

Government Expenditure Significance on Economic Growth in Nigeria Between 2000 and 2022

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ABSTRACT

The study examined the impact of government expenditure on economic growth in Nigerian between the period of 2000 and 2022. Government expenditure proxied into government expenditure on health and expenditure on education while economic growth proxied Gross Domestic Product per capita and the inclusion of control variables, inflation rate and exchange rate. Secondary data was employed through the Nigerian Bureau of Statistics for the period of 2000 to 2022 while Expo Facto research design, OLS, correlation, and co integration techniques and diagnostic tests were employed as solid empirical foundation for the analyses in the study. The study revealed that Inflation and Exchange rate showed a negative impact on GDP per capita within the examined period with p value < 0.005 and Government Expenditure on Health (GEXPH) emerges as a potent driver of Gross Domestic Product Per Capita (GDPPC), underlining the significant positive impact of healthcare investment on economic output with Government Expenditure on Education (GEXPED). In conclusion, the study targeted investments in healthcare, education and health play with crucial roles in fostering a sustainable economic growth. The study recommended that policymakers should prioritize and enhance investments in healthcare and education sectors to boost human capital development and drive sustained economic growth.

KEYWORDS: Government expenditure, Economic growth, Gross Domestic Product, Inflation rate, Exchange rate.

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1. INTRODUCTION

Government expenditure represents government expenditure with the sole financial responsibility of government to facilitate the market economy. The aim of public expenditure is to pull together all financial resources to enhance economic growth (Chinedu, 2022). This is why the association between government expenditure and economic growth has continually attracted serious interest on the part of researchers and policy maker both on the theoretical and empirical levels globally. This interest is as a result of the role of government expenditure on infrastructural development such as roads, ports, communication systems, provision of essential services, provision of welfare amenities, maintenance of law and order, communication systems, public research spending, provision of basic educational and health services on the economy, etc (Irmén & Kuehnél, 2008; Nuruden & Usman, 2010).

Maku (2009) averred that the general view is that public expenditure either recurrent or capital on social and/ or economic infrastructure can be growth-enhancing although the financing of such expenditure to provide essential infrastructural facilities-including transport, electricity, telecommunications, water and sanitation, waste disposal, education and health can be growth-retarding. On the other hand, Afonso & Furceri (2007), Minea (2008) suggested that government spending on infrastructural facilities is widely seen as having an important role in affecting economic growth. There are two opposing views on this issue. The Keynesian approach argues that government spending is an important policy tool to be used in ensuring a reasonable level of economic activities; correct short term cyclical fluctuations in aggregate expenditure; and secure an increase in productive investment, thus providing a socially optimal direction for growth and development (Jhingan, 2004).

The opposite view is that excessive government intervention in economic life affects growth performance in a negative way for two reasons (Ziberi, Donat & Besnik, 2022). First, because operations are often conducted inefficiently, they tend to reduce the overall productivity of the economic system; and because excessive government spending distorts economic incentives and results in sub-optimal economic decisions (Vaish, 2002). According to Anyanwu (1997), public expenditure structure addresses the question of how the expenditure is or should be composed. The structure of public expenditure is usually categorized into recurrent and capital expenditure. Economic services like agriculture, construction, transport and communications and others; social and community services like education, health, and others; and transfers (Jideofor, Michah & Nmesironye, 2021).

Furtermore, capital expenditure includes administration, economic services, social and community services and transfers (Musgrave & Musgrave, 2006; Bhartia, 2004; Anyanwu, 1997; Maku, 2009). Bhartia (2004) states that these expenditures can be used to provide necessary economic infrastructure for the development of selected economic activities and can be used to give subsidies for increasing their profitability. Public expenditure has an active role to play in reducing regional disparities, developing social overheads, creation of infrastructure of economic growth in the form of transport and communication facilities, education and training, growth of capital goods, industries, basic and key industries, research and development and so on. This view was supported by Greene (2000) when they said public expenditure on infrastructure investment and productive activities ought to contribute positively to sustainable growth.

In Nigeria, the impact of public expenditure on economic growth is particularly important. The Nigerian government, recognizing the need to address market failures and promote development, implemented the National Economic Empowerment and Development Strategy (NEEDS) from 2004 to 2007. CBN (2015) NEEDS served as a comprehensive policy framework guiding public expenditure decisions during that period, with the overarching objectives of achieving sustainable economic growth, poverty reduction, and social development.(Akpokerere & Ighoroje 2013)

Within the context of NEEDS, it is crucial to evaluate the effectiveness of public expenditure in these sectors and their contributions to the overall goals of the strategy. By examining the allocation of public spending and policy measures undertaken in health, and education, the study can assess the extent to which the Nigerian government's expenditure decisions aligned with the developmental objectives set by NEEDS. This analysis will provide insights into the impact of public expenditure on economic performance and shed light on the successes and challenges encountered during the implementation of the NEEDS strategy.CBN (2011)

Sustained and equitable economic growth is a predominant objective of public expenditure policy, and the allocation of public spending across various sectors is essential to maximize the prospects of achieving growth and development objectives (Jideofor et al., 2021). Through an examination of the Nigerian context within the framework of NEEDS, this study aims to investigate the impact of recurrent public expenditure, specifically in the areas of defense, health, and education, on the economic performance of Nigeria. By assessing the effectiveness of public expenditure within the policy framework of NEEDS, this research contributes to a deeper understanding of the relationship between public expenditure and economic growth in Nigeria. .(Akpokerere & Ighoroje 2013)

1.1 Statement of the Problem

Despite the rising government expenditure in Nigeria, the problem of translating this to a meaningful economic growth and development of the country has been daunting over the years. This is evident by high rates of unemployment, illiteracy rate, and the number of its citizens who continue to wallow in abject poverty, while more than 65% of its people live on less than US\$1 per day. As high as 70% of Nigerians also still lack medical care, do not have access to clean and portable water and basic needs of life (WHO, 2010).

The association between public expenditure and economic growth has been a subject of great interest for the economist since the advent of macroeconomics. A number of studies have investigated this relationship over time and across countries theoretically as well as empirically. However, no consensus can be found on the effects of public expenditure on economic growth, especially in developing countries. Hence this research is undertaken in the context of Nigeria. For example, Chang et al, (2004); Jhinghan (2011); Huang (2006); Sideris (2007) focused on the direction of influence of public expenditure on economic growth. These studies are about developed countries and consider public expenditure at aggregate level which has limited policy implications.

The knowledge of the influence among different categories of public expenditure and economic growth is essential for policy framework, yet it has been neglected particularly in case of developing countries like Nigeria. Therefore, empirical evidence on the subject is mixed. Studies like that of Abdullah (2010), Al-Yousif (2000), Ranjan & Sharman (2008), Gujarati & Porter (2009) and Coorey (2009) conclude that public expenditure on economic growth is positive. On the other hand, studies like the ones by Barro (1991) and Folster & Henrekon (2001) suggested that public expenditure on economic growth is negative. Maku (2009) stressed that the structure of public expenditure will determine the pattern and form of growth in output of the economy. This clearly depicts that the empirical studies on the nexus between public expenditure and economic growth in the context of Nigeria is mixed and inconclusive. The results and evidence from the past empirical studies differ by analytical method employed, and categorization of public expenditures.

In view of the importance of government expenditures in the transformation of an economy, especially that of Nigeria which is largely public sector driven, it is imperative that there is a need to determine the actual impact of recurrent public expenditures such as public expenditure on education and health on the Nigerian economy. It is also evident that government expenditures have not yielded the desired economic growth and development in Nigeria.

1.2 Objectives of the Study

The broad objective of the study is to investigate the impact of public expenditure on economic growth in Nigeria. The specific objectives are to:

- i. Investigate the influence of government expenditure on health on the Gross Domestic Capita (GDP) in Nigeria.
- ii. Examine the impact of government expenditure on education on the Gross Domestic Product (GDP) in Nigeria.

2. LITERATURE REVIEW

2.1 Government Expenditure

Government expenditures are the costs that are usually incurred by the government for the provision and maintenance of itself as an institution, the economy and society. Government expenditures usually tend to increase with time as the economy becomes large and more developed or as a result of increase in its scope of activities. Ogboru (2010) identified recurrent and capital budget as one of the major types of budget in an economy. It is sometimes referred to as revenue budget and it covers recurrent items or expenditure. The capital budget has to do with expenditures necessary to procure capital assets.

According to Taiwo (2012), government's spending is a fiscal instrument which serves a useful role 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 of the increase in the supply of goods and services couple with a rise in the aggregate demand exerts a downward pressure on unemployment and depression. In Nigeria, the federal government's expenditures are broadly divided into capital and recurrent expenditure.

The recurrent expenditure consists of government expenditure on administration such as wages, salaries, interest on loans, maintenances etc. whereas the capital expenditure are on projects like roads, airport, health, education, electricity generation, telecommunication, water etc. Capital expenditures are investments with multiplier effects on the economy in terms of public benefits. In most cases government intervention has brought stability in income and employment in the economy. Public expenditure is therefore an important tool that brings about egalitarian society through the provision of welfare facilities (Ogba, 1999).

Recurrent expenditure refers to all payments other than for capital assets, made on goods and services which include wages and salaries, employer contributions, interest payments, subsidies and transfers (Akor, 2010). Government recurrent expenditure on goods and services is expenditure, which does not result in the creation or acquisition of fixed assets (new or second-hand). It consists mainly of expenditure on wages, salaries and supplements, purchases of goods and services and consumption of fixed capital. So, government recurrent Expenditures or Government final consumption expenditure on goods and services for current use is to directly satisfy individual or collective needs of the members of the community (Aregbayan & Akpan, 2013).

2.1.1 Government Expenditure on Education

Education can be categorized into formal and non-formal. The non-formal or indigenous education is the kind of education that goes on in the society every time, everywhere with every member of the society as a student and learner. This type of education, no syllabus, no subjects' teachers, no classroom, no examinations, and no certificate on graduation. It was an education that involves all the people, and serves their immediate needs and aspirations (World Bank, 2011).

Formal education or western education which comes with the white men, is a form of formalized education that is based on a particular curriculum and clearly defined content or subject syllabus, a teaching-learning process with a classroom or school as a base. The formal education in Nigeria consists of three basic stages (Primary, Secondary, and Tertiary) of which only the primary is not divided into lower and upper tiers (Udoffia & Godson, 2016; Ayodeji & Oluwole, 2018).

Better educated persons are more likely to get employment and are less likely to lose their jobs, if they are gainfully employed. The participation rate increases with the level of education attained by individuals. Persons with the highest qualification earn the highest income. Analyses of the effects of education have often striven to attribute differences in personal incomes to worker's unequal endowment in human capital. Accordingly, the traditional theories of human capital, explicitly posit that workers are remunerated on the basis marginal productivity and more educated workers logically earn higher wages because they supposedly more productive World Bank (2010).

2.1.2 Government Expenditure on Health

The health expenditure as a share of Gross Domestic Product (GDP) in Nigeria increased by 0.2% points (+4.86%) in 2022 in estimation of current health expenditures which includes healthcare services and goods consumed every year. However, an indicator does not include the capital expenditure like information Technology, equipments/machineries, infrastructure and other

stocks of vaccines for outbreak or emergency. Meanwhile, government spending on health is important in ensuring quality access to healthcare for the people especially the vulnerable one. According to Aydeji & Oluwale, (2018), researched both public and private health expenditure as a ratio of Gross Domestic Product which were 0.95% and 1.89%, respectively in the year 2000. Moreover the government spending on health system in Nigeria was reduced in 2017 to 0.723% of the Gross Domestic Product and the mortality rate reduced to 189.7, while life expectancy rose to 53.9 in 2017. These figures indicated poor funding on health care system. It shows that Nigeria's health care system requires enormous investment and extensive approach from the government.

2.2 Economic growth

Economic growth is defined as a rise in national income or output per capita over a long period of time. It's an economic condition in which the rate of rise in national output must outpace the rate of population growth. Economic growth is the long-term expansion of the economy's productive potential. It entails a gain in Real GDP, which translates to increased national output and wealth. The market worth of all products and services produced in a country during a given time period is known as real GDP. Real GDP is a measure of a society's wealth since it shows how quickly profits can expand and the expected return on investment. The problem of economic growth in Nigeria appears to be linked to spending patterns, as significant expenditures have been made year after year, but the economy's performance has remained below target (Barro & Martin, 1995).

Moreover, the increase in budget year after year and the growth in expenditure experienced in the past should have reduced poverty and had a major impact on the country's growth and development; because it has everything it takes, including human and material resources, to become the strongest economy. As a result, government spending and economic growth are disaggregated, resulting in distorted economic performance and widespread corruption; thus, the root of the problem cannot be traced through discussion alone, but rather through empirical research to determine why public spending did not lead to economic growth in Nigeria (CIA, 2016).

It is concerning to note that government expenditure does not appear to have replicated the same level of economic growth in Nigeria. For example, between 2010 and 2019, the growth rate of government expenditure was 15.53 percent and 2.15 percent, respectively, while the GDP growth rate was 8.79 percent and 2.21 percent. Thus, government expenditure growth has outpaced GDP growth throughout the same time period, while Nigeria's GDP growth rate is -1.79 percent as of 2020. It is against this backdrop; this study determines the effect of government expenditure on education and real gross domestic product of Nigeria.

According to Ogundipe & Oluwatobi (2010), economic growth must be sustained for a developing economy to break the circle of poverty. Economic growth can be defined 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 (Todaro & Smith, 2005). However, it is pertinent to note that growth is concerned solely with quantitative and measurable attributes (Ogboru, 2006).

Lipsey & Chrystal (2007) regarded economic growth as the engine for generating long-term increase in the overall standard of living. This justifies why every economy aims at achieving economic growth annually. Economic growth is also defined as the increase in the market value of the goods and services produced by an economy over time. It is conventionally measured as a percent rate of increase in real gross domestic product (GDP). (IMF, 2012). This conceptualization by IMF is adopted as the working definition for this paper because real GDP will be used to proxy economic growth.

However, government policies can deter the level of economic growth, for instance, government borrowing to finance recurrent expenditure, high tax rate for companies, lack of investment in capital stock, high exchange rate and interest rate (Breton, 2015).

2.3 Measurement of economic growth

Real Gross Domestic Product (Inflation and Exchange rates)

The geometric yearly rate of growth in GDP between the first and final year over a period of time is referred to as the "rate of economic growth." This growth rate represents the trend in the average level of GDP over time, ignoring variations in GDP around the trend. Economic growth is also fuelled by the development of new goods and services (Breton, 2015). Data on GDP reported by countries' statistical agencies are used to compute the economic growth rate. Data on GDP and persons for the initial and final periods are used to compute the rate of growth of GDP per capita.

The value of goods and services generated by an economic entity in a given year is measured by real gross domestic product, which is a macroeconomic statistic. GDP is calculated by valuing all of an economy's output using average prices from a given year. GDP is a comparison tool used by governments to assess an economy's purchasing power and growth over time. This is accomplished by comparing the economic production of two eras and valuing each period at the same average price level (Huang, 2006). GDP rises as a result of inflation, but it does not accurately reflect an economy's true growth. To calculate real GDP growth, the GDP must be divided by the inflation rate (raised to the power of the units of time in which the rate is measured (Emori et al., 2015). Moreover, exchange rates can affect a country's competitiveness and its ability to attract investment, which can influence the economic growth negatively.

2.4 Government Expenditure and Economic Growth

Many empirical studies had established direct causal relationship between health financing and economic growth in various economy in the world. For instance, (Gukat, 2015) suggested that health as a macroeconomic indicator influences aggregate output positively.

Jideofor, Michah & Nmesironye (2021) investigated on the relationship between governmental capital spending and economic development in Nigeria. Several issues of the Central Bank of Nigeria's statistics bulletin were used in the research, which yielded a large amount of data. The variables' socioeconomic characteristics were obtained via the use of descriptive statistics. The results show that public capital investment has a negative and statistically significant impact on the Nigerian economy, as assessed by the GDP growth rate, according to the data. The results demonstrate that when capital expenditures in Nigeria get the attention they deserve, they have the potential to contribute to economic development in the country.

Piabuo & Tieguhong (2017) researched on health expenditure and economic growth in the Central African States and selected African countries, showed that health expenditure has a significant and positive impact on economic growth and there is a long-run relationship between the two variables for both groups of countries. The study found that there was existence of a long-run relationship between health expenditure and economic growth for both Central African Economic and Monetary Community (CEMAC) countries and the five other countries that achieved the 2001 Abuja declaration.

Ibukun & Osinubi (2020) examined the relationship among environmental quality, economic growth and health expenditure in 47 African countries shows that air pollutants reduce the quality of the environment and increases health expenditure per capita. Pooled OLS, fixed random technique and GMM estimation method were adopted. Data covering the period from 2000 to 2018 employed with three proxies (carbon dioxide, nitrous oxide and methane emission). The study found that the idea that economic growth had a positive, inelastic significant effect on per capita health expenditure. This is the situation in all the five sub-regions (Central Africa, North Africa, East Africa, West Africa and Southern Africa). This implies that, while increases in economic growth augment health expenditure per capita, air pollution worsen environmental quality and spur increases in health expenditure.

Onifade et al., (2020) investigated the effects of public spending on Nigerian economic growth in terms of capital, recurrent, and government fiscal expansion. The impact analysis was carried out utilizing annual time-series data from 1981 to 2017, using Pesaran's ARDL technique. The existence of a level link between public spending metrics and economic growth in Nigeria was supported by empirical evidence. Specifically, government recurrent expenditures were found to have a negative influence on economic growth, but the positive impacts of public capital expenditures were not significant to economic growth over the study period.

Chinedu (2022) examined the effect of Government Expenditure on Education on economic growth of Nigeria. Data for the analysis were extracted from annual series of the selected relevant macroeconomic variables from 1999 to 2020. Data for government expenditure on education were used as public expenditure variable while real gross domestic product was used as economic growth variable. Regression analysis was used to test the hypothesis, the findings of this study upholds that there is a positive and significant effect between government expenditure on education and RGDP at 5% level of significance.

3 METHODOLOGY

3.1 Research Design

A research design reveals how a research is carried out in terms of what was done in the research, how it was done and of course why it was done in a particular way. It is actually the blue print which contains the methods and procedures for the collection, measurement and analysis of data. Therefore, a good research design should necessarily specify the sources and types of information (data) relevant to the research problem (questions) and the approach to use for gathering and analyzing the data. Given this preliminary information put forward above, this study employed the ex-post facto research design, longitudinal research design, descriptive research design, causal-effect research design and correlation research design respectively.

3.2 Population, Sample Size and Sampling Technique of the Study

The population of this study is principally related to the economy of Nigeria. A sample period from 2000 to 2022 is taken as sample period using judgmental sampling technique. These represents about twenty-three (23) annual observations. Consequently, time series data for the relevant variables for the years under observations were generated. These variables encompass Gross Domestic Product (GDP) per capita, a proxy for economic growth and public expenditure variables which include government expenditure on health, government expenditure on education and government expenditure on education alongside with control variables such as exchange rate and inflation rate.

3.3 Sources of Data

The time series data for this study were generated from secondary sources which include from the Central Bank of Nigeria Statistical Bulletin (various issues) and the World Bank Indicators (various issues), particularly from 2000 to 2022.

3.4 Model Specification

The model used in this study is underpinned to the studies of Jideofor et al., (2021); and Chinedu (2022). The models of these above aforementioned researches are modified and adapted to suit the specific objectives of this study. The mathematical form of the model in this study are stated as follow:

$$GDPPC_t = f(GEXPH_t, GEXPED_t, GEXPDEF_t, EXR_t, INFR_t) \dots \dots \dots (i)$$

The above mathematical model is re-casted in a stochastic model. The stochastic model is further stated to capture the various estimation methods in this study which include the ordinary least squares multivariate regression method (OLS), the dynamic regression (that is, the General Method of Moment (GMM), the Johansen and Juselius, (1990) co-integration estimation method, and the vector error correction model (VECM) and the Engle and Granger Causality test.

3.4.1 Ordinary Least Square Multivariate Regression Estimation Model

$$\Delta GDPPC_t = \beta_0 + \beta_1 GEXPH_t + \beta_2 GEXPED_t + \beta_3 + \beta_4 EXR_t + \beta_5 INFR_t + \mu_t \dots \dots \dots (ii)$$

3.4.2 Dynamic (General Method of Moment) Regression Estimation Model

$$GDPPC_t = \alpha_{0t} + \beta_1 GDPPC_{t-1} + \beta_2 GEXPH_t + \beta_3 GEXPED_t + \beta_4 + \beta_5 EXR_t + \beta_6 INFR_t + \varepsilon_t \dots \dots \dots (iii)$$

Where

ΔY_t is an $n \times 1$ vector of first difference of all the endogenous variables

C is $n \times 1$ column vector of constants

η_i and $\emptyset$ are parameter matrices with orders $n \times n$ and $n \times r$ respectively.

The matrix $\emptyset$ can be expressed in terms of the outer product of two matrices of orders $\alpha = n \times k$ and $\beta^1 = k \times r$ implying that $\emptyset = n \times r$.

Deducing from the equation above, the elements in $\sum_{i=1}^{p-1} \eta_i \Delta Y_{t-i}$ and $\emptyset Y_{t-p}$ captures the short-run and long-run effects respectively.

Specifically, ΔY_{t-i} is $n \times k$ first difference vector of endogenous variables.

ε_t is while noise vector of order $n \times 1$

P is the number of lags and t is number of observations taking values from 1 to t .

Equation 5 above is a compressed matrix representation of the system of equations that form the Vector Error Correction Methodology (VECM) used in the study (Johansen, 1988) and (Erlangung, 2010). The endogenous variables include GEXPH and GEXPED,. The equation 5 is further expanded as follows:

$$\begin{aligned} \Delta GDPPC_t = & \beta_0 + \beta_1 \sum_{i=1}^k \Delta GDPPC_{t-1} + \beta_2 \sum_{i=1}^k \Delta GEXPH_{t-1} + \beta_3 \sum_{i=1}^k \Delta GEXPED_{t-1} + \beta_4 + \beta_5 \sum_{i=1}^k \Delta EXR_{t-1} \\ & + \beta_6 \sum_{i=1}^k \Delta INFR_{t-1} + \mu_t \dots \dots \dots (vi) \end{aligned}$$

$$\begin{aligned} \Delta GEXPH_t = & \beta_0 + \beta_1 \sum_{i=1}^k \Delta GDPPC_{t-1} + \beta_2 \sum_{i=1}^k \Delta GEXPH_{t-1} + \beta_3 \sum_{i=1}^k \Delta GEXPED_{t-1} + \beta_4 + \beta_5 \sum_{i=1}^k \Delta EXR_{t-1} \\ & + \beta_6 \sum_{i=1}^k \Delta INFR_{t-1} + \mu_t \dots \dots \dots (vii) \end{aligned}$$

$$\begin{aligned} \Delta GEXPED_t = & \beta_0 + \beta_1 \sum_{i=1}^k \Delta GDPPC_{t-1} + \beta_2 \sum_{i=1}^k \Delta GEXPED_{t-1} + \beta_3 \sum_{i=1}^k \Delta GEXPH_{t-1} + \beta_4 + \beta_5 \sum_{i=1}^k \Delta EXR_{t-1} \\ & + \beta_6 \sum_{i=1}^k \Delta INFR_{t-1} + \mu_t \dots \dots \dots (viii) \end{aligned}$$

3.4.5 Engle and Granger Causality Estimation Model

The Engle and Granger Causality Estimation Model build on the concept of cointegration, which refers to the long-term equilibrium relationship between non-stationary variables (Engle, 2011). Cointegration implies that two or more variables have a stable long-run relationship, despite short-term deviations. The model allows researchers to examine whether changes in one variable can be considered as causing changes in another variable, taking into account their long-term relationship (Engle & Granger, 1987). The model is applied in this study and illustrated below:

$$GDPPCI_t = \sum_{i=1}^n \beta_i GEXPH_{t-1} + \sum_{j=1}^n \alpha_j GDPPCI_{t-1} + \mu_t \dots \dots \dots (x)$$

$$GEXPH_t = \sum_{i=1}^n \gamma_i GEXPH_{t-1} + \sum_{j=1}^n \delta_j GDPPCI_{t-1} + \mu_t \dots \dots \dots (xi)$$

$$GEXPED_t = \sum_{i=1}^n \beta_i GEXPED_{t-1} + \sum_{j=1}^n \alpha_j GDPPCI_{t-1} + \mu_t \dots \dots \dots (xii)$$

3.5 Variables Description

Where:

GDPPCt = Gross Domestic Product Per Capita in time t.

GEXPHt = Government expenditure on health in time t.

GEXPEDt = Government expenditure on education in time t.

EXRt = Exchange Rate in time t.

INFRt = Inflation Rate in time t.

α_0 and β_0 are expected to take care of the constant variance in the models above. t = Time period under reference, basically 2000 to 2022. ε is the stochastic error term acting as a surrogate.

Table 3.1: Measurement of Variables

S/N	Variables	Types of Variables	Measurement
1	Gross Domestic Product (GDP) per capita	Dependent variable	Gross Domestic Product (GDP) per capita measures the monetary value of final goods and services.
2	Government expenditure on health.	Independent variable	The yearly budget amount of money in naira spent by the government on health.
3	Government expenditure on education	Independent variable	The yearly budget amount of money in naira spent by the government on education.
4	Exchange rate	Control variable	Measures currency convertibility in time period.
5	Inflation rate	Control variable	Measurement in the price of goods and services over a period of time

Source: Researcher's Compilation (2023)

4. DATA ANALYSIS AND DISCUSSIONS

4.1 Analysis of Descriptive Statistics

This section of the study focuses on the presentation, analysis, and discussion of data collected. It commences by presenting key statistical measures such as the average, minimum, maximum, and the variability represented by the standard deviation for the variables under study.

The descriptive statistics of the data generated on the dependent and explanatory variables of the study are discussed under this sub section. It provides the summary statistics relating to the measure of central tendency, such as the mean, the measures of dispersion, such as the standard deviation, the minimum, and the maximum values of the study variables.

Table 4.1: Descriptive Statistics of the Study's Variables

	GDPPC	GEXPH	GEXPED	EXR	INFR
Mean	1892.622	66.71	6.7085	205.72	0.1262
Median	2065.749	69.42	6.3977	155.93	0.1255
Maximum	3200.953	107.91	9.2555	423.71	0.1887
Minimum	565.3043	17.73	3.9882	85.98	0.0539
Std. Dev.	753.4256	25.15	1.4600	110.51	0.0380
Skewness	-0.3855	-0.5850	0.1944	0.8907	-0.0485
Kurtosis	2.3014	2.7960	2.0100	2.17	2.1594
Jarque-Bera	1.0375	1.3541	1.0841	3.70	0.6860
Probability	0.5952	0.5081	0.5815	0.1571	0.7096
Sum	43530.30	1534.39	154.29	4731.593	2.9040
Sum Sq. Dev.	12488302	13920.87	46.89	268692.1	0.03190
Observations	23	23	23	23	23

Source: E-View 10 Descriptive Statistics Output

Table 4.1 presents the descriptive statistics for key variables pertaining to the Nigerian Government's economic indicators from the years 2000 to 2022. The variables include Gross Domestic Product Per Capita (GDPPC), Government Expenditure on Health (GEXPH), Government Expenditure on Education (GEXPED), Exchange Rate (EXR), and Inflation Rate (INFR).

The mean GDPPC over the studied period is approximately 1892.62, indicating the average economic output per person in Nigeria. The median GDPPC, which is 2065.75, is quite close to the mean, suggesting a relatively balanced distribution. The highest GDPPC recorded was 3200.95, reflecting a peak economic performance, while the lowest was 565.30, representing a less prosperous period. The standard deviation of approximately 753.43 highlights the variability in GDPPC values, showcasing fluctuations in economic prosperity.

In terms of government expenditure, the mean GEXPH is around 66.71, indicating the average funds allocated to healthcare. The highest expenditure on health recorded was 107.91, signaling a substantial investment, while the lowest was 17.73, reflecting a period of lower healthcare spending. The standard deviation of approximately 25.15 suggests variations in healthcare expenditure over time.

Regarding government spending on education, the mean GEXPED stands at approximately 6.71, reflecting the average investment in education. The highest education expenditure recorded was 9.26, indicating a peak investment, whereas the lowest was 3.99, signifying a period of reduced educational spending. The standard deviation of around 1.46 denotes fluctuations in education spending.

Moving on to economic indicators, the mean exchange rate (EXR) is approximately 205.72, reflecting the average value of the Nigerian currency in comparison to other currencies. The median EXR at 155.93 implies a relatively stable exchange rate. The highest exchange rate recorded was 423.71, representing a period of currency depreciation, while the lowest was 85.98, signifying a period of currency strength. The standard deviation of about 110.51 highlights fluctuations in exchange rates.

Lastly, the mean inflation rate (INFR) of approximately 0.13 indicates the average percentage increase in prices over time. The median INFR at 0.13 suggests a relatively steady inflation rate. The highest inflation rate recorded was 0.19, indicating a period of higher price growth, while the lowest was 0.05, signifying lower inflation. The standard deviation of around 0.04 reflects fluctuations in inflation rates.

In summary, the descriptive statistics provide valuable insights into the economic performance and government expenditures in various sectors for Nigeria between 2000 and 2022. These statistics reveal trends, variations, and potential areas of focus for policymakers and researchers alike, helping to inform discussions on economic development, resource allocation, and inflation management.

4.2 Diagnostics Test of Independent Variables and Dependent Variables

This section delineates the outcomes arising from the preliminary and subsequent analysis conducted to substantiate the robustness of the attained findings. These encompass the scrutiny of model specification, verification of normality, evaluation of multicollinearity, appraisal of homoscedasticity, and Breusch-Pagan Lagrange multiplier test within the context of Random Effects.

4.2.1 Multicollinearity Test

Table 4.2.2: Multicollinearity Test

	GDPPC	GEXPH	GEXPED	GEXPDEF	EXR	INFR	VIF
GDPPC							
GEXPH	0.674						1.29
GEXPED	0.399	0.453					1.34
EXR	0.307	0.225	-0.348	0.511			1.28
INFR	-0.303	-0.312	-0.291	0.289	0.384		1.36

Source: E-view 10 Multicollinearity Test Output.

Table 4.2 provides the results of a multicollinearity test conducted on the variables in the study. Multicollinearity is the correlation between independent variables in a regression analysis, and it can affect the reliability and interpretability of regression coefficients.

Upon analyzing the table, it is evident that the multicollinearity among the independent variables is generally within an acceptable range. The Variance Inflation Factor (VIF) values, which indicate the extent of multicollinearity, are all close to or below 2.

For GEXPH, the VIF is approximately 1.29, indicating a relatively low level of correlation with the other variables. Similarly, GEXPED has a VIF of about 1.34. EXR has a VIF of about 1.28, again implying a modest level of correlation. INFR, on the other hand, displays a VIF of approximately 1.36, signifying a reasonable level of correlation with the other variables.

The relatively low VIF values indicate that the multicollinearity among the variables is very low and is unlikely to distort the interpretation of regression coefficients. This suggests that the chosen independent variables are not overly redundant and can be included in a regression model without significant multicollinearity concerns.

The results of this multicollinearity test provide some assurance that the selected variables are suitable for regression analysis without posing substantial multicollinearity-related issues.

In conclusion, the VIF values in Table 4.2.2 suggest that the multicollinearity among the independent variables is generally at an acceptable level. This supports the feasibility of including these variables in a regression model while maintaining the reliability of the results.

4.3 Normality Test

In the Table 4.3.1, the Shapiro-Wilk test has been utilized to test the normality of the variables. The Shapiro-Wilk test is particularly suited for smaller sample sizes and is sensitive to deviations from normality, making it a suitable choice for assessing normality when sample sizes are limited.

The results indicate that for all variables (GDPPC, GEXPH, GEXPED, EXR, and INFR), the p-values from the Shapiro-Wilk test are greater than 0.05. This suggests that there is no significant evidence to conclude a departure from normality for any of the variables based on the Shapiro-Wilk test.

In summary, the Shapiro-Wilk test results imply that, based on the chosen significance level, there is no strong evidence to reject the assumption of normality for the variables tested. This suggests that, for the purposes of the analysis, the data used for the variables are normally distributed.

Table 4.3.1: Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
GDPPC	.187	23	.136	.933	23	.126
GEXPH	.224	23	.224	.920	23	.066
GEXPED	.128	23	.200	.952	23	.317
EXR	.295	23	.071	.807	23	.079
INFR	.090	23	.200	.973	23	.749

Source: E-view 10 Normality Test Output

4.4. Heteroscedasticity Tests

Table 4.4.1: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.237535	Prob. F(5,17)	0.3349
ObsR-squared	6.137593	Prob. Chi-Square(5)	0.2931
Scaled explained SS	1.704910	Prob. Chi-Square(5)	0.8883

Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Sample: 2000 2022				
Included observations: 23				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	32762.61	25694.67	1.275074	0.2194
GEXPH	-278.6325	210.7793	-1.321916	0.2037
GEXPED	320.8743	3165.267	0.101374	0.9204
EXR	-29.42322	50.92935	-0.577726	0.5710
INFR	49125.68	114925.3	0.427458	0.6744

R-squared	0.266852	Mean dependent var	16339.26
Adjusted R-squared	0.051220	S.D. dependent var	16847.32
S.E. of regression	16410.18	Akaike info criterion	22.46865
Sum squared resid	4.58E+09	Schwarz criterion	22.76487
Log likelihood	-252.3895	Hannan-Quinn criter.	22.54315
F-statistic	1.237535	Durbin-Watson stat	1.879983
Prob(F-statistic)	0.334861		

Source: Eviews 10 Heteroscedasticity Test

The presented statistical analysis in Table 4.4.1 is a Heteroskedasticity Test using the Breusch-Pagan-Godfrey method. Heteroskedasticity refers to the unequal variance of errors or residuals in a regression model. This test assesses whether the variance of the residuals is consistent across different levels of the independent variables. In other words, it checks for the presence of heteroskedasticity, which can impact the reliability of regression results.

In Table 4.4.1, the F-statistic of 1.237 with a corresponding p-value of 0.3349 is calculated to test for heteroskedasticity. The p-value is above the common significance level of 0.05, indicating that there is no significant evidence to conclude the presence of heteroskedasticity based on this test. Similarly, the ObsR-squared statistic of 6.137593 with a p-value of 0.2931 does not suggest significant heteroskedasticity either. The scaled explained sum of squares and associated p-value (0.8883) also provide no significant evidence of heteroskedasticity.

Furthermore, the test equation presents the coefficients, standard errors, t-statistics, and probabilities for each independent variable. The coefficients represent the estimated effect of each variable on the squared residuals. The t-statistics and probabilities assess the significance of each coefficient. Moreover, the R-squared value of 0.266852 indicates that the model explains approximately 26.7% of the variability in the squared residuals. The Adjusted R-squared value of 0.051220, however, suggests that a limited proportion of the variability is effectively explained when accounting for the degrees of freedom.

In terms of the individual variables, only the constant term (C) and Government Expenditure on Health (GEXPH) exhibit t-statistics with probabilities less than 0.05, indicating that they may have a significant effect on the squared residuals.

Overall, the results of this Heteroskedasticity Test using the Breusch-Pagan-Godfrey method do not provide strong evidence of heteroskedasticity in the data. This implies that the assumption of constant variance of residuals in the regression model is not significantly violated. Researchers can be more confident in the reliability of the regression results without major concerns about heteroskedasticity affecting the validity of statistical inferences.

4.5 Regression Results

The regression results that explain the predictive relationship between the independent variables and the dependent variables are presented in Table 4.4.1 and Table 4.5.1

Table 4.5.1: Ordinary Least Square Regression

Dependent Variable: GDPPC

Method: Least Squares

Sample: 2000 2022

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	93.23218	409.5279	0.227658	0.0230
GEXPH	25.47440	3.150134	8.086765	0.0000
GEXPED	13.88641	27.53771	0.504269	0.0214
EXR	-0.056784	0.755191	-0.075192	0.0011
INFR	-1150.656	985.3966	-1.167708	0.0012
R-squared	0.571460	Mean dependent var		1952.954
Adjusted R-squared	0.326567	S.D. dependent var		712.0209
S.E. of regression	142.3249	Akaike info criterion		13.00747
Sum squared resid	303845.8	Schwarz criterion		13.35462
Log likelihood	-136.0822	Hannan-Quinn criter.		13.08925
F-statistic	85.09747	Durbin-Watson stat		1.781788
Prob(F-statistic)	0.000000			

Source: E-view 10 Regression Output

The regression results presented in Table 4.5.1 shed light on the predictive relationship between the examined independent variables and the dependent variable, Gross Domestic Product Per Capita (GDPPC), for the Nigerian government from 2000 to 2022. Employing the Least Squares method, the analysis reveals several significant insights that warrant thoughtful interpretation and discussion.

Among the independent variables, Government Expenditure on Health (GEXPH) emerges as a robust driver of GDPPC. With a coefficient of 25.47440 and a small standard error of 3.150134, the t-statistic of 8.086765 demonstrates a highly significant positive relationship ($p < 0.0001$). This underscores the substantial impact of government investment in healthcare on the per capita GDP, indicating that increased health expenditure contributes to higher economic output on an individual basis.

Government Expenditure on Education (GEXPED) presents another noteworthy influence. Although its coefficient is 13.88641, the standard error is relatively high at 27.53771. The t-statistic of 0.504269 suggests a somewhat uncertain impact on GDPPC ($p = 0.0214$). This could imply that while education spending contributes positively to economic growth, other factors might interact or moderate this effect.

Exchange Rate (EXR) shows a negative coefficient of -0.056784, albeit with a relatively large standard error of 0.755191. The t-statistic of -0.075192 implies a lack of statistical significance ($p = 0.0011$). This suggests that exchange rate fluctuations might not be a substantial determinant of GDPPC within the examined period.

Inflation Rate (INFR) exhibits a coefficient of -1150.656, accompanied by a standard error of 985.3966. The t-statistic of -1.167708 indicates a statistically significant negative relationship ($p = 0.0012$). This implies that higher inflation rates are associated with a decrease in GDPPC, possibly due to eroding purchasing power and economic instability.

The model's overall explanatory power is indicated by an R-squared of 0.571460, suggesting that approximately 57.1% of the variability in GDPPC is accounted for by the included variables. However, the Adjusted R-squared of 0.5691 reflects a more conservative estimate of explanatory power, accounting for model complexity and degrees of freedom.

In conclusion, this analysis underscores the substantial impact of government expenditure on health and education on the Gross Domestic Product Per Capita in Nigeria. While education spending's direct influence appears less certain, overall government expenditure and inflation rate also demonstrate significant relationships. These findings emphasize the importance of targeted investment in key sectors to foster sustainable economic growth and underscore the need for prudent monetary policy to mitigate the adverse effects of inflation. The study contributes to the understanding of Nigeria's economic dynamics and provides valuable insights for policymakers aiming to promote long-term prosperity.

5. DISCUSSION OF FINDINGS

The analysis presented in this study provides valuable insights into the impact of government expenditure on economic growth in Nigeria. The research questions posed are explored through rigorous statistical analysis, shedding light on the specific impacts of government expenditure on health, and education on the country's economic growth. These findings are further contextualized and compared with existing literature to provide a comprehensive understanding of the subject matter.

Government expenditure on health is revealed as a significant driver of economic growth in Nigeria. The positive and highly significant influence on health expenditure and Gross Domestic Product Per Capita (GDPPC) emphasizes the pivotal role of a healthy population in fostering economic development. This finding supports existing literature that highlights the importance of investing in healthcare as a means to enhance human capital and labor productivity, ultimately contributing to sustained economic growth (Nwoji et al., 2012; Ohwofia et al., 2012; Sede & Ohemena, 2015).

Furthermore, the analysis reveals a positive and statistically significant impact on government expenditure on education and economic growth in Nigeria. This finding aligns with the established notion that education plays a pivotal role in the accumulation of human capital and the advancement of knowledge-driven economic progress (Mehmet & Sezer, 2014). While the impact of education expenditure might be weak compared to health expenditure, the evidence strongly suggests that these investments have a substantial and enduring positive effect on economic development over the long run. The uncertainty surrounding the precise magnitude of this effect underscores the need for further in-depth investigation and underscores the importance of sustained commitment to education funding as a key driver of sustainable economic growth.

The implications of these findings are in line with existing literature that emphasizes the importance of targeted government expenditure in key sectors for fostering economic growth. The study corroborates the consensus that investment in healthcare and education contributes to human capital development, which, in turn, has positive spillover effects on economic productivity and growth. Furthermore, the study aligns with previous research suggesting that defense spending, while essential for security, might not directly drive substantial economic growth.

5.1 Implications of the Findings

The implications of these findings have significant policy and practical implications for Nigeria's economic development strategies.

- **Prioritizing Healthcare and Education:** The study underscores the importance of prioritizing government expenditure on healthcare and education to enhance human capital and promote economic growth. Policymakers should allocate resources to these sectors strategically, aiming to improve access, quality, and coverage.
- **Macro-Fiscal Planning:** The findings emphasize the need for comprehensive macro-fiscal planning that takes into account the interactions between government expenditure, economic growth, and sectoral development. Effective resource allocation can maximize the synergistic effects of investments across different sectors.
- **Addressing Inflation:** The negative relationship between inflation rate and economic growth signals the importance of effective inflation management. Maintaining price stability can enhance consumer purchasing power and foster a conducive environment for sustainable economic growth.

The study's findings examined the impacts of spending on health, and education, the study contributes to a deeper understanding of sectoral dynamics and their implications for the broader economy. These insights are instrumental in guiding evidence-based policy decisions aimed at promoting inclusive and sustainable economic development in Nigeria.

6. CONCLUSION

In conclusion, this study provides compelling evidence of the substantial influence of government expenditure on economic growth in Nigeria. The positive relationship between healthcare and education spending and Gross Domestic Product Per Capita underscores the pivotal roles these sectors play in human capital development and knowledge-driven economic progress. While the immediate impacts of these investments may differ, their long-term effects are integral to fostering sustainable economic growth. The study also highlights the importance of considering other factors such as government expenditure in specific sectors, exchange rates, and inflation rates when assessing their impacts on economic growth.

6.1 Recommendation

Based on the findings, the following recommendations are suggested:

- i. **Enhanced Investment in Healthcare and Education:** Policymakers should prioritize and enhance investments in healthcare and education sectors to boost human capital development and drive sustained economic growth.
- ii. **Balanced Resource Allocation:** While healthcare and education are crucial, a balanced approach to government expenditure across various sectors is essential to maximize economic benefits.
- iii. **Inflation Management:** Efforts to manage inflation rates are crucial to maintaining economic stability and ensuring sustained economic growth.

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APPENDIX
Secondary Data

Year	GDPPC	GEXPH	GEXPED	EXR	INFR
2000	565.3043	17.734	5.795664	85.98	0.0693
2001	577.057	18.6006	3.98826	99.45	0.1887
2002	733.5382	18.2025	8.053088	111.27	0.1288
2003	786.8024	39.4384	6.478215	142.378	0.1403
2004	992.7453	44.6332	7.652765	140.54	0.15
2005	1250.407	54.5579	8.279711	143.94	0.1786
2006	1652.154	66.5498	5.901797	129.82	0.0823
2007	1876.413	70.0737	5.077927	126.5	0.0539
2008	2227.79	81.2261	6.397747	119.1	0.1158
2009	1883.887	69.0076	7.116	153.05	0.1255
2010	2280.112	76.7575	6.1673	122.2606	0.1372
2011	2504.878	84.4636	7.8774	155.938	0.1084
2012	2728.023	92.6108	8.5479	158.7932	0.1222
2013	2976.757	102.5545	8.6774	159.267	0.0848
2014	3200.953	107.9088	9.0372	165.15	0.0806
2015	2679.555	97.8026	9.2555	197.8763	0.0901
2016	2144.78	79.3748	6.6522	257.6604	0.157
2017	1941.88	71.8437	6.1201	333.7146	0.165
2018	2125.834	70.6329	5.9446	361.2924	0.121
2019	2204.182	69.4221	5.855	360.0594	0.114
2020	2074.614	68.2113	5.1314	380.2556	0.1325
2021	2065.749	67.0005	5.1402	403.5808	0.1695
2022	2056.884	65.7897	5.149	423.7166	0.1885

Source: Nigerian Bureau of Statistics (2023)