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GOVERNMENT CAPITAL EXPENDITURE AND ECONOMIC GROWTH: THE NIGERIA EXPERIENCE.

BY

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Abstract: This study has been undertaken to investigate the effect of government capital expenditure on the economic growth in Nigeria. The study used a combination of quantitative analysis and empirical investigation to assess the effects of government capital expenditure on key economic indicators: Gross Domestic Product (GDP), Employment and productivity. Various macroeconomic variables like government expenditure, Investment and infrastructure were considered. They were analysed using Ordinary Least Square (OLS) estimation technique with the aid of E-View version 9. Descriptive Statistics, Unit root and regression were evaluated to provide relevant answers to the research questions. The Study findings revealed that a positive relationship exist between government capital expenditure and economic growth in Nigeria. The Study recommended that increased investments in infrastructure: Roads, Transportation system, Power Plants, and Educational facilities will have significant effect in enhancing productivity, attracting private investment and improving overall economic performance. The study further recommended that undertaking the in the above infrastructures investment will create employment opportunities, stimulate business activities and foster economic development in both urban and rural areas. Policies that prioritise increased investment in infrastructure, backed by sound fiscal management and government prudence will be essential for sustainable economic development.

Index Terms- **Government Expenditure, Economic Growth, Investment, Infrastructure.**

1. Introduction

The fiscal authorities use public expenditure as an important instrument for controlling the economy. Government expenditure plays an important role in the functioning of an economy of underdeveloped, developing and developed economics. Public expenditure can broadly be categorized into recurrent and capital expenditure in Nigeria. Capital expenditure refers to expenses on capital projects like roads, airports, health, education, telecommunication, electricity generation and so on. In a sustainable and equitable economic growth, every government requires a good amount of capital finance through investment expenditures on productive capacity and infrastructural development. These, in the long run, facilitate economic growth in

terms of gross domestic product, which should also translate to economic development which is vigorously pursued by all developing economies (Ofili & Kifordu, 2017).

Economic intervention by the government does not always guarantee stability. It does, however, slow the rate of instability. For instance, government intervention in the economy did not stop the 1970s oil shock, the 2007 financial crisis, the 2016 economic recession in Nigeria, or the 2020 worldwide recession. However, the engagement of the government makes it simple for countries to recover from these shocks. In developing nations with low income, output, and employment, the duties of the government have grown more important (Ugochukwu & Oruta, 2021).

The huge income from the production and sale of crude oil and the rising demand for public (utility) goods like roads, telecommunications, energy, education, and health have led to an increase in government capital spending in Nigeria. Both inside and outside the nation, there is an increasing need for national and personal security. The data that is currently available demonstrates that over the past three decades, total government capital expenditure and its subsets have increased. For instance, the total amount spent on capital projects by the government today increased from 6.57 billion Naira in 1981 to 24.05 billion Naira in 1990, and from 759.28 billion Naira in 2007 to 818.35 billion Naira in 2015. Additionally, according to the CBN report in 2021, government capital expenditure jumped from 653.61 billion Naira in 2016 to 2522.468 in 2021.

The aforementioned context makes it clear that government capital spending for the provision of capital projects in the nation has increased over the years under review. The capital project on the ground was not affected by the increased government capital spending. This research effort was inspired by the alarming situation described above in order to evaluate how and the amount of growth that each of these sectors have attained in light of the significant investments made in them in accordance with economic policies and the overall expansion of the Nigerian economy. Additionally, identify current elements that might have hampered growth despite the regularity of government capital spending.

Because there hasn't been a notable advancement in the construction of capital projects, it appears that the Nigerian government has been wasting money over the years. This is due to the fact that Nigeria still lags behind other countries in the development of capital projects despite having spent a lot of money on them. There is still darkness throughout the region, a terrible road system, and no portable water sources, with significant levels of poverty and unemployment as a result. This is due to the fact that good infrastructure can lead to an increase in businesses and job possibilities, which in turn will lower poverty (Amadi & Alolote, 2020).

In particular, there should be efficient road and educational infrastructure, people should have access to basic healthcare with little hassle, and there should be food security; strangely, this is not the case in Nigeria. The issue is that, contrary to expectations in some countries, the economic development that has been observed has not enhanced welfare (Babatunde, 2015).

This problem is the focus of the study. This is in contrast to the considerable amount of money the Nigerian government spends on public projects, with little indication that the socioeconomic conditions have improved. As a result, this study aimed at pinpoint the contextual elements behind the slow development of capital projects. Studies on government capital expenditure have been done by Duruechi and Chigbu (2022), Enya and Ezeali (2021), Amadi and Alolote (2020), Rafiu (2020), Babatunde (2018), and Ofili and Kifordu (2017). These studies recommended that the efficiency and effectiveness of government capital expenditure be further improved. By conducting a critical analysis of the level of capital project development in Nigeria in relation to government expenditure, this study will close the information gap. Government has been borrowing money for

capital projects, which has prompted investigation into whether the borrowed funds were actually used for the intended project. This analysis will also examine data upto 2022 and the reasons why capital projects have not received full funding. The arguments arising from this study will also be buttressed and supported by a number of economic theories.

The broad objective of this study is to examine government capital expenditure and its effect on economic growth in Nigeria. The specific goals are to:

- i) to evaluate the impact of road capital investment on Nigeria's real gross domestic product.
- ii) to ascertain how capital investments in education affect Nigeria's gross national product.
- iii) to look into how Nigeria's growth rate is impacted by capital investments in healthcare facilities

The research questions that will be posed are as follows:

- i) What is the effect of road capital investment on Nigeria's real gross domestic product?
- ii) How does capital spending on education affect Nigeria's gross national product?
- iii) How does Nigeria's growth rate respond to capital investments in healthcare facilities?

The following are the hypothesis that will be tested:

H₀: There is no significant relationship between capital expenditure on road and Real Gross Domestic Product in Nigeria.

H₀: There is no significant relationship between capital expenditure on education and gross National Product in Nigeria

H₀: There is no significant relationship between capital expenditure on health facilities and growth rate in Nigeria.

Using time series data, this study will concentrate on government capital spending and how it affects economic growth in Nigeria. It will cover the period of ten (10) years (2012 to 2021). Road, education, and healthcare spending are the independent variables, which will be proxies by real gross domestic product (RGDP), gross national product (GNP), and growth rate are used to assess economic growth, which is the dependent variable.

II. Review of Related Literature

.According to Muguro (2017), government expenditures are all costs incurred by a government of a country for its overall demands. These costs fall under the categories of on-going and capital (development) expenditures. Recurrent expenditures are routine purchases made by the government for things like employee pay and salaries, goods and services, and other administrative costs. They differ from capital investments, which are typically made in the form of investments in development projects like the building of roads, bridges, trains, schools, and hospitals, among other things. According to Wanjiru (2015), government spending on the health and education sectors promotes the formation of human capital that will be more resourceful and sufficiently innovative to boost economic growth.

In order to control inflation, unemployment, depression, balance of payment equilibrium, and stability of the foreign exchange rate, government spending is a valuable fiscal instrument, according to Taiwo (2016). Government expenditure boosts overall demand at a time of depression and unemployment, and production and supply of products and services move in the same direction. Acquiring goods and services for immediate consumption to meet the individual or societal needs is known as government consumption expenditure, whereas purchasing goods and services with the intention of generating future benefits is known as government investment expenditure (government gross capital formation).

There are three types of government spending: current, recurring, and capital. Recurrent government expenditure refers to the costs that the government incurs for its upkeep, for the benefit of society and the economy as a whole. Capital government expenditure refers to spending on fixed assets such as roads, schools, hospitals, buildings, plant, and machinery, the benefits of which are durable and lasting for several years (Uwaezuoke, Nweke & Ogar, 2018). Government spending significantly affects a country's overall economic activities. The ability to work, save, and invest; the inclination to work, save, and invest; and the distribution of economic activity among various uses and locales all affect government spending on production (Musa & Asare, 2013).

Government expenditures, according to Brown and Jackson (2016), are costs incurred by the government for its own upkeep as well as the supply of products, services, and projects required to support or encourage economic growth and enhance the welfare of its citizens. On the basis of expenditures made for a country's citizens, government spending is estimated. Investments in social security, education, and infrastructure make up a sizable component of government spending. Government spending may be one of two types: capital or ongoing. As there could be some lags between when it is incurred and when it has an impact on the economy, capital expenditure is defined as spending that creates future benefits. The term "capital expenditure" refers to the sums spent on the purchase of fixed (productive) assets (whose useful lives extend beyond the accounting or fiscal year), as well as the sums spent on the upgrade and improvement of existing fixed assets, including intangible assets, like lands, buildings, roads, machines, and equipment. This category of government spending also includes research expenditures. Capital expenditure is typically viewed as an investment that will yield future advantages Brown & Jackson (2016),

Classification of Government Expenditure

Government spending can be categorized in five different ways: by public level, by ministries, extra-ministerial departments, and parastatals; by economic life span; by expenditure object; and by sectoral economic functions. Government spending in Nigeria is divided into four functional categories: administration, economic services, social and community services, and transfers with a mix of capital and recurring expenditures (CBN, 2021).

- i. **Administration:** General administration, defense, internal security, and national assembly are all included in the government's administrative expenses in Nigeria.
- ii. **Economic Services:** These expenses cover things like transportation, communication, agriculture, and other economic services.
- iii. **Social and Community Services:** This category covers money spent on things like health care, education, and other forms of volunteer work.
- iv. **Transfers:** These include costs for paying down the nation's debt, pensions, bonuses, contingencies/subventions, other costs, and freight fees.

Reasons for the Rise in Government Expenditure

Based on empirical research, a number of variables may be causing increased government spending in several countries. One important element that could lead to increased government spending, according to Hong and Nadler (2015), is expanding sources of taxation. Other research, such those by Asongu and Jellal (2016), have also demonstrated that elements like access to foreign aid and grants may also encourage increased public spending, which is a common occurrence in the majority of low-income nations.

El Atmani (2021) claims that the primary goal of public expenditure growth is to raise the quantity and caliber of public service delivery while also increasing the efficacy and efficiency of government expenditure management procedures. Four justifications for such incremental reforms are listed below;

i. Improve Public Service: Higher government spending can result in better public services including health, education, and transportation. These are critical for improving both economic and living quality.

ii. Increase the economy's productivity capacity: Some forms of government spending can aid in overcoming market failure. For instance, education can lower structural unemployment and aid boost labor output. The long-term trend rate of growth may be accelerated with carefully focused education spending. However, not every government spending is guaranteed to boost overall public spending; some initiatives may fail or be inefficient.

iii. Expansionary fiscal policy: Higher aggregate demand is anticipated to result from more government spending without higher taxation. Although it may result in a budget deficit, the increased government spending provides a boost to consumer spending and could speed up economic growth.

iv. Reduce Inequality: Social Security accounts for a large portion of government spending. Benefits including those for unemployment, income support, children, and housing are included in this. Most of these benefits are means-tested, which means they are intended for low-income individuals. The goal is to lessen inequality and relative poverty.

Expenditure on Road/High Way (Infrastructure)

The expenditure of constructing roads, bridges, canals, and tunnels for the transportation of people, cargo, and goods is referred to as high way expenditure (Nasiru, 2012). the spending on long-term assets or essential infrastructure, such as highways, railroads, airports, and utilities, which is anticipated to result in greater increases in economic output. Highway infrastructure investment fosters long-term economic growth by establishing enabling environments and connecting populations. This increases business productivity by enabling the production of more goods and services with the same amount of inputs. Increased infrastructure spending by the government is typically anticipated to boost firm output overall, both in the short term by boosting demand and in the long run by raising overall productivity.

Expenditure on Education

According to Okoro (2013), public expenditure on education includes both current and capital expenditures and includes funding for both public and private educational institutions, administration of education programs, and subsidies for private entities (students, households, and other private entities). The amount of general government spending (current, capital, and transfers) on education is stated as a share of all general government spending across all sectors, including health, education, social services, and other areas. It comprises expenses paid for by government transfers from external sources. Pre-primary and primary education, secondary education, post-secondary non-tertiary education, tertiary education, education that

cannot be categorized by level, auxiliary services to education, R&D education, and education are all included in the category of education.

Concept of Economic Growth

According to Kimberly (2019), economic growth is a rise in a state's ability to produce products and services over a given period of time. Gross domestic product can be used to gauge a country's or state's economic growth. These metric accounts for the nation's output and productive capacity. All products and services generated in the nation are consumed as part of the gross domestic product. According to Maingi (2017), there are numerous elements that contribute to economic growth, but they are more closely linked to higher rates of investment by the public or private sectors than they are to other factors like consumption spending, higher rates of school enrolment, and more political stability. This argument has challenged the neo-classical theory of growth, which held that economic growth could be fostered and encouraged by proper policies, but that it might also emerge from technical change brought about by chance. By taxing consumption, supporting investment and research, reallocating funds from government consumption to government investment, and creating an environment that allows the private sector to drive growth, government policies can be designed to increase economic growth rates. Government actions, however, can limit the rate of economic growth. For instance, borrowing by the government to pay for on-going expenses, a high corporate tax rate, a lack of investment in capital stock, and high exchange and interest rates are just a few examples.

Igbasan (2017) clarified that another indicator of economic growth is if the country's gross domestic product includes commodities and services that adequately address the pressing needs of a sizeable population. He also argued that four key indicators—national resources, human resources, technological advancement, and capital formation—can be used to measure economic progress.

According to the aforementioned, economic growth quantification is "that national output should consist of such goods and services that satisfy the maximum number of people's wants, which implies that the rate of rise in total output must be greater than the rate of population growth: Economic growth is a crucial macroeconomic indicator that is frequently used to evaluate the degree of wellbeing among people around the world. Economic growth and economic development are phrases that are frequently used interchangeably and occasionally used interchangeably. The two names do not, however, have the same meaning. Arnold (2011) claims that the word "economic growth" particularly refers to a rise in the total value of goods and services produced by a nation over a period of time, often a year. Akwe (2014) went on to say that a nation must be creative and productive in order to increase its gross domestic product (GDP) by assuring full employment, a low interest rate, and increased industrial output. A completely functioning economy with complete control over economic factors has a high propensity to increase the size of its gross domestic product GDP, which would therefore increase economic growth (David & Anyiwe, 2013).

The Keynesian Theory of Public Expenditure

The originator of macroeconomics, John M. Keynes, a British economist, asserted that public spending is a key factor in determining economic growth in 1936. In 1936, this notion was first put forth. The fiscal policy tool (i.e., public expenditure) is a crucial tool for obtaining both short-term stability and a superior long-run growth rate, according to Keynes' theory. According to this idea, public interventions in the economy should be made through economic policy, notably fiscal policy. According to the Keynesian theory, government spending will boost economic expansion. According to Keynes, government intervention in the economy is necessary because it has the power to reverse economic downturns by borrowing money from the private sector and reinvesting it through a variety of expenditure initiatives. Additionally, the economy will benefit from public

capital and recurrent spending on the construction of high-quality classrooms and laboratories, the acquisition of teaching and learning aids like computers, and the payment of salaries. Investment in education will raise the quality of the labor force, which will increase productivity and development. In order to plan and administer the economy, it will also aid in the development of a group of educated leaders in both the public and private sectors.

According to the argument, government intervention in the economy is necessary because it has the power to reverse economic downturns by borrowing money from the private sector and reinvesting it through a variety of expenditure initiatives. Additionally, the economy will benefit from public capital and recurrent spending on the construction of high-quality classrooms and laboratories, the acquisition of teaching and learning aids like computers, and the payment of salaries. Investment in education will raise the quality of the labor force, which will increase productivity and development.

Economic Growth Theory

Since Adam Smith wrote his book *Wealth of Nations* in the eighteenth century, which is centered on the desire of growth, the philosophy of economic growth has a long history. According to G.D.P., economic growth is an increase in the monetary worth of a nation's commodities and services during a specific time period. However, since the 1980s, the growth criticism has steadily given way to the idea that economic expansion and environmental degradation may be "decoupled." The World Commission on Environment and Development highlighted such a 'decoupling' viewpoint as a crucial component of sustainable development. Critics have been casting doubt on the feasibility of such decoupling more and more recently; many now advocate zero or even negative growth. So far, the supporters of growth continue to hold the upper hand. The opposition's arguments now cover a wider variety of topics rather than just the initial focus on resource depletion and environmental harm. Arguments for and against economic expansion, according to Xue (2010), argues that the increase in services generated in a country over an extended period of time is what economic growth is. A country is supposed to continuously increase its G.D.P. for sustainability, and it is measured by an increase in G.D.P. that has been adjusted for inflation. Economic development theories can be classified into three categories: classical, neo-classical, and the Solo-Swan modern theories. This study aims at analyzing the Solo-Swan contemporary theory, which emphasizes the three variables of labor, capital, and technology that influence economic growth, with an emphasis in particular on the role of technology in infrastructure development and economic growth as measured by G.D.P.

This study will be anchored on the above theories which will invariably expand the frontier of knowledge.

Empirical Review

Duruechi and Chigbu (2022) focus on the economic development paradigm and government capital spending in Nigeria from 1990 to 2020. The immediate goal was to ascertain how capital spending by the government will affect Nigeria's economic growth. Government capital spending was broken down into economic, social, and community services, transfers, and administration, while per capita income served as a stand-in for economic progress. The World Bank Data website (WDI) and the Central Bank of Nigeria statistical bulletin were used to gather data for the study.. The study suggested that Nigeria's government urgently become more proactive by honestly plugging any leaks that allow civil servants and other government employees to siphon money intended for capital projects out of the country. This can be accomplished by automating government sector spending in order to decrease interpersonal contact, which facilitates collaboration on how to siphon public monies.

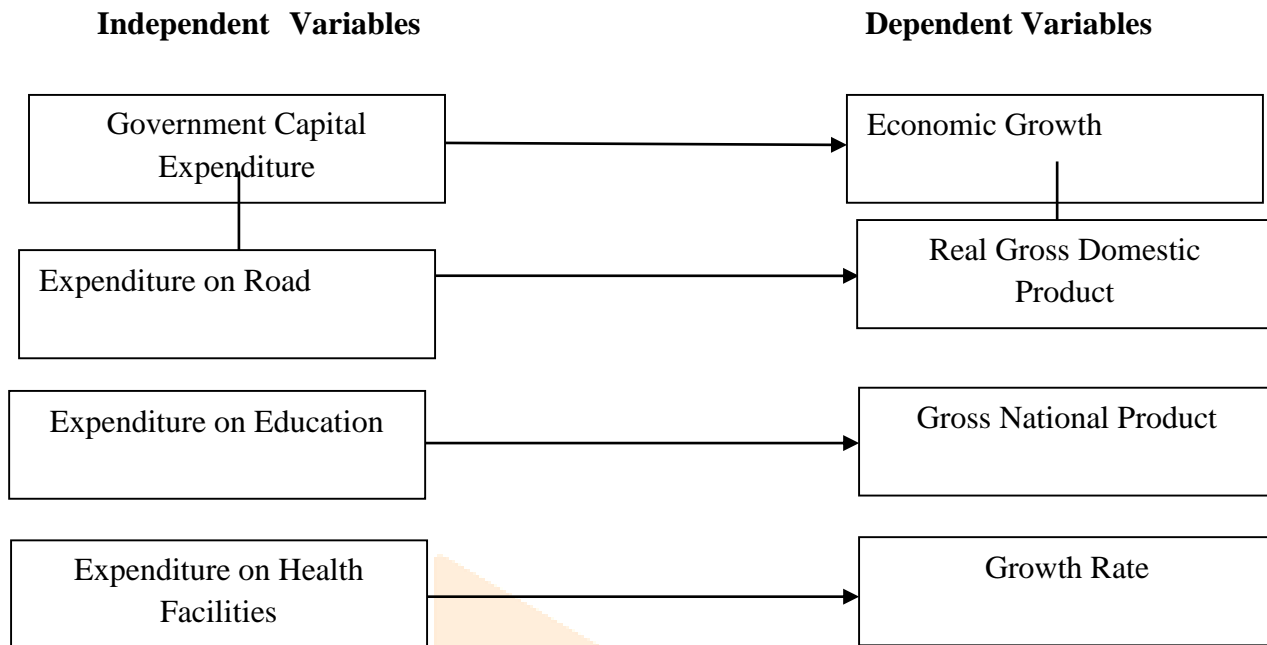
Using the bound test (ARDL) approach, Udo, Ekere and Inibegbe (2022) investigated the impact of total government spending on economic growth in Nigeria during the years 1981–2018. The co-integration result suggests that total government expenditure (LTGE) and economic growth in Nigeria have a long-term relationship. According to ARDL findings, Nigeria's total government spending (LTGE) had a favorable impact on economic growth. According to Wagner's theory, the granger causality test result shows that there is a one-way causal relationship from LGDP to LTGE for the observed period. It is advised that public funds be used effectively to provide security and essential infrastructure, particularly for the provision of energy and road infrastructure, which are prerequisites to successful economic performance.

To ensure accountability, transparency, and financial responsibility when carrying out public assignments, public funds should be appropriately handled. The fight against corruption in the country should be taken head-on since it is thought that if corruption is dealt with, more public funds will be made available for development and public spending will have a greater impact on economic performance. To ensure prompt and appropriate treatment of corruption concerns, public institutions in the nation that are tasked with doing so should be reformed and strengthened.

Enya and Ezeali (2021) looked at Public Infrastructure Investment and Nigeria's Economic Growth. E-View was used in the study's use of Econometric analysis. The study's stationarity test revealed that each variable was stationary at the first difference, $I(1)$ which led the researchers to look for signs of co-integration between the variables. As a result, the co-integration test result indicates that there is evidence of two co-integration equations, indicating a long-term link between the variables. The ECM test had a good adjusted coefficient of determination of 92.78% and a well-signed -0.019307 with a joint statistical probability of 0.00000. According to the study, public investments in educational infrastructure, power, and technology all have favorable relationships with the economy, however transportation has a negative link. The study went on to draw the conclusion that public investment is crucial for boosting the Nigerian economy, particularly in this period of democracy.

For the years 1981 to 2020, Ugochukwu and Oruta (2021) looked at the impact of various government expenditure components on economic growth in Nigeria. Secondary data were used as the basis for the analysis. The Granger Causality Test and Error Correction model were used in the investigation. The short-run model showed that the elements of government spending, such as recurring expenditures on health, education, and agriculture, have a negligible adverse effect on economic growth. Recurrent spending on debt service, road construction, and other expenses showed a favorable and insignificant impact on economic growth. Government capital spending on social services has been found to have a negative and considerable effect on economic growth with regard to capital spending. Government spending on economic services, however, showed a positive and negligible impact on Nigeria's economic growth. Over time, every aspect of the employed government spending had a substantial impact on economic expansion. The research's findings do not definitively prove that either Keynesian theory or Adolf Wagner's law apply in Nigeria. The study's findings indicate that the Nigerian economy is not headed for long-term development and expansion. According to the report, the government should allocate more money to priority industries including agriculture, infrastructure, health, and education. In order to boost domestic revenue and lower government borrowing, the government should also promote investment and output using monetary and fiscal policies. The study also highlights the need for increased budgetary openness, tighter oversight of government initiatives, and increased efficiency in government spending.

Conceptual Model



Source: Researcher's Conceptual Model, 2023.

III. RESEARCH METHODOLOGY

3.1 Population and Sample

The data on the capital expenditure on roads, education and health facilities from 2012 to 2021 were used as sample population. The three sectors reflect the major government capital expenditure for the period of the study.

3.2 Data and Source of Data

For this study secondary data was obtained from the Central Bank of Nigeria Statistical Bulletin 2021. The data gathered from Central Bank of Nigeria Statistical Bulletin 2021 was analysed using Ordinary Least Square (OLS) estimation techniques with the aid of E-view version 9. Descriptive statistics, unit root and regression are evaluated to provide relevant answers to the research question.

3.3 Theoretical Framework

Variables of the study contains dependent and independent variable. The study used pre-specified method for the selection of variables. The study used Economic growth as dependent variable. From the capital expenditure on roads, Education and health facilities, Real Gross Domestic Product (RGDP), Gross National Income (GNP) and Growth rate are measured.

Capital expenditure is the independent variable proxy by expenditure on roads, education and health facilities.

Measurement of Variable

Table 1.1

S/N	Variables	Type of Variable	Measurement
1	Economic Growth	Dependent	Expenditure on road, education and health facilities. Real Gross Domestic Product (RGDP), Gross National Product (GNP) and Growth Rate.
2	Capital Expenditure	Independent	Expenditure on road, education and health facilities.

Source: Researcher's Compilations (2023)

Model Specification

The model for the study is given below:

Mathematically

$$Y = f(X_1, X_2, X_3, \dots, X_n) \dots \dots \dots 1$$

Where Y denotes dependent variable and X_1, X_2 and X_3 represent explanatory variables

$$EG = f(CE) \dots \dots \dots 2$$

Expanded to

$$RGDP = f(CER) \dots \dots \dots 3$$

$$GNP = f(CEE) \dots \dots \dots 4$$

$$GR = f(CEHF) \dots \dots \dots 5$$

In econometric term

$$RGDP = \beta_0 + \beta_1 CER_1 + \mu \dots \dots \dots 6$$

$$GNP = \beta_0 + \beta_1 CEE_1 + \mu \dots \dots \dots 7$$

$$GR = \beta_0 + \beta_1 CEHF_1 + \mu \dots \dots \dots 8$$

Where:

EG = Economic Growth

CE= Capital Expenditure

RGDP = Real Gross Domestic Product

GNP = Gross National Product

GR = Growth Rate

CER = Capital Expenditure on Road

CEE= Capital Expenditure on Education

CEHF= Capital Expenditure on Health Facilities

β_0 = Constant term

$\beta_1 - \beta_3$ = coefficient of explanatory variables

μ = Error term.

A-prior Expectation

Table 3.1.1

Variables	Expected Outcome (Positive/Negative)
Capital Expenditure on Road	Positive
Capital Expenditure on Education	Positive
Capital Expenditure on Health Facilities	Positive

Source: Researcher's Compilation, 2023.

IV. RESULTS AND Discussion

4.1 Results of Descriptive Statics of Study Variables

Table 4.1: Descriptive Statics.

	RGDP	GNP	GR	CER	CEHF	CEE
Mean	116145.3	68704.29	2.360394	136.8739	277.1973	447.6957
Median	108737.3	69493.19	2.528199	121.2471	251.4440	397.1785
Maximum	176075.5	73382.77	6.222942	206.1105	423.3298	646.7475
Minimum	72599.63	60670.05	-1.920000	83.30000	180.0000	325.1900
Std. Dev.	34178.66	3804.837	2.704158	45.03047	91.61810	126.3394
Skewness	0.419916	-0.996917	-0.282922	0.422067	0.511722	0.619300
Kurtosis	1.953898	3.136213	2.110653	1.658524	1.678329	1.698508
Jarque-Bera	0.749852	1.664137	0.462966	1.046716	1.164271	1.345004
Probability	0.687340	0.435148	0.793356	0.592527	0.558704	0.510430
Sum	1161453.	687042.9	23.60394	1368.739	2771.973	4476.957
Sum Sq. Dev.	1.05E+10	1.30E+08	65.81224	18249.69	75544.88	143654.7
Observations	10	10	10	10	10	10

Source: E-View Output, (2023)

Table 4.1 is an illustration that in the period that the study was undertaken. Real Gross Domestic Product (RGDP) had an average figure of 116145.3 and a lowest figure being 72599.63 while the highest figure was 176075.5. Gross National Product (GNP) mean was 68704.29 and lowest figure observed was 60670.05 while the highest figure was 73382.77. Growth Rate (GR) mean value of 2.360394 and minimum value observed to be -1.920000 while the maximum value was 6.222942. The table also illustrates the Capital Expenditure on Road (CER) mean of 136.8739 and the minimum value observed was 83.30000 while the maximum value was 206.1105. Capital Expenditure on Health Facilities (CEHF) mean of 277.1973 and the minimum value observed was 180.0000 while the maximum value was 423.3298. Capital Expenditure on Education (CEE) mean of 447.6957 and the minimum value observed was 325.1900 while the maximum value was 646.7475. The Jarque-Bera normality test indicates that all the variables are normally distributed. It can be deduced that all variables employed were normally distributed.

Unit Root Test at Level

Group unit root test: Summary

Series: RGDP, GNP, GR, CER, CEHF, CEE

Date: 05/04/23 Time: 15:45

Sample: 2012 2021

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	1.55812	0.9404	6	53
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin stat	1.69180	0.9547	6	53
ADF - Fisher Chi-square	7.93281	0.7904	6	53
PP - Fisher Chi-square	12.1318	0.4352	6	54

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Source: E-View Output,(2023)

The table 4.2.2 above present the group unit root test, using ADF as the criteria for decision. It was found that all variables in the model were non stationary at levels which is not statistically qualified for further estimation because it might bring spurious estimates. However, the ADF test was carried out to test the stationary of the variables and found all the variables stationary at first difference, showing the existence of no unit root. This indication is made through the p value against that of 5% and 10% level of significance as shown above.

4.2.3 Unit Root Test at Difference

Group unit root test: Summary

Series: RGDP, GNP, GR, CER, CEHF, CEE

Date: 05/04/23 Time: 15:49

Sample: 2012 2021

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test.

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.75828	0.0000	6	42
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.17848	0.0147	6	42
ADF - Fisher Chi-square	26.9837	0.0078	6	42
PP - Fisher Chi-square	30.6052	0.0023	6	42

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Source: E-View Output, (2023)

Differencing is essential in order to reduce or eliminate trend in unit root test result which would in turn stabilize the mean of the time series. The unit root result in table 4.2.3 above shows that the independent and dependent variables under the study i.e Real Gross Domestic Product (RGDP), Gross National Product (GNP), Growth Rate (GR), Expenditure on road, education and health facilities are stationary at first difference at 0.05 (5%) significance level since the probability of 0.0000 is less than 0.5.

Regression Analysis

Model 1

Dependent Variable: RGDP

Method: Least Squares

Date: 05/04/23 Time: 15:59

Sample: 2012 2021

Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17496.82	12066.41	1.450043	0.1851
CER	720.7250	84.15358	8.564402	0.0000
R-squared	0.901658	Mean dependent var		116145.3
Adjusted R-squared	0.889366	S.D. dependent var		34178.66
S.E. of regression	11368.42	Akaike info criterion		21.69192
Sum squared resid	1.03E+09	Schwarz criterion		21.75244
Log likelihood	-106.4596	Hannan-Quinn criter.		21.62554
F-statistic	73.34898	Durbin-Watson stat		1.636955
Prob(F-statistic)	0.000027			

Source: E-View Output, (023)

The regression table revealed shows that the constant value stands at 17496.82 which equally mean that while all other variables remain constant, Real Gross Domestic Product will increase by 17496.82. Capital expenditure on road with the coefficient of 720.7250 has a positive relationship with Real Gross Domestic Product which also means that for every unit increase in capital expenditure on road, there will be 720.7250 increase in the Real Gross Domestic Product. The regression result also shows that capital expenditure on road with p-value of 0.0000 has significant effect on Real Gross Domestic Product.

The coefficient of determination R^2 with value of 0.901658 implies that 90% of the variation of Real Gross Domestic Product is influenced by capital expenditure on road while the remaining 10% is being explained by other variables outside the model but captured by the error term. Also, the adjusted R^2 explain fitness of the regression remained high by 89% after adjusting for the degree of freedom. The Durbin Watson statistics in the model is 1.636955 which shows that there is positive autocorrelation exist among variables because the value lies between 1.5 to 2. The f- statistics in the regression line shows the p-value is 0.000027. Since, the p-value is less than 5% level of significance ($0.000027 < 0.05$). We can easily infer that capital expenditure on road has effect on economic growth in Nigeria under the period of study.

Model 2

Dependent Variable: GNP

Method: Least Squares

Date: 05/04/23 Time: 16:08

Sample: 2012 2021

Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	60133.89	3809.509	15.78521	0.0000
CEE	19.14336	8.219683	2.328966	0.0482
R-squared	0.404056	Mean dependent var		68704.29
Adjusted R-squared	0.329563	S.D. dependent var		3804.837
S.E. of regression	3115.408	Akaike info criterion		19.10296
Sum squared resid	77646155	Schwarz criterion		19.16348
Log likelihood	-93.51482	Hannan-Quinn criter.		19.03658
F-statistic	5.424083	Durbin-Watson stat		0.684515
Prob(F-statistic)	0.048239			

Source: E-View Output, (2023)

The regression table revealed shows that the constant value stands at 60133.89 which equally mean that while all other variables remain constant, Gross National Product will increase by 60133.89. Capital expenditure on education with the coefficient of 19.14336 has a positive relationship with Gross National Product which also means that for every unit increase in capital expenditure on education, there will be 19.14336 increase in the Gross National Product. The regression result also shows that capital expenditure on education with p-value of 0.0482 has significant effect on Gross National Product.

The coefficient of determination R^2 with value of 0.404056 implies that 40% of the variation of Gross National Product is influenced by capital expenditure on education while the remaining 60% is being explained by other variables outside the model but captured by the error term. Also, the adjusted R^2 explain fitness of the regression remained high by 33% after adjusting for the degree of freedom. The Durbin Watson statistics in the model is 0.684515 which shows that there is negative autocorrelation exist among variables because the value lies between 0 to 1.4. The f- statistics in the regression line shows the p-value is 0.048239. Since, the p-value is less than 5% level of significance ($0.048239 < 0.05$). We can easily infer that capital expenditure on education has effect on economic growth in Nigeria under the period of study.

Model 3

Dependent Variable: GR

Method: Least Squares

Date: 05/04/23 Time: 16:18

Sample: 2012 2021

Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.856668	2.740769	2.136870	0.0651
CEHF	-0.012613	0.009435	-1.336893	0.2180
R-squared	0.182613	Mean dependent var		2.360394
Adjusted R-squared	0.080439	S.D. dependent var		2.704158
S.E. of regression	2.593118	Akaike info criterion		4.920455
Sum squared resid	53.79408	Schwarz criterion		4.980972
Log likelihood	-22.60228	Hannan-Quinn criter.		4.854068
F-statistic	1.787283	Durbin-Watson stat		1.610664
Prob(F-statistic)	0.218025			

Source: E-View Output,(2023)

The regression table revealed shows that the constant value stands at 5.856668 which equally mean that while all other variables remain constant, Growth Rate will increase by 5.856668. Capital expenditure on health facilities with the coefficient of -0.012613 has a negative relationship with growth rate which also means that for every unit increase in capital expenditure on health facilities, there will be -0.012613 decrease in the growth rate. The regression result also shows that capital expenditure on health facilities with p-value of 0.2180 has insignificant effect on growth rate.

The coefficient of determination R^2 with value of 0.182613 implies that 18% of the variation of growth rate is influenced by capital expenditure on health facilities while the remaining 82% is being explained by other variables outside the model but captured by the error term. Also, the adjusted R^2 explain fitness of the regression remained high by 8% after adjusting for the degree of freedom. The Durbin Watson statistics in the model is 1.610664 which shows that there is positive autocorrelation exist among variables because the value lies between 1.5 to 2. The f- statistics in the regression line shows the p-value is 0.218025. Since, the p-value is greater than 5% level of significance ($0.218025 > 0.05$). We can easily infer that capital expenditure on health facilities has insignificant effect on economic growth in Nigeria under the period of study.

Discussion of Findings

Model 1

Capital expenditure on road has a positive relationship with Real Gross Domestic Product. This result is in line with the results of Ugochukwu and Oruta (2021), Odubuasi, Ifurueze and Ezeabasili (2020). The regression result also shows that capital expenditure on road has significant effect on Real Gross Domestic Product. This result is in line with Odubuasi, Ifurueze and Ezeabasili (2020) but contrary with the results of Ugochukwu and Oruta (2021).

Model 2

Capital expenditure on education has a positive relationship with Gross National Product. This result is in line with the results of Amadi and Alolote (2020), Enya and Ezeali (2021) but contrary to the result of Ugochukwu and Oruta (2021). The regression result also shows that capital expenditure on education has significant effect

on Gross National Product. This result is in line with Amadi and Alolote (2020), Enya and Ezeali (2021) but contrary with the results of Ugochukwu and Oruta (2021).

Model 3

Capital expenditure on health facilities has a negative relationship with growth rate. This result is in line with the results of Amadi and Alolote (2020) but contrary to the result of Ugochukwu and Oruta (2021). The regression result also shows that capital expenditure on health facilities has insignificant effect on growth rate. This result is in contrary with the results of Amadi and Alolote (2020), Ugochukwu and Oruta (2021).

H₀: There is no significant relationship between capital expenditure on road and Real Gross Domestic Product in Nigeria.

Decision Rule: Since the p-value of capital expenditure on road which is 0.0000 and lesser than 5% level of significance, we reject null hypothesis and concluded that there is significant relationship between capital expenditure on road and Real Gross Domestic Product in Nigeria.

H₀: There is no significant relationship between capital expenditure on education and Gross National Product in Nigeria.

Decision Rule: Since the p-value of capital expenditure on education which is 0.0482 and lesser than 5% level of significance, we reject null hypothesis and concluded that there is significant relationship between capital expenditure on education and Gross National Product in Nigeria.

H₀: There is no significant relationship between capital expenditure on health facilities and Growth Rate in Nigeria.

Decision Rule: We accept the null hypothesis and draw the conclusion that there is no significant link between capital spending on health facilities and Growth Rate in Nigeria because the p-value for capital expenditure on health facilities is 0.2180 and greater than 5% level of significance.

5.0 Summary, Conclusion And Recommendation

This study examined government capital expenditure and how it affected economic growth in Nigeria from 2012 to 2021. The regression result demonstrated a statistically significant positive relationship between real gross domestic product and capital investment on roads. The outcome also showed that capital spending on education has a positive and large impact on the gross national product, whereas capital spending on health facilities has a negative and small impact on growth rate.

According to the coefficient of determination R² with a value of 0.901658, capital expenditure on roads accounts for 90% of the variation in real gross domestic product, with the remaining 10% being explained by factors outside the model but included in the error term. In addition, after accounting for the degree of freedom, the adjusted R² explain fitness of the regression remained high by 89%. The regression line's f- statistics indicate that the p-value is 0.000027. Since the p-value (0.0000270.05) is less than the 5% criterion of significance. We may simply conclude that road capital investments had an impact on economic growth in Nigeria during the study period.

The coefficient of determination R^2 with value of 0.404056 implies that 40% of the variation of Gross National Product is influenced by capital expenditure on education while the remaining 60% is being explained by other variables outside the model but captured by the error term. Also, the adjusted R^2 explain fitness of the regression remained high by 33% after adjusting for the degree of freedom. The f- statistics in the regression line shows the p-value is 0.048239. Since, the p-value is less than 5% level of significance ($0.048239 < 0.05$). We can easily infer that capital expenditure on education has effect on economic growth in Nigeria under the period of study.

The coefficient of determination R^2 with value of 0.182613 implies that 18% of the variation of growth rate is influenced by capital expenditure on health facilities while the remaining 82% is being explained by other variables outside the model but captured by the error term. Also, the adjusted R^2 explain fitness of the regression remained high by 8% after adjusting for the degree of freedom. The f- statistics in the regression line shows the p-value is 0.218025. Since, the p-value is greater than 5% level of significance ($0.218025 > 0.05$). We can easily infer that capital expenditure on health facilities has insignificant effect on economic growth in Nigeria under the period of study.

Conclusion

The regression result revealed that capital expenditure on road and capital expenditure on education have significant effect on economic growth in Nigeria at 5% critical value while capital expenditure on health facilities have insignificant effect on economic growth in Nigeria at 5% critical value. However, the F-statistic result confirmed that the combined explanatory variables have significant effect on economic growth. Thus, based on the f-statistics result it was concluded that government capital expenditure has a significant effect on economic growth in Nigeria.

Recommendations

Based on the findings of the study, it is therefore recommended that;

- i. Government in Nigeria should increase spending on highway projects in order to provide the necessary infrastructure that can increase the productivity of the private sector, facilitate the distribution of raw materials and completed goods, and promote economic growth.
- ii. The government should monitor on how education budgets are being implemented to make sure they are being used wisely.
- iii. The government should also raise capital expenditures budget in an effort to stimulate economic growth in Nigeria.

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Appendix 1

YEAR	RGDP (N'B)	GNP (N'B)	GR (%)	CER (N'B)	CEE (N'B)	CEHF (N'B)
2012	72,599.63	60,670.05	4.21	83.30	348.40	197.90
2013	81,009.96	63,942.85	5.49	92.19	390.40	180.00
2014	90,136.98	67,977.46	6.22	116.30	343.75	195.98
2015	95,177.74	69,780.69	2.79	114.60	325.19	257.70
2016	102,575.42	68,652.43	-1.58	97.92	339.28	200.82
2017	114,899.25	69,205.69	0.82	126.19	403.96	245.19
2018	129,086.91	70,536.35	1.91	150.17	465.30	296.44
2019	145,639.14	72,094.09	2.27	189.09	593.33	388.37
2020	154,252.32	70,800.54	-1.92	206.11	646.75	423.33
2021	176,075.50	73,382.77	3.40	192.86	620.59	386.24

Source: Central Bank of Nigeria Statistical Bulletin,(2021)