the study. The findings revealed that all variables are stationary at first difference I (1), the result of the ARDL bound test indicates that a long-run relationship exists between economic growth, health, and education expenditure, and both education and health expenditures are good determinants of growth as revealed by the regression result. The study concludes that recurrent expenditures on health and education are required for economic growth and development, which thus affects the standard of living and life expectancy which goes a long way in contributing to aggregate output. Therefore, the study calls for the urgent need for policymakers to ensure budgetary allocations on education and health are given preeminence. The results from the work conform to the a-prior expectation and also the methodology used for analysis is not suitable for the work.

Olayiwola, Bakare-Aremu, and Abiodun (2021) investigate the impact of public health expenditure on economic growth in Nigeria. OLS methodology was employed to analyze the time series data sourced from the CBN statistical bulletin in the course of the study ranging from 1995-2015. The regression analysis result establishes that there is bidirectional causality between government spending on health and economic growth in Nigeria. Health spending has a positive and significant effect on economic growth in Nigeria with a coefficient of determination of 98%. Recommendation was made that recognition of the fact that an increase in government spending enhances the growth of the economy. This necessitates that there should be an increase in funding for the health sectors; more so concerted efforts should still be committed to funding crucial projects that will culminate to evident outcomes in the health sectors. Also, the government would need to establish new partnerships with the stakeholders in private businesses in the sector where its relevance is gradually declining) to mobilize the necessary resources to stimulate efficiency. International organizations should also be contacted for development assistance in conformity with their commitment to African countries. The methodology is too simplistic for the study and the results conform to a prior expectation.

Sinha and Mbulawa (2023) examine the relationship between government expenditure on health and economic growth in Botswana. The study set out to test the existence of cointegration and specification of the deterministic components with special reference to the Pantula Principle which helps to overcome the shortfall of the method by Johansen, which may lead to spurious results by omitting the presence of deterministic components in the analysis. The cointegration approach is used and tested using three methods by Engle and Granger (1987) or EG, a procedure suggested by Johansen (1988), an error correction model (ECM) approach proposed by Granger (1988), and short-run analysis using the pairwise granger causality tests. Findings show that the correct model specification for testing long-run relationships consists of one cointegrating vector with a constant which is the most restrictive hypothesis according to the Pantula principle. Using the Johansen approach, total health expenditure and recurring health expenditure have a cointegration relationship with growth while development health expenditure and growth are not cointegrated. The ECM

and the approach by EG confirm a weak and/or no cointegration between the variables. Growth has no effect on government expenditure on health in the short run, but a cointegration relationship suggests that it may marginally contribute to an increase in health expenditure over the long term. The study clarifies the correct model to test for cointegration and specification for the deterministic component. It confirms the existence of a healthcare expenditure-led growth hypothesis. This requires Botswana to design a policy that targets specific parts of recurrent and development health expenditure to support human capital development and influence future growth. The study is thorough in the sense that it uses a more sophisticated model of study making the analysis good for policy making.

Azuh, Osabohien, Orbih, and Godwin (2020) examine the impact of health government expenditure on under-five child mortality in Nigeria for a period of 1986 to 2022. The pre-estimation and post-estimation tests were descriptive statistics, correlation matrix, ADF-Fisher Unit Root test statistic, Johansen co-integration test, Ramsey Reset test, and Breuch-Godfrey Serial Correlation LM Test respectively while the data analytical technique was ECM technique. These variables of the study consist of under-five child mortality (CHILDMOR); government health expenditure (GHEXP), recurrent health expenditure (RHEXP), capital health expenditure (CHEXP), domestic private health expenditure (DPHEXP), and adult literacy rate (15 and above) (ADULT). The empirical results show that government health expenditure has a positive and significant impact on under-five child mortality because probability value of 0.0016 which is less than 0.05; The trace statistics of the Johansen co-integration test identify that there are four (4) co-integrating equations (s) at the 5 percent level of significance. Thus, there is a long-run relationship among the variables and there is a non-directional relationship between government health expenditure and under-five child mortality while there is a bi-directional relationship between adult literacy rate and under-five child mortality. Again, there is no causal relationship among recurrent health expenditure, capital health expenditure, domestic private health expenditure, and under-five child mortality. The study recommends that the Nigerian government should improve the allocation and release of funds to the health sector and monitor the same to ensure the effective utilization of such funds. This will help to see that such monies are channeled into socially desirable targets that can improve the economy. The regression technique used is advanced and the results conform to a-prior expectations. Also, the work is recent and therefore can be used to solve recent economic problems.

Awogbemi (2022) explores the impact of health expenditure on Nigeria's economic growth for the period between 2000 and 2021. Error Correction Model Estimates (ECME) were adopted to empirically examine the impact of repressors on the dependent variable. The descriptive analysis of the data reveals that the emphasis is on recurrent expenditure rather than capital expenditure. The empirical results using the ECME did not find support for increasing health expenditure as it negatively affects economic growth in Nigeria both in the short-run and the long-run. It is concluded that though government expenditure on health is very vital, emphasis must be placed on capital expenditure to a reasonable extent. Therefore, the Nigerian government should intensify efforts towards increasing the Abuja declarations of allocating at least 13-15 percent of the annual budget to the health sector for effective funding as well as focus more on health outcomes and its impacts on economic growth in Nigeria. The research is recent and used the right estimation techniques but its result does not conform to a-priori expectations.

The study of Indanazulfa and Irwandi (2022) analyzes the effect of government health expenditure on economic growth in ASEAN-9 countries. This study is based on panel data of a sample of 9 countries in ASEAN consisting of Indonesia, Malaysia, Singapore, Thailand, Philippines, Brunei Darussalam, Myanmar, and Cambodia, using data for the period 2000-2019. Empirical results find that health expenditure as a percentage of GDP has a positive effect on economic growth, while out-of-pocket expenditure of the population has a negative significant effect on economic growth. However, the health expenditure per capita and government health expenditure have no significant effect on economic growth. This suggests that there needs to be an increase of focus on investment and the speed of developing medical services and public health efficiency to improve public health and economic growth. The work used a simple regression analysis, the year is recent and while health expenditure of GDP conforms to a-prior expectation, other forms of health expenditure listed above do not.

Misango, Siele, and Kemboi (2022) assess the impact of health expenditure on economic growth in Kenya as one of the health indicators hindering the growth rate. The study adopted the endogenous growth theory and incorporated key health expenditure into the model as a function of human capital. The research design employed was explanatory and relied on

secondary data from the World Bank from 1987 to 2018. Applying the regression model, the results revealed that the coefficient of healthcare expenditure was 0.3032, which was positive and insignificant at a 5 percent level. This implied that for every one percent increase in the coefficient of healthcare expenditure, the GDP growth rate could increase by 0.3032 %. The study recommended that the Kenyan government put in place health policies promoting citizens' health under the social pillar and also increase allocation to health care to promote economic growth. The year scope is outdated and therefore cannot be used to assess the relationship between government health expenditure and economic growth in Kenya today.

F. Ojo and A. Ojo (2022) examine Nigeria's health expenditure, education, and economic growth, spanning from 1995 to 2019. This study used principal component analysis (PCA) to calculate variables such as the education expenditure index (EEI) and the health expenditure index (HEI), as well as other explanatory factors such as inflation (INF), life expectancy rate (LER), maternal mortality rate (MMR), and GDP growth. The study used ECM as an estimating approach. According to the empirical data, government disbursement on education and health has a positive and considerable impact on economic growth and interaction. The research suggests that the government should enhance current health and education facilities to encourage economic growth. The methodology used for this work is advanced and sophisticated and it shows that there is a positive relationship between health and education expenditure and economic growth.

Ivankova, Gavurova, and Khouri (2022) investigate the relationship between health spending, treatable mortality, and economic productivity in Organization for Economic Co-operation and Development (OECD) countries. The data covered the period from 1994 to 2016. Descriptive analysis, regression analysis, and cluster analysis were used to achieve the main objective. The results of the regression analysis reveal negative relationships between health spending and treatable respiratory mortality in countries with a tax-based health system for male and female working-age populations, as well as in countries with an insurance-based health system for male population. This means that higher health spending was associated with lower treatable respiratory mortality. Also, lower treatable mortality was associated with higher GDP, especially in the male-productive population from countries with an insurance-based health system. Higher spending on health could help countries from both a health and economic point of view and this should not be forgotten in the creation of public policies. In particular, countries with underfunded health systems should increase their health spending. In this study, countries with a tax-based health system were characterized by higher health spending, lower rates of treatable mortality from respiratory system diseases, and higher GDP compared to countries with an insurance-based health system. The results of the study provide a closer look at the health systems applied in OECD countries. In this context, the consideration of health systems is undoubtedly beneficial for future research efforts. The research work is outdated and therefore more recent research should be conducted to enable references to the research work.

Yerima, Nymphas, Sani, Aauta, Amos, and Abwage (2022) assess the impact of government expenditure on economic growth in Nigeria using time series data from 1986-2020. Structural vector auto-regression (SVAR) model and the pair-wise causality test were adopted. The study observed that government expenditure on health and education had an insignificant impact on economic growth. The result also shows that public debt has an insignificant impact on economic growth. The study recommended that Government expenditure on education and health should be increased significantly to at least meet up with regional and global expenditure benchmarks and that the government should minimize the incidence of borrowing especially with about 92% of the revenue generated going for debt servicing for borrowings that are largely non-productive. The work does not conform to a prior expectation of a positive relationship between health and economic expenditure on economic growth.

Olayiwola and Olusanya (2021) examine the impact of health financing on economic growth in Nigeria using the ARDL estimation technique with time series data from 1990 – 2020. The results show that the previous year productive activities have a growth effect on economic growth both in the short-run and the long-run. The current domestic government general health expenditure has a negative growth effect on economic growth while the previous year's domestic general government expenditure on health improves economic growth. Also, current out-of-pocket health expenditure negatively affects economic growth while the previous year's out-of-pocket health expenditure improves economic growth. The domestic private health expenditure has a significant positive growth effect on the economic growth. The result also strengthens the importance of private health spending rather than

government health expenditure in improving economic growth. Therefore, it was concluded that health financing is necessary for sustainable economic growth. Hence, the government should enhance individual health spending ability, increase health sector budgetary allocation, and ensure prudent and effective budgetary implementation for the health sector. The study is thorough in the sense that it uses a more sophisticated model for the study, and is more diverse than other studies.

Ebhotemhen & Hezekiah (2021) carried out an empirical investigation on the impact of public health expenditure on the Nigerian health sector performance beginning from 1995 to 2020 by employing ARDL. The study ascertained stationarity of the time series properties of the variables where Augmented Dickey-Fuller (ADF) was applied and the ARDL bounds test results confirm the rejection of no long-term equilibrium relationship among the variables. The results of the error correction mechanism (ECM) accentuated the connection between public healthcare expenditure and health sector performance in Nigeria through the establishment of a stable long-term equilibrium relationship among the variables employed in the model. Therefore, this study recommends not only an increase in the budgetary allocation to the health sector but also establishing a platform that will ensure probity and accountability in the health sector. This will in turn lead to an improvement in the health sector performance necessary for building human capital in Nigeria. The year range is recent and it also uses an advanced model for data analysis the results show that there is no long-run relationship between the dependent and independent variables which is against the a-prior expectation.

This study seeks to bridge the gaps in information already identified by using up-to-date data for analysis covering forty years using the differenced OLS estimation technique to view how healthcare spending has affected the economic growth of Nigeria as a whole all of which provides current information that applies to contemporary situation in Nigeria. It is believed that an increase in healthcare spending results in a rise in the number of the healthy labor force which is an indicator of a rise in the human capital of the country and thereby increasing the productivity of labor which will give a rise in economic growth. Having reviewed the scientific literature, it was identified that some of the techniques adopted by researchers in their study were too simplistic and the information obtained from the majority seemed to be out of date due to the use of an outdated period analysis. Also, in some cases, the period of analysis was too short.

3. Materials and Methods

3.1. Research Design

The research design is the overall strategy that one chooses to integrate the different components of the study coherently and logically. This is done to ensure that one effectively addresses the research problem. Research design constitutes the blueprint or the roadmap for the collection, measurement, and analysis of data. The econometric techniques used in the analysis of the time series data. This study employed quantitative secondary data and analyzed this data with the software E-views 9.0 to generate an appropriate result for the research work.

3.1.1. Model Specification

Model specification is the mathematical and econometric representation of the relationship that exists between the dependent and independent variables. (Koutsoyiannis, 1997) emphasized the relevance of expressing the relationship between the dependent and independent variables in mathematical and econometrics forms. In this research, GDP is used as the dependent variable while government capital health expenditure and government recurrent health expenditure government are the independent variables.

Therefore, to determine the relationship between government health expenditure and economic growth, this research will adopt the model used by Chandana, Adamu, & Musa (2024) in their work "Impact of Government Expenditure on Economic Growth in Nigeria, 1970 -2019" stated as:

$$GDP = (CAP, LF, REC, TPN, INF, NOILR) \quad (1)$$

Where:

GDP = Gross domestic product, CAP = capital expenditure, LF = Labor force, REC = recurrent expenditure, TPN = Trade openness, INF = Inflation, NOILR = Non-oil revenue.

The adjusted equation goes as follows:

$$RGDP = f(GRHE, GCHE) \quad (2)$$

Where:

RGDP = Gross Domestic Product
GCHE = Government capital health expenditure
GRHE = Government recurrent health expenditure

3.1.2. Econometric Specification

$GDP = \alpha + \beta 1GCHE + \beta 2GRHE + \mu$……...…….... (3)

Where:

α = the intercept or constant of the regression line
$\beta 1$=Parameter coefficient of Government capital health expenditure
$\beta 2$= Parameter coefficient of Government recurrent health expenditure
μ = error term or stochastic term.

μ is the intercept that captures the state of the dependent variable (GDP) as other independent variables are constant $\beta 1$ and $\beta 2$ are coefficients attached to independent variables, which explains the effect of a unit change in the independent variables on the dependent variable (GDP). By a way of extension and using the knowledge of the econometric model to link the dependent variable GDP to the independent variables, a stochastic term (μ) is introduced to capture all other factors that could impact economic growth other than the ones already identified on the right-hand side of the equation.

Therefore, from the model adapted; Labor force, Trade openness, Inflation, and Non-oil revenue are removed from the model as they are not needed for the research whereas GDP, Government capital health expenditure, and Government recurrent health expenditure are used as they conform to the objectives the research work.

3.2. Instruments and Procedures

3.2.1. Unit Root Test

The unit root test was used to check for stationarity and non-stationarity of the variables using the Augmented Dicker-fuller (ADF) method. In statistics and econometrics, an ADF test is a test for a unit root in a time series sample. It is an augmented version of the Dickey-Fuller test for a larger and more complicated set of time series models. The ADF statistic, used in the test, is a negative number. The more negative it is, the stronger the rejections of the hypothesis that there is a unit root at some level of confidence.

3.2.2. Cointegration Test

When two series tend to diverge in the near term but come together over time, this is known as cointegration. Johansen's cointegration test procedure was used to determine whether or not the variables are co-integrated. Because Cointegration results can be very sensitive to the lag length selected. A lack of co-integration suggests that such variables have no long-run relationship and the differences in the Vector Autoregression Estimates can be estimated. If there exists cointegration, we can estimate the model with the Vector Error Correction Mechanism.

3.2.3. Justification for Estimation Technique

In this study, the BLUE (Best, Linear, Unbiased Estimator) Ordinary Least Square (OLS) method will be used to estimate our model. The coefficients of the variables will be employed while employing the OLS estimator to ascertain their impact as well as the correlation between the dependent and independent variables. The statistical significance of the results from the estimation will be assessed using the t-value (t-calculated and t-tabulated), the adjusted R2, the probability values, and the level of significance.

3.3. Data Analysis

3.3.1. The Coefficient of Determination (R2)

This measures a regression model's goodness of fit. It displays the percentage of the dependent (endogenous) variable's overall variation or changes that can be accounted for by the independent variables. It is employed to assess the degree to which the independent variables in the linear regressions can adequately explain the dependent variable. R2 has a value between 0 and 1. The goodness of fit is determined by how near the R2 is to 1, with a closer R2 to zero indicating a worse match. Therefore $0<R<1$

3.3.2. T-Test

T- Test tests for the statistical significance of individual regression coefficient that is it tests the level of significance of each independent (exogenous) variable in explaining the changes in the dependent variable (endogenous). The t-test is a test used for hypothesis testing

in statistics and uses the t-statistic, the t-distribution values, and the degrees of freedom (n-k) to determine statistical significance. Where n=number of samples and k=number of parameters.

If T-calculated > T-tabulated, reject the null hypothesis.

If T-calculated < T- tabulated, do not reject the null hypothesis.

F-Statistics

F-test is carried out to test the overall significance of the whole regression that is to test the effect of all the independent variables (exogenous variables) on the dependent variable (endogenous variable). The calculated F-value is compared at a 5% level of significance and a decision is taken.

If F-calculated > F-tabulated, reject the null hypothesis.

If F-calculated < F- F-tabulated, do not reject the null hypothesis.

3.3.3. Economic Criterion

The a priori expectation of the parameter estimates of the variables employed in the model is one of the theoretical criteria used in this evaluation. The magnitude and signs of the parameter estimations will be taken into consideration to determine whether or not they are consistent with both the economic theory and a priori expectations. In the economics literature, the term "a priori" refers to the idea that something is true because of previous reasoning or because of empirical data.

The a priori expectation states a positive relationship between government recurrent health expenditure and economic growth and also a positive relationship between government capital health expenditure and economic growth.

RGDP since it is the dependent variable has no sign.

OOP negative (+) and GE positive (+)

4. Results

4.1. Trend Analysis of the Variables

This section shows the trend of all subject variables from 1992 to 2021. It enables us to observe the behavior of the variables over time. This will help in the ability to predict or forecast future behavior.

Figure 1 shows the trend of the real gross domestic product (RGDP). It had a slight downward trend from 1995 to 2000, with a relatively fluctuating rising trend till 2010. From 2011 showed an upward trajectory in trend, reaching its peak in 2020, and continuously increasing to 2021.

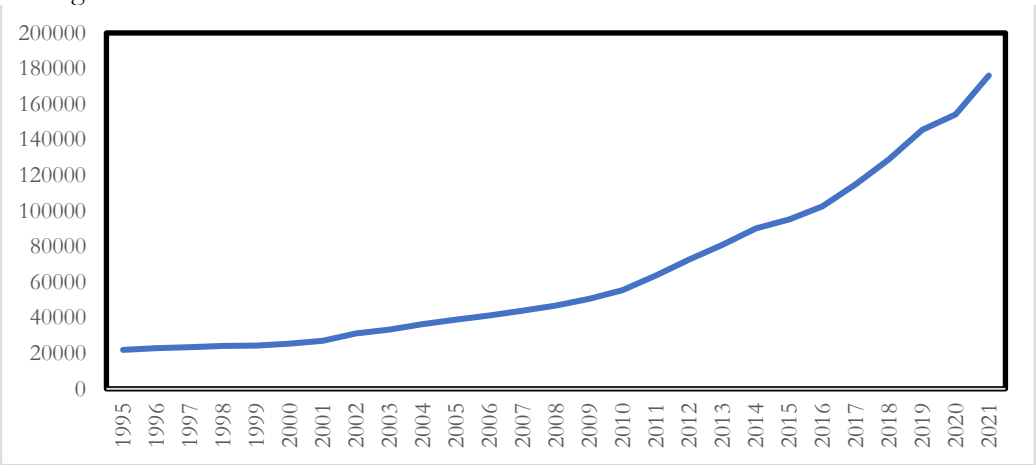

Figure 1. RGDP between 1992 and 2021.
Source: Author generated using E-Views 9, 2024.

Figure 2 shows the trend of capital health expenditure in Nigeria. It depicts a flat trend from 1995 to 1992. Post 1992 witnessed a slight increase, followed by a zig-zag trend till 2005. Consequently, the government capital health expenditure witnessed a sharp rise from 2006 to 2007 and maintained a slight fall down to 2010 and again a zigzag trend from 2011 to 2016 which was accompanied by a sharp rise to 2019, a fall in 2020, and finally a rise in 2021.

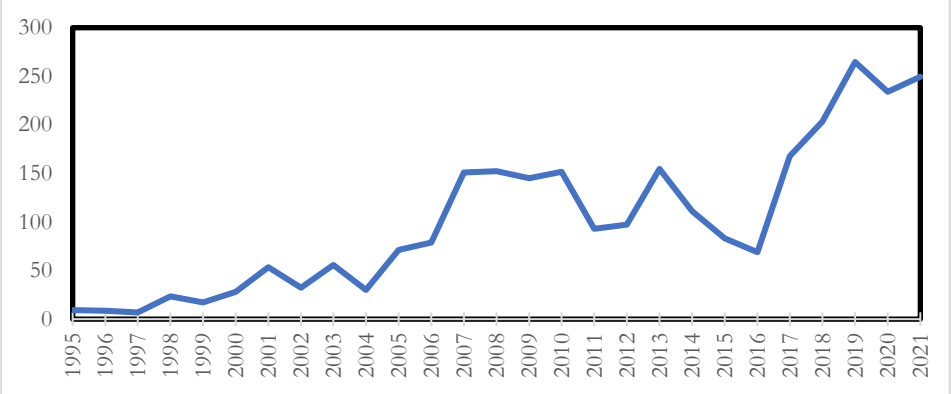

Figure 2. Government capital health expenditure between 1995 and 2021.
Source: Author generated using E-Views 9, 2024.

Figure 3 shows the trend of government recurrent health expenditure. It showed a flat trend from 1995 to 1985. With a fluctuating increase till 2010 accompanied by a sharp increase in 2011 to 2012 subsequently a zigzag trend from 2013 to 2015. Post 2015 to 2020 witnessed a rise and finally a fall in 2021.

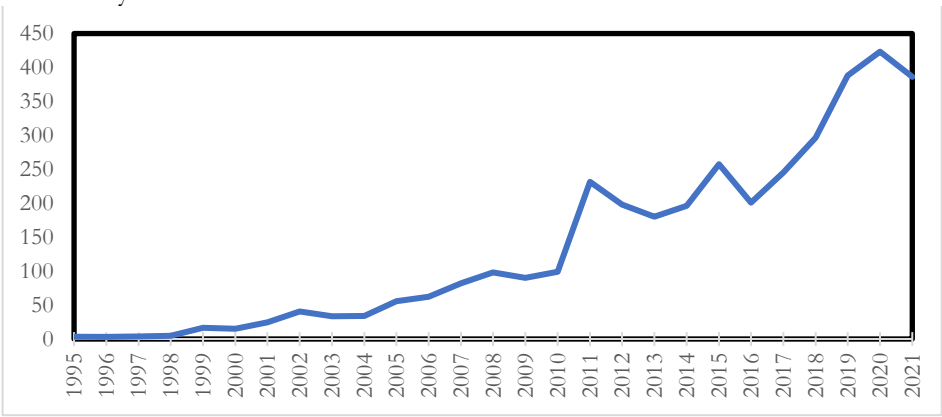

Figure 3. Government recurrent health expenditure between 1995 and 2021.
Source: Author generated using E-Views 9, 2024.

4.2. Descriptive Statistics of the Variables

Table 1 displays the variables' mean, standard deviation, maximum, minimum, and other values. The statistical properties of the data used are displayed using descriptive statistics.

Table 1. Descriptive statistics of the variables.

	RGDP	GRHE	GCHE
Mean	49830.82	89.74769	67.45831
Median	26935.32	24.52227	30.03252
Maximum	176075.5	423.3300	264.6905
Minimum	16211.49	0.041315	0.237600
Std. Deviation	42847.75	123.8772	78.58811
Skewness	1.485554	1.338241	1.038013
Kurtosis	4.152209	3.630601	2.946619
Jarque-Bera	17.34823	12.91708	7.367587
Probability	0.000171	0.001567	0.025127
Sum	2043064.	3679.655	2765.791
Sum Sq. Dev.	7.34E+10	613822.3	247043.7
Observations	41	41	41

Source: Author generated using E-Views 9, 2024.

4.2.1. Unit Root Test

The unit root test is used to determine whether or not the variables are stationary over time. Test statistics and critical values are compared to determine whether a variable is stationary; if the estimated t-value is greater than the absolute value of the critical values, the variable is stationary; if the opposite is true, the variable is not stationary. To improve the predictability of the model, stationarity essentially calls for the data's mean and variance to be pretty constant. Table 2 displays the outcomes of the ADF and Phillip Perron tests used to perform the unit root test on all-time series data.

Table 2. Unit root result using ADF and Phillip Perron.

Augmented Dickey-Fuller (ADF)							
At level				At first difference			
variable	ADF stat	5% level	Prob. Value	ADF stat	5% level	Prob. Value	Order of Integration
LRGDP	-1.810163	-3.526609	0.6811	-4.045540	-3.536601	0.0156	I (1)
LGRHE	0.049068	-3.540328	0.9954	-5.604666	-3.540328	0.0003	I (1)
LGCHE	-2.990986	-3.526609	0.1473	-9.667665	-3.529758	0.0000	I (1)
Phillip Perron Test							
At level				At first difference			
variable	PPT stat	5% level	Prob. Value	PPT stat	5% level	Prob. Value	Order of Integration
LRGDP	-1.712728	-3.526609	0.7270	-4.703819	-3.529758	0.0028	I (1)
LGRHE	-3.411311	-3.526609	0.0641	-21.51359	-3.529758	0.0000	I (1)
LGCHE	-3090809	-3.526609	0.1223	-10.02630	-3.529758	0.0000	I (1)

Source: Computation by researcher using E-Views 9, 2024.

The rule is that, whenever the probability value is less than 5%, we accept that the variable is stationary; nevertheless, when the probability value is greater than 5%, the variable is not stationary.

The variables were not steady at the 5% level, as shown in Table 2. Then, after differencing all of the variables, it was discovered that they were all stationary at 5% in both tests at first difference. Since all of the variables are stationary at the same order of integration, I (1), signals the need for additional treatment and analysis, necessitating the use of the Johansen Cointegration Test to determine whether the equation has a long- or short-run connection. As a result, estimation using the OLS method will be used.

Before cointegration, the best lag was chosen, and lag length 1 was selected according to all lag length selection criteria (LR, FPE, AIC, SC, and HQ) (table 3). Therefore, since lag 1 has the most asterisks, we will utilize it for the model's estimation.

Table 3. Optimal lag selection.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-130.7237	NA	0.228663	7.038090	7.167373	7.084088
1	20.62453	270.8337*	0.000128*	-0.453923*	0.063210*	-0.269931*
2	26.90044	10.23964	0.000149	-0.310550	0.594432	0.011436
3	31.70298	7.077429	0.000191	-0.089631	1.203200	0.370349

Source: Computation by researcher using E-Views 9, 2024.

4.2.2. Co-integration Test.

Cointegration enables us to confirm if there is a long-run relationship among the variables. This will help us determine the long-run association among the variables for future forecasts and predictions.

The co-integration test result is shown in Table 4 below. The table demonstrates that there is no cointegration using trace statistics and the Max-Eigen value test since the probability value is greater than 5% under the null hypothesis of "None." As a result, we declare null and conclude that cointegration is absent.

Table 4. Johansen co-integration tests.

Trace Test				**Max-Eigen test**		
H_0	**Trace Statistic**	**0.05 level of sig**	**Prob. Value**	**Max-Eigen Statistic**	**0.05 level of sig**	**Prob. Value**
None	29.09567	29.79707	0.0601	18.92799	21.13162	0.0990
At most 1	10.16768	15.49471	0.2681	10.01291	14.26460	0.2111
At most 2	0.154766	3.841466	0.6940	0.154766	3.841466	0.6940

Source: Computation by researcher using E-Views 9, 2024.

4.2.3. Ordinary Least Square Estimation Result.

The outcome of the Johansson cointegration test yields no cointegration. We turned to the ordinary least model since it implies that there is no long-term link between the variables. The results showed a negative coefficient for government recurrent health expenditure and a positive coefficient for government capital health expenditure (Table 5).

Table 5. OLS estimation result.

Dependent Variable: DLOG(RGDP)					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
DLOG(GRHE)	-0.006081	0.012501	-0.486414	0.6295	
DLOG(GCHE)	0.008842	0.016673	0.530297	0.5991	
C	0.054815	0.009698	5.651927	0.0000	
R-squared	0.011928		Durbin-Watson stat		0.696044
Adjusted R-squared	-0.041481				
F-statistic	0.223341				
Prob.(F-statistic)	0.800913				

Source: Computation by researcher using E-Views 9, 2024.

4.2.4. Residual Diagnostics Tests Result

The findings of the Breusch-Godfrey Test of Serial Correlation are shown in the above table. The residuals of the variables are not serially associated, as indicated by the probability of 0.0002, which is less than 0.05. It suggests a relationship between successive residuals or error terms. As a result, the null hypothesis of no serial correlation is rejected since it does not satisfy the assumption of serial correlation, making predicting impossible.

The results of the Breush-Pagan-Godfrey test for heteroskedasticity are displayed in the above table. The residuals of the variables are homoscedastic since the probability of 0.5156 is greater than 0.05. It means that the error term is the same for each independent variable's variables. As a result, the variable coefficients are impartial and can be applied to predicting.

The results of the Jarque-Bera test's normalcy test are displayed in the table above. Given that the Jarque-Bera's value is 4.005012 and its probability value is 0.134997, which is greater than 0.05, the assumption of normality is satisfied because the residuals of the variables are normally distributed. In other words, it can be applied to policy and projections. Table 6

shows residual diagnostics tests result.

Table 6. Residual diagnostics tests result.

Residual Diagnostic tests	
Type of test	Prob.
Breusch-Godfrey Serial Correlation LM Test:	0.6170
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.5156
Jarque-Bera test	4.0050

Source: Computation by researcher using E-Views 9, 2024.

4.2.5. Stability Test Result

The CUSUM of squares graph above demonstrates that the variables are stable. As a result, the model shows stability concerning time order and can be applied to forecasting. Figure 4 shows the CUSUM of squares.

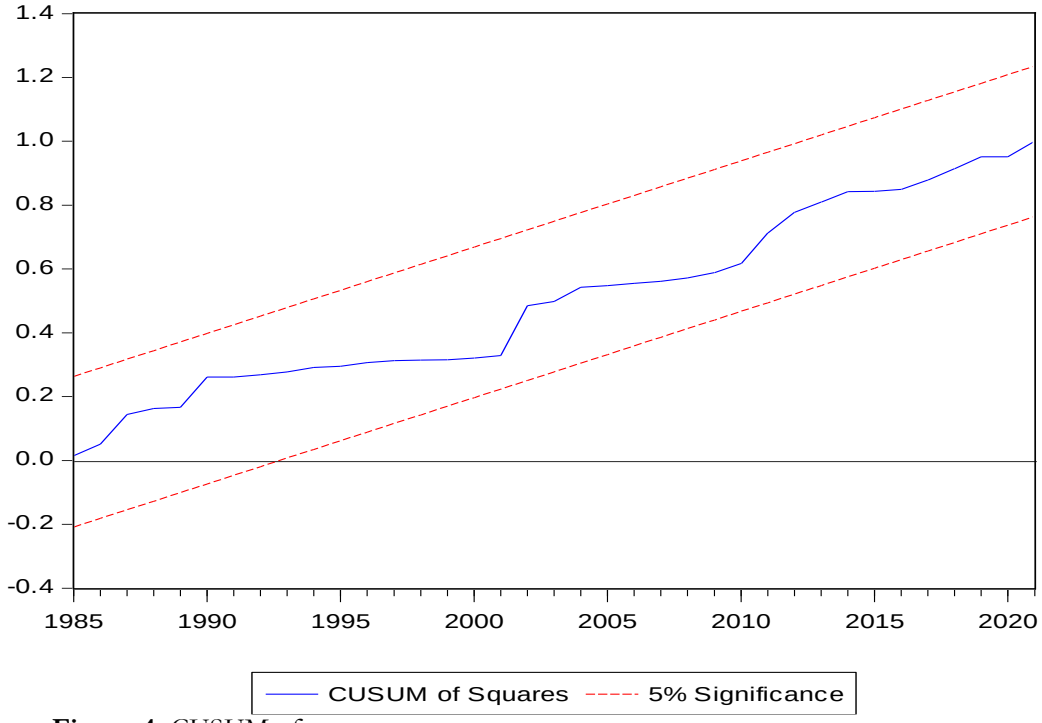

Figure 4. CUSUM of squares.
Source: E-Views 9, 2024.

5. Discussion

The study employed the OLS estimation model to analyze the relationship between government health expenditures and economic growth. Prior to estimation, each variable was tested for stationarity, with results confirming that all variables were stationary at the first difference level. This ensured the reliability of the results by minimizing potential issues with non-stationary data, which could otherwise lead to biased or inconsistent estimates. The model's intercept was found to be 0.054815, indicating a baseline level for economic growth independent of government health expenditure variables.

Findings from the estimation reveal that government capital health expenditure has an estimated coefficient of 0.008842, aligning with the a-priori expectation of a positive relationship with economic growth. In contrast, government recurrent health expenditure has an estimated coefficient of -0.006081, indicating an inverse relationship with economic growth, which deviates from the expected positive association. These results suggest that while capital health expenditure boosts economic growth, recurrent health expenditure may impede it. Specifically, the findings imply that a 1% increase in government capital health expenditure would lead to a 0.88% rise in GDP growth, highlighting the productive role of investments in health infrastructure and other long-term assets. Conversely, a 1% rise in recurrent health expenditure would decrease GDP growth by 0.61%, potentially due to

inefficiencies or diminishing returns associated with regular operational costs.

The research underscores the differential impacts of capital and recurrent health spending on economic growth. Government capital health expenditure has been shown to positively contribute to real GDP growth by supporting sustainable health services and infrastructure. However, recurrent health expenditure, which covers routine costs, appears to have a negative effect, possibly reflecting inefficiencies or resource misallocations in the health sector's day-to-day spending. These findings suggest that prioritizing capital investments in health can drive economic growth, while careful management of recurrent expenditures is needed to avoid adverse economic effects.

The OLS estimation outcome provides insights into the model's structure and explanatory power for economic growth in relation to health expenditures. The intercept (α_0) is 0.054815, representing the baseline level of economic growth when all independent variables are held constant. The model's R-squared (R^2) value is 0.011928, which suggests that only 1.19% of the variance in economic growth is explained by government health expenditures. This relatively low R-squared value indicates that other factors, beyond health spending, significantly influence economic growth in Nigeria. Nevertheless, the p-value of 0.0800913 implies that the model as a whole has some level of statistical relevance, though not at a conventional significance level.

Examining the coefficients, a unit increase in government recurrent health expenditure corresponds to a decrease of approximately 0.6% in economic growth, highlighting an inverse relationship between recurrent spending and growth. However, with a p-value of 0.6295, this relationship is not statistically significant, suggesting that recurrent health spending's negative effect on growth may not be robust. In contrast, a unit increase in government capital health expenditure results in a 0.8% increase in economic growth, aligning with expectations that investment in health infrastructure fosters economic growth. Yet, the p-value of 0.59991 indicates this positive relationship is also statistically insignificant. These findings suggest that while capital health expenditure has a favorable effect on growth, neither expenditure type is a strong predictor of economic growth in this model, signaling the need for further research to identify other determinants.

6. Conclusions

This study aims to evaluate the impact of government health spending on economic growth in Nigeria between 1992 and 2021. The OLS model was used to perform the estimation after the variables determined to be stationary at first differences were evaluated for stationarity. According to the model's estimated results, neither of the independent variables government capital or recurrent health spending has a discernible impact on Nigeria's economic expansion. The independent variables were not significantly significant, this could be attributed to the lack of strength of indirect effects and the time lag between ongoing healthcare costs and the overall economy. Additionally, in Nigeria, poor machine quality, unfinished projects, and corrupt officials might be blamed for health expenditures, which decreased the standard of healthcare and general wellness.

The study recommended that; The government should put in place the facilities needed for people to use healthcare and to maximize wellbeing to improve health outcomes, it has been determined that recurring expenses significantly impede Nigeria's economic expansion. As a result, this highlights the necessity for the government to enhance recurring spending patterns by emphasizing human development through an appropriate expenditure-switching strategy, since capital health spending has a positive correlation with economic growth, budgetary allocation for capital health spending needs to be increased to ensure that essentials are available and that access to health services is growing. Only then will capital health spending have a statistically significant impact on economic output and the government should conduct a study of the healthcare industry, paying particular attention to the medical staff. Assessing the staff's abilities, fit for the demands of the health sector, attitude, and productivity should be given priority. Additionally, hospitals should have access to additional health-related machinery and technology to expand the availability of health services, which will have a positive impact on economic productivity.

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