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AN ECONOMETRIC SCRUTINY OF THE IMPACT OF PUBLIC EXPENDITURE ON ECONOMIC GROWTH IN NIGERIA FROM 1970 - 2013

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Abstract
This study examines econometrically the impact of public (government) expenditure on economic growth in Nigeria. We carry out ex-post facto research since it had already arisen, and the judgmental sampling technique was used with a sample of forty-three (43) for the years 1970 - 2013. A premeditated collection procedure with a non-probabilistic sampling technique was used as an instrument of data collection. Hypotheses were framed to guide the study, and in data analysis, we use a t-test, F-test and other econometric statistical tools such as the unit root. Our findings revealed that Public or Government expenditure has a significant effect on the economic growth of Nigeria. We recommend that the government increase its expenditure on Capital expenditure, especially on rural roads, industries, and electricity generation, which will accelerate the growth rate in the productive sector of the economy and raise the standard of living in Nigeria.

Keywords: Public or government expenditure, Capital expenditure, economic growth, productive sector, growth rate, and the economy.

1.0 INTRODUCTION

1.1 Background of the study

The role of the government sector in economic management is performed through the formulation and implementation of economic policies, especially fiscal policy, lead to economic growth (Abomaye-Nimenibo & Inimino, 2016).

According to Abomaye-Nimenibo (2020), Economic Growth is the increase in the inflation-adjusted market value of the properties and services produced by the economy in 12 Calendar

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months, and it is measured as the per cent rate of increase in the real gross domestic product (GDP) in per capita terms.

Growth is generally calculated in real terms, i.e., inflation-adjusted figures, to eradicate the twisting effect of price rises of goods manufactured. The National Income Accounting method is one of the tools of measurement of economic growth.

The rate of economic growth is the regular annual growth rate in GDP between the first and the last year of operation, meaning that it is the movement in the average level of GDP over the epoch, which implicitly ignores the GDP fluctuations around the trend. An increase in economic growth is the more efficient use of inputs such as labour productivity, physical capital,

energy, or materials, which is intensive growth. The GDP growth caused only by an increase in the number of inputs available for use (increased population, new territory) is called extensive growth.

Economic growth has been well-defined in two ways, the first as the continued yearly upsurges in an economy's actual countrywide revenue over an extended period, and the second being the rising trend of net national product at constant prices, which was criticised as inadequate and unsatisfactory because, while the total national income may be increasing, the standard of living may be decreasing, and the populace increasing at a quicker frequency than the total national income. If national income (NI) is rising by 1% per year and the population is snowballing at 2% per year, the average living standard will fall since the population increases faster than the national income capita income will keep on declining. The per capita income will rise as the national income surges faster than the populace in a normal situation.

Therefore, the third and better way of defining economic growth is to do so in terms of per capita income, which means that the annual increase in a country's real per capita income is over a long period.

Defining economic growth in terms of per capita income or output is better because it raises the people's standard of living. Another point worth mentioning about the definition of economic growth is that the growth in national revenue or increase in per capita income or production must be a continual growth if it is called economic growth. By a sustained growth in per capita income, we mean the upward or rising per capita income trend over a long period. An ordinary short-time increase in per capita income, such as that which occurs over a business cycle, cannot be validly called economic growth.

The rate of economic growth is measured in terms of an increase in general Net National Product (NNP) or Gross National Product (GNP) and is an increase in per capita income, i.e. how much real goods and services have produced the country. The Gross National Product (GNP) measures the total output of goods and services produced, which an average individual of the municipal will have for consumption and investment, an average living level for a country's citizen. Thus, the World Bank and IMF have employed both economic growth measures to compare growth and standard of living of developed and undeveloped countries published in the annual World Development Report. The Indian Central Statistical Organization (CSO) and the Reserve Bank of India have measured economic growth based on overall GNP or NNP and per capita income. Their study reveals a remarkable feature that economic growth achieved in recent years is higher in developing countries than in developed countries. However, in the past decades to the present, it was observable that developed countries documented higher growth rates than the developing

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countries, which remained static for a lengthy period. So, the developed countries' people's per capita income and living standards are higher than those of developing countries.

However, the economy's growth rate is calculated using GDP data, which each country's statistical agencies usually estimate. The GDP/capita growth percentage is calculated using GDP and people for the initial and final periods included in the analysis. In national income accounting, per capita output is calculated using the following factors: output per unit of labour input (i.e., labour productivity), hours worked (intensity), the percentage of the working-age population, known as "participation rate", and the percentage of the working-class to the total people is known as "demography", while the rate of change of GDP/population being the sum of the rates of change of the four variables including their cross products. Increases in labour productivity (the ratio of output to labour effort) have factually been the most vital basis of real per capita economic growth.

Professor Robert Solow stated that technological progress has accounted for 80 per cent of the long-term rise in the US per capita income, with increased investment in the capital, which explained the remaining 20 per cent."

There are various measures of productivity, i.e. the broad measure of productivity. By contrast, total factor productivity (TFP) growth measures change total output relative to the change in capital and labour inputs.

Several prominent authors, especially of the neoclassical school, argue that increased public expenditure may slow down the economy's aggregate performance because, raising expenditure, the government may have to increase taxes and go into borrowing. The higher income tax may discourage or disincentive additional work, which may reduce income and aggregate demand. Similarly, high corporate tax leads to increased production costs and reduces firms' profitability and money to sustain investment spending. Alternatively, more significant administration borrowing (from the banks) to finance its expenditure may compete and crowd-out private sector inducement, which will decrease private investment in the economy. Sachs (2006) believes that developed countries with high taxation and high public well-being spending achieve better measures of economic performance than countries with low rates of tax policy and small social expenditure. However, Hayek (1989) has a contrary view saying that high administration spending levels are harming and do not promote societal well-being, provoked fairness, fiscal equality, and international keenness. This dispute is in line with Sudha (2007) view, who pointed out those countries with large public sector expenditure have grown slowly. Thus, there is no consensus among scholars on the impact of increasing public spending on economic growth.

Nigeria's federal government devotes 52.2% of total revenues, and the balance is shared between the States and Local Government Areas based on the complex sharing formula (Revenue Mobilization Allocation and Fiscal Commission (RMFC), 2011).

The level of government revenue from oil revenue and non-oil revenues, including borrowing from internal and external sources, has significantly affected Nigeria's level of public expenditure. Our table 1 displays the total recurrent expenditure which increased from ₦716,100,000 million in 1970 to ₦4,805,200,000 billion in 1980 and further to ₦3,325,178,000,000 Trillion in 2012. The government capital expenditure rose in 1970 from ₦187,800,000 million to ₦10,163,400,000 billion in 1980 and increased to ₦874,800,000,000 billion in 2012 (CBN Statistical Bulletin, Vol. 18, pp. 105-106, Dec.2007; and Vol. 23, p. 97,

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Dec. 2012). Similarly, the total government recurrent expenditure increased to ₦3,689,148,100,000 trillion in 2013, while the total government capital expenditure for the same period increased to ₦1,108,377,000,000 trillion.

Between 1960 and 1969, the Gross Domestic Product (GDP) per capita of Nigeria lengthened by 132%, and further growth to 283% between 1970 and 1979 (CBN Statistical Bulletin, 50th special Anniversary Edition Dec. 2008). The attendant high inflation and unemployment rates resulted in a fiscal imbalance between 1979 and 1983 with negative payment balance consequences. The external loans increased tremendously within this period and fast-tracked the nation's debt burden with other teething problems that call for restructuring and overhauling the economy. Hence, the economic reform programme called the Structural Adjustment Programme (SAP), which was introduced in 1986. From the introduction of SAP to 1997, the GDP grew by 4% in response to economic adjustment policies (Onakaya et al., 2013). However, the real GDP, on an aggregate basis, grew at 7.9% in 2010 (CBN Annual Report page 114, 31st December 2010).

The Nigerian economy's performance reveals a massive increase in government total expenditure over the years, without a corresponding growth, a mismatch which authors contend that the link between public expenditure and economic growth are incomparable, with varying degrees of causality relationship (Onokaya et al., 2012). Therefore, the question arises: What is the relative contribution of capital expenditure and recurrent expenditure on Nigeria's economic growth? This work investigates the impact of public expenditure (recurrent expenditure and capital expenditure) on Nigeria's economic growth from 1970 – 2013.

1.2 Statement of the Problem

Controversy over the relationship between public expenditure and economic growth has continued to generate a series of debate among scholars as government performs, among others, two crucial functions of (i) creating the rule of law and the enforcement of property rights over citizens lives and properties internally (Abdullahi et al., 2000), and (ii) protecting or securing the nation from external aggression, through the defence, and providing certain public goods by building roads, oversees education, health, power and communication, to mention but a few (Nurudeen *et al.*, 2008).

In Nigeria, the public expenditure has continued to rise due to additional receipts of revenue from Petroleum profit tax and royalties, and Company income tax, custom and excise duties, value-added tax [VAT] and others (CBN Statistical Bulletin Vol.23, Dec. 2012); and increased demand for public (utilities) goods such as the provision of health care, communication, power, better education and construction of roads and bridges etcetera. Also, there is a growing demand for internal and external security for the people and the nation. The question is whether the increased expenditure brings about economic growth?

Scholars hardly agree with the assertion that public expenditure brings about economic growth. Others think that no matter the increase in public expenditure, there shall not be any economic growth. Therefore, the researcher determines to find out whether public expenditure brings about economic growth.

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1.3 Purpose of the Study

This study is to ascertain the validity of the statement that public expenditure has a significant impact on inducing economic growth in Nigeria.

The effect of public investment expenditure on economic growth in Nigeria is our focus in this study.

1.4 Research Questions:

Research questions guiding this study are:

i. Does public capital expenditure exert any significant effect on economic growth in Nigeria?
ii. Has recurrent government expenditure contributed to economic growth in Nigeria?
iii. Has government capital investment influenced economic growth?
iv. Does recurrent government expenditure in Nigeria impact significantly on economic growth in Nigeria?

1.5 Statements of Research Hypotheses

The hypotheses that guided this study are:

i. H_o: Capital Investment Spending has no significant effect on economic growth in Nigeria.
H_1: Capital Investment Spending has a significant effect on economic growth in Nigeria.
ii. H_o: Public capital expenditure has no significant contribution to economic growth in Nigeria.
H_1: Public capital expenditure has a significant contribution to economic growth in Nigeria.
iii. H_o: Public Recurrent expenditure has no significant impact on economic growth in Nigeria.
H_1: Public Recurrent expenditure has a significant impact on economic growth in Nigeria.
iv. H_o: Public expenditure does not influence economic growth in Nigeria.
H_1: Public expenditure has influenced economic growth in Nigeria.

1.6 Model Variables:

The variables included in the study are Gross Domestic Product (GDP), Government Recurrent Expenditure (GREX), and Government Capital Expenditure (GCEX). GDP is used as an explained variable, while GREX and GCEX are the explanatory variables, while factors not included in the model due to the crowd-out effect are known as the random or stochastic variable, the error term.

1.7 Definition of Terms:

Capital expenditure refers to all expenses made on fixed assets such as the construction of roads and bridges, schools, hospitals, plant and machinery, etcetera, for which economic benefits are durable and lasting for several years.

Capital refers to Human-made resources (machinery and equipment) used to produce goods and services.

Recurrent expenditure: Spending government revenue on wages and salaries, payment of rent, pension & gratuity, supplies and services, interest payment, social security payment, etcetera.

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These things spent on is known as consumable items, which benefits are consumed within the financial year.

Expenditure: This is an outflow of resources from the government to other sectors of the economy.

Fiscal policy: Fiscal policy uses tax imposition to generate revenue for government spending to stimulate the economy.

Gross Domestic Product: This is the money value of goods and services produced in an economy during a period irrespective of the people who produced these goods and services.

Public expenditure: Refers to the spending made by the government of a country in the administration of the nation, its maintenance of the society and the economy as a whole.

Investment: Spending on capital goods and addition to inventories.

Economic growth: An upsurge in the number of goods and services produced per head of the population over time.

2.0 REVIEW OF RELATED LITERATURE

Economic growth:

Economic growth is a spectacle of market output and a rise in GDP. An increase in the number of goods and services produced per head of the population over a while. Consequently, as economist Amartya Sen pointed out that, "economic growth is one aspect of the process of economic development."

2.1 Model Specification

The models that will be used for this research are presented below. This model is formulated based on the hypothesis that was specified in the first chapter of this research. The model is specified to show the impact of capital government expenditure and recurrent government expenditure on the Nigerian economy's gross domestic product.

$$GDP = F(GREX, GCEX,)$$
$$GDP = \beta_0 + \beta_1 GREX + \beta_2 GCEX + \varepsilon$$
$$\beta_0 > 0,\ \beta_1 > 0,\ \beta_2 > 0$$

Where:

GDP = Gross Domestic Product

GREX= Government Recurrent Expenditure

GCEX= Government Capital expenditure

β_0 = Constant intercept

β_1 and β_2= Slopes of the regressions (co-efficient of the variables)

ε = Error term

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Our model used the Ordinary Least Square (OLS) method in its analysis, as it is considered the best linear unbiased estimator.
As our data was extensive, the variables' log function to lessen the discrepancy was applied, which calls for a new statistical linear model as follows:
LOG (GDP) = β_0+ β_1 LOG (GREX) + LOG(GCEX)β_2

2.2 Theoretical Review

Theories that were relevant and related to this study were reviewed. Public expenditure theory, traditionally, received only scant attention till recently. With the introduction of welfare economics, the state's role has expanded immensely in the infrastructural provision and public expenditure, attracting increasing attention, even in economic growth, regional disparities, planning, distributive justice, etcetera (Bhatia,2002).
The public expenditure theory may be discussed in different items like recurrent and capital expenditure. The two parts may also be conceived to allocate the economy's resources between providing public goods on the one hand and private goods.

2.2.1 Increasing Public Expenditure Theory

Two essential and well-known theories of increasing public expenditure have been developed. The first one is connected with Wagner (1890) and the other with Wiseman and Peacock (1979). On the one hand, Wagner revealed inherent tendencies for different government layers (such as Central, State and Local governments) to increase intensively and extensively. Wagner (1890) maintained a functional relationship between economic growth and government activities because expenditure grows faster than the economy. However, Nitti (1903) supported Wagner's thesis and concluded with empirical evidence that it was equally applicable to several other governments that differed widely from each other's. All tiers of governments' intentions (in peace or wartime), irrespective of its size, etcetera. had exhibited the same tendency of increasing public expenditure. However, on the other hand, Wiseman and Peacock (1961), in their study of public expenditure in the UK for 1890-1955, revealed that public expenditure does not increase smoothly and continuously but in bumps' fashion. At times, some social or other disturbance occurs, creating a need for increased public expenditure that the existing public revenue cannot meet.

2.2.2 Peacock and Wiseman's Theory of Expenditure

Peacock and Wiseman (1961)'s study is probably one of the best-known analyses of public expenditures' time pattern. Using the political theory of public determination, Peacock and Wiseman stated that governments like to devote more currency to spend, and on the other hand, residents of the country do not like to pay taxes. The government and citizens see taxation as setting a restraint on government expenditure. Once the income grew, tax revenue will grow, leading to the tax rate rises. In such circumstances, public expenditure will follow a gradual upward movement, and there shall be a deviation between what people desired of public expenditure and the level of taxation. However, during social upheaval periods, the steady upward trend in public expenditure would be distressed.

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At periods of war, famine, or social disaster, there is always a rapid increase in public expenditures; and the government will typically raise taxation levies. However, the rising of taxation levels would be regarded as acceptable to the people during the crisis. Peacock and Wiseman (1961) call such a trend the "displacement effect" because public expenditure displaces upwards private-public expenditure, which does not fall to its original level.

Taxation is not used to finance a war, but nations instead of borrow, creating debt charges. During periods of upheaval, the imperfection effect is created whereby the government expands the scope of its services to improve social conditions. Because peoples' perception of tolerable taxation levels does not return to its former level, the government can finance these higher levels of expenditures originating in the expanded scope of government and debt charges.

2.2.3 Public Expenditure Theory of Ernest Engel

A German economist Ernest Engel was writing simultaneously as Adolph Wagner in the 19th century, stated that the consumer budget automatically changes as family income increases over time. Families devote a smaller share of their incomes to some goods such as work clothing and a larger share on coats, expensive jewellery, etcetera.

As it is with the households in terms of spending when income increases, so it is with the government that spends more on consumption as its revenue increases.

At the end of the Nigeria/Biafran civil war, national development became the nation's yearnings and citizens. There is a need for overhead capital expenditure on roads, harbours, power installations, pipe-borne water, general reconstruction, etcetera. However, as the economy developed, one would expect the public share in capital formation to decline over time. Thus, the individual expenditure pattern is compared to national expenditure, and Engel's finding is referred to as the declining portion of expenses on foods.

2.2.4 Wagner Law of Increasing State Activities

Wagner (1890) was laying emphases on long-term inclination in public expending. His concerned was not on the machinery of the increase in public expenditure, but the historical experience, whereby the exact quantifiable relationship between the degree of increase in public expenditure and the time it takes for the increase was not fixed; hence, the rate of increase could not be predicted.

Wagner's law of the increasing state's activities and expenditure will increase at a rate slower than the national income. State expenditure had indeed increased at a faster rate in the past than now. Thus, at every initial stage of economic growth, the state expands its activities faster in government's spendings on education, transportation, communications, health, civil amenities, infrastructures, etcetera. However, when the initial deficiency is removed, the increase in state activities may slow down. The factors that contribute to the tendency to increase public expenditure related to the state's growing role in the ever-increasing socio-economic complexities of modern society are getting weaker.

2.3.2 The Impact of Government Spending on Economic Growth

The classical economists propounded the doctrine of laissez-faire in the mechanisms of the economy. One of the proponents, named Smith (1776), claimed that administrations are always

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and without exclusion, are the greatest spendthrifts of public money. He believes that individuals, acting in self-will, usually encourage public goods consumption under the guidance of the invisible hand's market forces. He maintained that people should be left unhindered to pursue their best interests and, in the process, they would benefit society.

Nonetheless, to classical economists, unemployment is a theoretical impossibility that overwhelmed international nations like the great depression of the 1930s. Keynes' (1936) work had a profound and pervasive influence on economists and governments for many years. Keynes advocated using public expenditure as an economic policy tool to manage the national economy to counteract unemployment. This method requires an expansive fiscal policy, in which the government consciously finetune the budget to be in deficit by spending more money borrowed than raising it through taxation, which multiplier effect would counteract unemployment. By increased public spending, the government counters unemployment, and the public gets additional state benefits for nought since there is no increased taxation.

This “Pimp Priming” (Government spending accompanied by deficit financing to promote economic recovery) concept did not mean that government should be significant; instead, the Keynesian theory asserts that government spending, especially deficit spending, could provide short-term stimulus help with the economy from depression or recession. The Keynesians even argued that the government should be ready to reduce spending once the economy recovered to prevent inflation that might result from the economic growth process.

2.4 EMPIRICAL LITERATURE

Vedder and Gallaway (1998), discussing the relationship between government spending and economic growth, stated that output attracts investments through government spending as government levies are minimal. Public spending's productive effects are likely to exceed the raising funds for social costs at a low level. Beyond some point, further expansion of government spending no longer leads to output expansion due to the law of diminishing returns set in. The cost of growth reducing government spending for further growth-enhancing expenditure will diminish, leading to economic stagnation and decline. If public spending is focused on unproductive actions, there will be adverse effects on government spending.

Government spending resulted from taxes, borrowing from within and outside the country, Tariffs, Etc.

Mitchell (2005) stated that several reasons make government spending harmful to economic growth. These are:

i. The extraction cost.
ii. High taxes on work discourages saving and investment.
iii. Borrowing from abroad deprive private investment and may lead to higher interest rates, which will bring import Inflation and demeans a nation’s currency, causing economic distortions.

He further stated that the economic growth rate might be adversely affected by the transfer of resources from manufacturing, in the private sector, to the public sector to provide social services. The transfer of resources is referred to as displacement cost (where government spending displaces private sector activities), which dampens economic growth since the market forces of demand and supply guide the allocation of resources in the private sector.

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Thirdly, there is a negative multiplier cost as government spending finances harmful intervention. The federal budget portion is used to financing activities that generate a harmful effect on monetary actions.

Fourthly, the private sector continually searches for new opportunities and options than the Public sector, whose programmes are fundamentally unbending and being highly centralised due to bureaucracy.

Finally, government spending on activities such as education, hospital, postal services, airports, seaports, etcetera with less cost and in most cases with less quality. Evidence abound where the private sector provides the same services at higher quality and lower cost. Mitchell (2005) advised that the small nation's governments should not fail to provide a legal system, a stable monetary regime, and other core functions effectively and efficiently would not promote economic growth.

Ram (1986) talks of government size influencing economic growth. The larger the government size is, the likely detrimental and inefficient. The political, regulatory process exercises unnecessary financial costs and burdens on the economic system and unpopular fiscal and monetary policies that tend to distort economic incentives, lowering the system's productivity. At the other extreme, other points of view assigned to the government a critical role in economic growth. The government's role in harmonising conflicts between private and social interests, preventing the country's exploitation by foreigners, securing an increase in productive investment, and providing a socially optimal economic growth direction is necessary.

While explaining and analysing the influence of government expenditure on economic growth, Barro (1990) states that productive government spending entails devoting more resources to property right enforcement and actions that affect production function. He argued that if government spending is held constant, an increase in the average marginal tax rate would lower the growth or saving rates. An increase in non-productive government expenditure (government consumption expenditure, for example) lowers the growth and savings rates. These effects arise because higher non-productive government expenditure has no direct effect on private sector productivity but rather a higher income tax rate.

Barro (1990) states further that there are relatively high returns to increase public spending when it starts from a low base, without imposing the rule of law on health and education spending.

The World Bank Development Report (1988) stated that the public sector's expanded role carries risks and opportunities. The risks come from the ineffective use of public resources and the overextension of government policies into better-managed areas by private markets. He advocated for less government intervention, leaving out bureaucracy in its policies. In the efficient civil services market, high market failures, and lower distortionary effect of the tax, greater government involvement may be appropriate. It is the public finance task to balance the opportunities and risks and improve the quality of government. The critical aspects of public finance within which pragmatic policies should be pursued are the management of public deficits, revenue mobilisation, and allocation of public spending and decentralisation of functions.

Krueger (1990) guided as to how the government will spend to bring a positive impact on economic growth through:

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i). any decision on some set of procedures for deciding what fits within the outlined policy scope and an administrative apparatus for implementing it.
ii). Provision of a presumption favouring policies and programmes requiring a minimum administrative and bureaucratic input.
iii). Enactment of policies directly controlling private activity is less efficacious in achieving their objectives than policies that provide incentives for individuals to undertake the deemed desirable activities.

Musgrave (1959) argued that, over the development period, total investment becomes a proportion of GNP, with public investment falling. Once the economy grows, a more considerable amount of saving is done, raising the private industries' capital stock. Musgrave went on to say that the raw stock of social overhead capital, similar to public utilities, becomes a declining share of net capital formation.
Rostow (1960) also contended that as the economy grasps the maturity stage, the mix of public expenditures will shift from infrastructure expenditures to welfare expenditure such as health, education, and welfare services. The next stage is the mass consumption stage, whereby income maintenance programmes and welfare redistributive policies will breed expressively and comparatively to other public expenditure items and relative to GNP.
Wagner (1890) postulated the law of rising public expenditure by analysing trends in public expenditure growth and the public sector's size in many countries. Wagner's law of public expenditure postulates that:

i. increasing functions of the state lead to a surge in public expenditure on administration and control of the economy;
ii. the growth of contemporary industrial society would spring up political pressure for communal improvement and calls for a collective grant for social reflection in the demeanour of manufacturing outfits and;
iii. increase in public expenditure will be more than a comparative upsurge of national income, which will allow upshot expansion of the public sector.

Peacock and Wiseman (1961) study has recognised the displacement effect where public expenditure increases during a war or in periods of social unrest. At the crisis, public expenditure will fall, but not to the first level. In such a case, the increase in war-related expenditures displaces both public and private civilian expenditures meaning that, while total public expenditures rise dramatically, the increase is less than the increase in war-related expenditure.
The Peacock and Wiseman model critiques have asked the question: what happens to the increase in government expenditure in the post-war period? Brukhead and Mrinal (1979) stated no long-run displacement effect where civilian public expenditures in the post-war period except that the initial growth path returns or public expenditures came back to the pre-war inclination level.
Beyond these macro models discussed above, demographic change has been cited as contributing to public expenditure growth. As the population increases, the level of activity produced in the public sector would have to be expanded to serve the larger population. Nevertheless, other

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demographic trends such as changes in the population's structure (age and sex) and geographical distribution also have to be considered.

2.5 Structure of Government Expenditure (Capital versus Recurrent Expenditure)

Despite the difficulties in putting clear demarcation between capital and recurrent expenditures, the classification of public expenditure in recurrent expenditures sheds some light on their implications for economic growth.

In principle, capital expenditure is broadly defined as an outlay on the acquisition of fixed assets to enhance the production of goods and services. Such outlay includes spending on land development, constructing power plants, buildings, dams, roads, schools, health, and purchasing plants and equipment (Bhatia, 2008).

Recurrent expenditure comprises items recurring in government economic and social services budgets, including payment salaries, wages, subsidies, administrative expenses, operation and maintenance services, pension and debt services (CBN Statistical Bulletin vol. 21st December 2010).

In 1976, General Olusegun Obasanjo emphasised direct state participation in business activities in the economy. Direct participation led to an increase in investment and capital projects, and this increased capital expenditure. Between 1975 to 1983, increasing capital expenditure more than recurrent expenditure.

Ukwu (2004) stated that the representative government of Shehu Shagari in 1979 embarked on Federal Capital Territory development, housing scheme and river basin development worldwide.

3.0 METHOD OF STUDY

Building on the existing theoretical literature, this study perceives a causal relationship between government expenditure (Recurrent and Capital) and Nigeria's economic growth using time series data from 1970 to 2013. This section looks at research design, data collection instrument, administration of the data collection instrument and procedures for processing collected data and analysis.

3.1 Research Design

This study's design is an ex-post-facto correlation design adopted to investigate the impact of government expenditure on economic growth within the Nigerian context because the variables studied had already occurred. The Gross Domestic Product (GDP) is the dependent variable, while the Government Recurrent Expenditure (GREX) and Government Capital Expenditure (GCEX) are the independent variables. Ex-post facto research is a systematic empirical study in which the researcher does not control or manipulate the independent variable (s) because of the situation, for the study already exists (Asika, 1991). A non-experimental research design technique in which a pre-existing group can be compared on the dependent variable or variable can be correlated. Ex-post facto was considered most appropriate since the variables had already occurred to show how Government Recurrent Expenditure and Government Capital Expenditure impacted Nigeria's economic growth within the period under review.

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3.4 Characteristics of the Study Population

This study's characteristics on government (public) expenditure on Administration, Economic Services, Social and Community Services, and Transfers in the economy's growth forms the variables. Our model's variables are the Gross Domestic Product (GDP) as the explained variable being the Dependent variable. The variables that made-up the GDP are in two groups, namely:

i. Government Recurrent Expenditure and
ii. Government Capital Expenditure.

The explanatory variable is the independent variable which consists of:

i. Government Recurrent Expenditures on Administration (GREXAD,
ii. Government Capital Expenditures on Administration GCEXAD),
iii. Government Recurrent Expenditures on Economic Services (GREXES),
iv. Government Capital Expenditures on Economic Services (GCEXES),
v. Government Recurrent Expenditures on Social & Community Services (GREXSCS)
vi. Government Capital Expenditures on Social and Community Services (GCXSCS),
vii. Government Recurrent Expenditures on Transfers (GREXTR)
viii. Government Capital Expenditures on Transfers (GCXETR), as explanatory variables.

3.5 Sampling Design and Procedures

To achieve the study's purpose, the judgmental sampling technique, a non-probability sampling technique, was used to draw a sample size of 44 from 1970 to 2013. These sampling procedures selected units in some non-random process and non-parametric statistics. The Central bank of Nigeria statistical bulletins provided the GDP data and government expenditures on Administration, Economic Services, Social and Community Service, classified into Government Recurrent expenditure and Government Capital expenditure.

3.6 Data Collection Instrument

A self-designed collection procedure, a non-probabilistic sampling technique, was used as an instrument of data collection. A secondary source was employed to collect the relevant time series data from Statistical Bulletins of the Central Bank of Nigeria.

3.7 Administration of the Data Collection Instrument

The CBN Librarian in Uyo supplied the data as requested.

3.8 Method of Data Analysis

Based on the perceived causal relationship between the identified variables of the research interest, a multiple regression model, which is stochastic, is specified to forgo a link between government expenditure and economic growth, to accommodate the possible influence of other variables that may exert an effect on economic growth but which are not included in the model. The study recognises the influence of such random or intervening variables as government expenditure components adequate to explain economic growth.

The estimated model is discussed vis-a-vis stated apriori theoretical expectations about the sign of model coefficients' numerical values.

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Estimating the model is via the Ordinary Least Squares (OLS) techniques facilitated by applying the software for empirical econometric analysis, E-Views in analysing our regression output, through Estimates of model coefficients to determine the significance of variables upon economic growth. The evaluation basis is the t- and F statistics, respectively, at 0.05 level of significance and relevant degrees of freedom.

The model's explanatory power is determined by measuring the goodness of fit, using the determination coefficient (R-Square and adjusted R-Square). These statistics enhance insight into how the various government expenditures explain Nigeria's economic growth for the period under review. The empirical econometric approach is adopted in analysing data considered relevant components of government expenditure and economic growth.

4.0 DATA PRESENTATION AND ANALYSIS:

Collected data is presented and analysed in this section. The purpose of the analysis is to ascertain using reliable evidence to show the impact of public (government) expenditure on Nigeria's economic growth within the period under review.

4.1 DATA PRESENTATION

We use secondary data collected from the Central Bank of Nigeria’s Statistical Bulletin (2013). The data collected are presented in table 4.1 below.

This table shows the values of Gross domestic product (GDP), Government Capital expenditure (GREX) and Government recurrent expenditure (GCEX) in the Nigerian economy between the year 1970 to 2013.

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TABLE 4.1: GROSS DOMESTIC PRODUCT (GDP), GOVERNMENT RECURRENT EXPENDITURE (GREX) AND GOVERNMENT CAPITAL EXPENDITURE (GCEX) IN NAIRA (₦)

YEARS	GDP	GREX	GCEX	LOGGDP	LOGGREX	LOGCEX
1970	5281100000	715200000	187800000	9.72	8.85	8.27
1971	6650900000	823600000	173600000	9.82	8.92	8.24
1972	7187500000	1012300000	451300000	9.86	9.01	8.65
1973	8630500000	963500000	565700000	9.94	8.98	8.75
1974	8823100000	1517100000	1223500000	9.95	9.18	9.09
1975	21475200000	2734900000	3207700000	10.33	9.44	9.51
1976	26655800000	3815400000	3786600000	10.43	9.58	9.58
1977	31520300000	3819200000	5004600000	10.5	9.58	9.7
1978	34540100000	2800000000	5200000000	10.54	9.45	9.72
1979	41974700000	3187200000	4219500000	10.62	9.5	9.63
1980	49632300000	4805200000	10163400000	10.7	9.68	10.01
1981	47619700000	4846700000	6567000000	10.68	9.69	9.82
1982	49069300000	4885700000	6420200000	10.69	9.69	9.81
1983	53107400000	5278800000	4885700000	10.73	9.72	9.69
1984	59622500000	5827500000	4100100000	10.78	9.77	9.61
1985	67908600000	7576200000	5464700000	10.83	9.88	9.74
1986	69147000000	7696900000	8526800000	10.84	9.89	9.93
1987	105222800000	15646200000	6372500000	11.02	10.19	9.8
1988	139085300000	19409400000	8340100000	11.14	10.29	9.92
1989	216797500000	25994200000	15034100000	11.34	10.41	10.18
1990	267550000000	36219600000	24047800000	11.43	10.56	10.38
1991	312139700000	38243500000	28340900000	11.49	10.58	10.45
1992	532613800000	54072200000	39763600000	11.73	10.73	10.6
1993	683869800000	82143600000	54501800000	11.83	10.91	10.74
1994	899863200000	85918900000	70918300000	11.95	10.93	10.85
1995	1933211600000	132899700000	121138300000	12.29	11.12	11.08
1996	2702719100000	124291300000	158678300000	12.43	11.09	11.2
1997	2801972600000	158563500000	269652500000	12.45	11.2	11.43
1998	2708430900000	178097800000	309015600000	12.43	11.25	11.49
1999	3194015000000	449662400000	498027600000	12.5	11.65	11.7
2000	4582127300000	461608500000	239450900000	12.66	11.66	11.38
2001	4725086000000	579329100000	438696500000	12.67	11.76	11.64
2002	6912381500000	867336500000	321378100000	12.84	11.94	11.51
2003	8487031600000	984250100000	241688600000	12.93	11.99	11.38

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2004	11411066910000	1032741300000	351259900000	13.06	12.01	11.55
2005	14572239120000	1223730000000	519510000000	13.16	12.09	11.72
2006	18564594730000	1485198200000	720768300000	13.27	12.17	11.86
2007	20657317670000	1589300000000	759281500000	13.32	12.2	11.88
2008	24296329290000	2117389000000	960890100000	13.39	12.33	11.98
2009	24712669900000	2127971500000	1152800000000	13.39	12.33	12.06
2010	33984773000000	3109378510000	883870000000	13.53	12.49	11.95
2011	37409862000000	3314513330000	918500000000	13.57	12.52	11.96
2012	40544052000000	3325178000000	874800000000	13.61	12.52	11.94
2013	42396846000000	3689148100000	1108377000000	13.63	12.57	12.04

SOURCE: CENTRAL BANK OF NIGERIA STATISTICAL BULLETINS

4.2 DATA ANALYSIS

We found steady trend of increase in values of GDP from 1970 to 2013. The GDP in 1970 was ₦5, 281,100,000 which rose to ₦267,550,000,000 in 1990. The GDP further improved from ₦4,582,127,300,000 to ₦33,984,773,000,000 between the year 2000 and 2010. It later stood at ₦42,396,846,000,000 in 2013.

Capital government expenditure maintained an irregular movement during the period chosen for this study. In the year 1981, CGEXP was 6,567, and it rose to 24,048.6 in the year 1990. It increased to 498,027.6 in the year 1999 and decreased to 351,300 in 2004. It later stood at 1,152,796.6 and 1,108,377 between the years 2009 to 2013.

The values of Recurrent government expenditure had an increasing trend during the period chosen for analysis. In the year 1981, RGEXP was 4,846.7, and it increased to 36,219 in the year 1990. It rose to 461,600 in the year 2000 then later increased to 3,689,148.1 in the year 2013.

We also found Gross fixed capital formation values to have followed an irregular trend during the period chosen for analysis. In the year 1981, GFCF 133,217.52 and declined to 40,121.31 in the year 1990. It rose to 41,342.64 in the year 2000 and then stood at 77,438.02 and 106,574.57 between 2010 and 2013.

4.3 INTERPRETATION OF REGRESSION RESULT

From our econometrical analysis, we obtained the estimate of a_0 as -127832.8, showing that the Dependable variable will initially be -127832.8 if the independent variables are zero.

The result of the estimate of a_1 is 0.832, revealing that CGEXP and GDP have a direct relationship whereby a unit change in CGEXP leads to 0.832 changes in GDP.

The estimate of a_2 is 11.138, showing a positive relationship between RGEXP and GDP, revealing that a unit change in RGEXP causes an 11.138 increase in GDP.

The t-ratio of a_0 estimate is -0.358, and the critical t-ratio from the statistical table is 2.021. Hence, at 5% level of significance with a 31 degree of freedom (N – 2 = 33 – 2 = 31) reveals that that a_0 estimate is not significant statistically as the empirical t-ratio is less than the critical value (i.e. -0.358 < 2.021).

The t-ratio estimate of a_1 is equal to 0.449 with the same 5% level of significance gave us a degree of freedom of 31, while the statistical table's critical t-ratio is 2.021. Our result implies that the estimate of a_1 is not statistically significant as the t-ratio is less than the critical t-ratio

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(i.e. 0.449 < 2.021), meaning that capital government expenditure has no significant economic growth impact.

The t-ratio estimate of a_2 is 18.790 with the same 5% level of significance gave us a degree of freedom of 31, while the statistical table's critical t-ratio is 2.021. Our result implies that the estimate of a_2 is statistically significant as the t-ratio is less than the critical t-ratio (i.e. 0.449 < 2.021), meaning that recurrent government expenditure has a significant economic growth impact.

The coefficient of determination (R^2) is 0.9883, meaning that the independent variables could explain 98.83% of the dependent variable's total variations, while the 1.17% unexplained was due to the error term.

The result of our adjusted coefficient of determination (R^2) is 0.9876, implying that the explanatory variables could explain 98.76% of the dependent variable's total variation. In comparison, the error term captured the 1.24% unexplained error term captured the 1.24% unexplained after taking cognisance of the degree of freedom.

The F-statistic value is 1276.797, which is greater than the statistical table value of 4.08 (i.e. 1276.797 > 4.08), revealing the coefficient of determination's statistical significance. Based on this result, the alternative hypothesis is accepted that government expenditure significantly impacted the Nigerian economy's economic growth.

The Durbin Watson statistics value of 1.132 is less than the statistical table value d_L= 1.321, thereby satisfying the related condition of 0< DW < d_l, 0 < 1.132 < 1.321, meaning that there is the presence of positive autocorrelation.

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

This study's main objective is to empirically examine the impact of government expenditure on Nigeria's economic growth. Therefore, we used secondary data from the Central bank of Nigeria's Statistical Bulletin (2013). The data collected was for forty-four years (i.e. 1970-2013), and we use the Ordinary Least Square Regression (OLS) Technique in analysing our data.

The result of the regression analysis reveals that recurrent government expenditure (GREX) and government capital (GCEX) expenditure were positively related to the gross domestic product (GDP), and so, we accept the alternate hypothesis, which states that; government expenditure has a significant impact on economic growth in Nigerian. The two explanatory variables, GREX and GCEX, have a value of 0.9942, meaning that these variables could explain that 99.42% of the gross domestic product's total variation after taking cognisance of the degree of freedom.

5.2 CONCLUSION

We have examined empirically the impact of government capital expenditure to bring about economic growth in Nigeria.

We also state that the government consumption expenditure pattern has depressed economic growth in Nigeria, which finding is in line with that of Barro (1990), who hypothesises that unproductive government expenditure is liable to depress economic growth; meaning that the government has to reduce its recurrent expenditure to stimulate economic growth.

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We also established that government capital expenditure in Nigeria could stimulate economic growth, which is in line with the theoretical supposition that productive government expenditure can promote economic growth. Therefore, Nigeria's current poor performance is attributable to improper distribution of government expenditure to areas of need.

We also observed, like Abomaye-Nimenibo (2016), that there has been

a). lack of consistent and long-term strategy for productivity improvement.

b). the extensive dominance of the public sector in the economy stifles private sector initiatives and operations with limited budgetary allocations.

c). the very weak corporate linkages among the various sectors of the economy which stiffens business linkages that facilitate innovation, higher productivity through specialisation and flexibility in meeting customer needs,

d). the weak linkage between the educational system and the requirements of the economy.

e). the low functioning of the labour and capital markets.

5.3 RECOMMENDATIONS

Based on our conclusions, the following recommendations are put forward as follows:

i. The Federal Government of Nigeria should prudently manage its capital expenditure to make economic growth.

ii. The government should increase its budget on Capital expenditure, especially on rural roads and create industries that will accelerate its growth.

iii. The government should improve the productive sectors by allocating more money towards this sector to generate employment.

iv. There should be a significant contribution to the power sector's infrastructural development, mainly because manufacturing industries will not spend a substantial amount of money saved and directed towards the companies' expansion.

v. The anti-graft or anti-corruption agencies such as the Independent Corrupt Practices Commission (ICPC) and EFCC (Economic and Financial Crime Commission) should also be directed to the administrative processes in schools in terms of due processes in the award of contracts and the recruitment processes in public offices.

vi. EFCC and ICPC should be practically independent and be more forceful in their actions, and also those who divert and embezzle public funds should be treated as criminals in Nigeria.

vii. The government should make a consistent and long-term strategic plan for productivity improvement.

viii. There should be extensive dominance of the public sector in the economy to bring about private sector initiatives and operations.

ix. The government of Nigeria should make concerted efforts to ensure that corporate linkages among the various sectors of the economy be harnessed to bring about business linkages that will facilitate innovation. Higher productivity through specialisation and flexibility in meeting customer needs enables economies of scale possible.

x. The government of Nigeria should have to sustain linkage between the educational system and the economy's requirements.

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Appendix A

Table 1 Total Government Recurrent and Capital Expenditure (₦)

Years	Total Recurrent Expenditure ₦	Total Capital Expenditure ₦
1970	716,100,000	187,800,000
1971	823,600,000	173,600,000
1972	1,012,300,000	451,300,000
1973	963,500,000	565,700,000
1974	1,517,100,000	1,223,500,000
1975	2,734,900,000	3,207,700,000
1976	3,815,400,000	4,041,300,000
1977	3,819,200,000	5,004,600,000
1978	2,800,000,000	5,200,000,000
1979	3,187,200,000	4,219,500,000
1980	4,805,200,000	10,163,400,000
1981	4,846,700,000	6,567,000,000
1982	4,885,700,000	6,417,200,000
1983	5,278,800,000	4,885,700,000
1984	5,827,500,000	4,100,100,000
1985	7,576,200,000	5,464,700,000
1986	7,696,900,000	8,526,800,000
1987	15,646,200,000	6,372,500,000
1988	19,409,400,000	8,340,100,000
1989	25,994,200,000	15,034,100,000
1990	36,219,600,000	24,048,600,000
1991	38,243,500,000	28,340,900,000
1992	54,072,200,000	39,763,300,000
1993	82,143,600,000	54,501,800,000
1994	85,918,900,000	70,918,300,000
1995	132,899,700,000	121,138,300,000
1996	124,291,300,000	158,678,300,000
1997	158,563,500,000	269,651,700,000
1998	178,097,800,000	309,015,600,000
1999	449,662,400,000	498,027,600,000
2000	461,608,500,000	239,450,900,000
2001	576,329,100,000	438,696,500,000
2002	867,336,500,000	321,378,100,000
2003	984,268,100,000	241,688,600,000
2004	1,032,741,300,000	351,259,900,000
2005	1,223,730,000,000	519,510,000,000
2006	1,290,201,900,000	552,385,800,000
2007	1,589,300,000,000	759,281,200,000
2008	2,117,362,000,000	960,890,100,000
2009	2,127,971,500,000	1,152,800,000,000

2010	3,109,378,510,000	883,870,000,000
2011	3,314,513,330,000	918,500,000,000
2012	3,325,178,000,000	874,800,000,000
2013	3,689,148,000,000	1,108,377,000,000

Source: CBN Statistical Bulletins

Appendix B

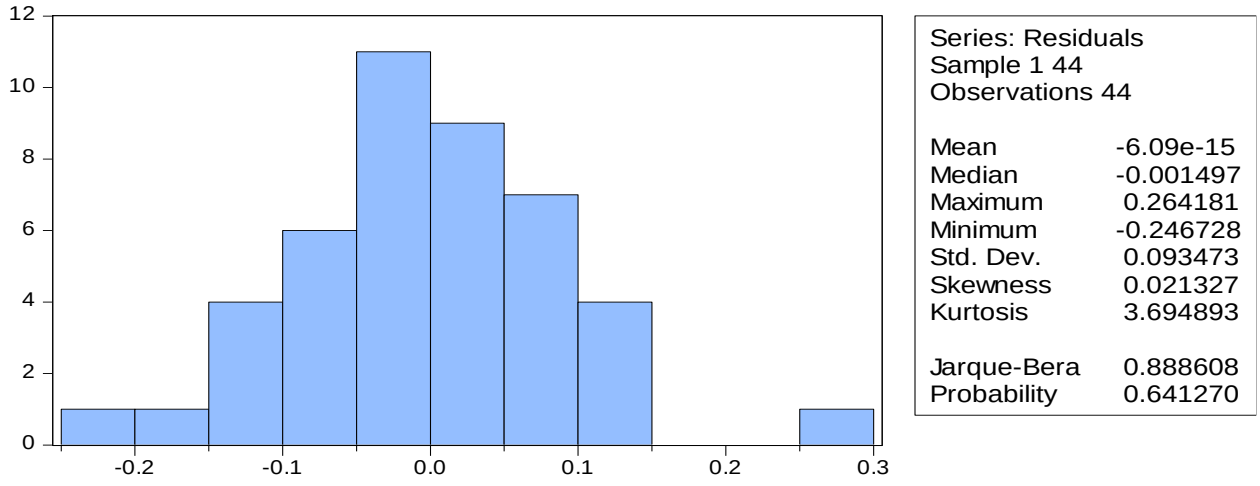
Dependent Variable: LOG(GDP)
Method: Least Squares
Date: 11/24/20 Time: 05:15
Sample: 1 44
Included observations: 44

LOG(GDP) = β_0+β_1LOG(GREX) β_2LOG(GCEX)+

	Coefficient	Std. Error	t-Statistic	Prob.
β_0	0.388429	0.138459	2.805369	0.0077
β_2	0.210543	0.059539	3.536228	0.0010
β_1	0.849352	0.055678	15.25461	0.0000

R-squared	0.994487	Mean dependent var	11.72773
Adjusted R-squared	0.994218	SD dependent var	1.258908
SE of regression	0.095726	Akaike info criterion	-1.788912
Sum squared resid	0.375700	Schwarz criterion	-1.667263
Log-likelihood	42.35607	Hannan-Quinn criter.	-1.743799
F-statistic	3698.010	Durbin-Watson stat	1.110998
Prob(F-statistic)	0.000000		

NORMALITY TEST



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HETEROSKEDASTICITY TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.013255	Prob. F(2,41)	0.1465
Obs*R-squared	3.934714	Prob. Chi-Square (2)	0.1398
Scaled explained SS	4.603488	Prob. Chi-Square (2)	0.1001

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/24/20 Time: 05:17
Sample: 1 44
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
B_0	-0.006308	0.020042	-0.314747	0.7545
LOG(GCEX)	0.017275	0.008618	2.004442	0.0517
LOG(GREX)	-0.015604	0.008060	-1.936037	0.0598

R-squared	0.089425	Mean dependent var	0.008539
Adjusted R-squared	0.045007	SD dependent var	0.014179
SE of regression	0.013856	Akaike info criterion	-5.654386
Sum squared resid	0.007872	Schwarz criterion	-5.532737
Log-likelihood	127.3965	Hannan-Quinn criter.	-5.609273
F-statistic	2.013255	Durbin-Watson stat	1.972693
Prob(F-statistic)	0.146544		

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MULTICOLLINEARITY TEST

	GCEX	GDP	GREX	RESID
GCEX	1	0.9814261168455654	0.9760166870524998	6.3760538263 75206e-13
GDP	0.9814261168455654	1	0.996396305978942	0.0742493125 0810419
GREX	0.9760166870524998	0.996396305978942	1	6.0667867798 20296e-13
RESID	6.3760538263 75206e-13	0.0742493125 0810419	6.0667867798 20296e-13	1

Pairwise Granger Causality Tests
Date: 11/24/20 Time: 05:22
Sample: 1 44
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LOG(GDP) does not Granger Cause LOG(GCEX)	42	6.15815	0.0049
LOG(GCEX) does not Granger Cause LOG(GDP)		1.33660	0.2751
LOG(GREX) does not Granger Cause LOG(GCEX)	42	3.27805	0.0489
LOG(GCEX) does not Granger Cause LOG(GREX)		0.40769	0.6681
RESID does not Granger Cause LOG(GCEX)	42	3.33844	0.0465
LOG(GCEX) does not Granger Cause RESID		0.86532	0.4293
LOG(GREX) does not Granger Cause LOG(GDP)	42	3.96792	0.0275
LOG(GDP) does not Granger Cause LOG(GREX)		0.13041	0.8781
RESID does not Granger Cause LOG(GDP)	42	4.92241	0.0127
LOG(GDP) does not Granger Cause RESID		0.48473	0.6197
RESID does not Granger Cause LOG(GREX)	42	0.18154	0.8347
LOG(GREX) does not Granger Cause RESID		0.35934	0.7005

UNIT ROOT TEST FOR LOG(GDP) - - - 1ST DIFF

Null Hypothesis: LOG(GDP) has a unit root

Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		6.886877	1.0000
Test critical values:	1% level	-2.619851	
	5% level	-1.948686	
	10% level	-1.612036	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 11/24/20 Time: 05:26
Sample (adjusted): 2 44
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDP(-1))	0.007638	0.001109	6.886877	0.0000

R-squared	-0.031549	Mean dependent var	0.090930
Adjusted R-squared	-0.031549	SD dependent var	0.084115
SE of regression	0.085431	Akaike info criterion	-2.059225
Sum squared resid	0.306538	Schwarz criterion	-2.018267
Log-likelihood	45.27334	Hannan-Quinn criter.	-2.044121
Durbin-Watson stat	1.851689		

Null Hypothesis: D(LOG(GDP)) has a unit root
Exogenous: None
Lag Length: 1LOG((Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.042638	0.0407
Test critical values:	1% level	-2.622585	
	5% level	-1.949097	
	10% level	-1.611824	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GDP,2))
Method: Least Squares
Date: 11/24/20 Time: 05:25
Sample (adjusted): 4 44
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(GDP(-1)))	-0.284261	0.139163	-2.042638	0.0479
D(LOG(GDP(-1),2))	-0.352884	0.148668	-2.373637	0.0226

R-squared	0.317352	Mean dependent var	-0.000488
Adjusted R-squared	0.299848	SD dependent var	0.118278
SE of regression	0.098969	Akaike info criterion	-1.740460
Sum squared resid	0.382003	Schwarz criterion	-1.656871
Log-likelihood	37.67943	Hannan-Quinn criter.	-1.710021
Durbin-Watson stat	2.158052		

UNIT ROOT TEST FOR LOG (GDP) - - - 1ST DIFF

Null Hypothesis: LOG(GCEX) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.277835	0.9996
Test critical values:	1% level	-2.619851	
	5% level	-1.948686	
	10% level	-1.612036	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GCEX))
Method: Least Squares
Date: 11/24/20 Time: 05:28
Sample (adjusted): 2 44
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GCEX(-1))	0.007807	0.002382	3.277835	0.0021

R-squared	-0.033593	Mean dependent var	0.087674

Adjusted R-squared	-0.033593	SD dependent var	0.162508
SE of regression	0.165215	Akaike info criterion	-0.740161
Sum squared resid	1.146427	Schwarz criterion	-0.699203
Log-likelihood	16.91346	Hannan-Quinn criter.	-0.725057
Durbin-Watson stat	2.101115		

Null Hypothesis: D(LOG(GCEX)) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.390439	0.0000
Test critical values:	1% level	-2.621185	
	5% level	-1.948886	
	10% level	-1.611932	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GCEX,2))
Method: Least Squares
Date: 11/24/20 Time: 05:29
Sample (adjusted): 3 44
Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(GCEX(-1)))	-0.832692	0.154476	-5.390439	0.0000

R-squared	0.414662	Mean dependent var	0.003095
Adjusted R-squared	0.414662	SD dependent var	0.241424
SE of regression	0.184707	Akaike info criterion	-0.516573
Sum squared resid	1.398780	Schwarz criterion	-0.475200
Log-likelihood	11.84804	Hannan-Quinn criter.	-0.501408
Durbin-Watson stat	1.965233		

UNIT ROOT TEST FOR LOG (GDP) - - - 1ST DIFF

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Null Hypothesis: LOG (GREX) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		5.705092	1.0000
Test critical values:	1% level	-2.619851	
	5% level	-1.948686	
	10% level	-1.612036	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GREX))
Method: Least Squares
Date: 11/24/20 Time: 05:29
Sample (adjusted): 2 44
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GREX(-1))	0.007938	0.001391	5.705092	0.0000

R-squared	-0.021284	Mean dependent var	0.086512
Adjusted R-squared	-0.021284	SD dependent var	0.097098
SE of regression	0.098126	Akaike info criterion	-1.782150
Sum squared resid	0.404405	Schwarz criterion	-1.741192
Log-likelihood	39.31623	Hannan-Quinn criter.	-1.767046
Durbin-Watson stat	2.211912		

Null Hypothesis: D(LOG(GREX)) has a unit root
Exogenous: None
Lag Length: 2 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.799333	0.0687
Test critical values:	1% level	-2.624057	
	5% level	-1.949319	
	10% level	-1.611711	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GREX,2))
Method: Least Squares
Date: 11/24/20 Time: 05:30
Sample (adjusted): 5 44
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(GREX(-1)))	-0.325064	0.180658	-1.799333	0.0801
D(LOG(GREX(-1),2)))	-0.491105	0.191215	-2.568335	0.0144
D(LOG(GREX(-2),2)))	-0.207116	0.159173	-1.301200	0.2012

R-squared	0.415670	Mean dependent var	0.002000
Adjusted R-squared	0.384085	SD dependent var	0.149567
SE of regression	0.117380	Akaike info criterion	-1.374754
Sum squared resid	0.509793	Schwarz criterion	-1.248088
Log-likelihood	30.49507	Hannan-Quinn criter.	-1.328955
Durbin-Watson stat	1.995718		

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Appendix C

TEST FOR CO_INTEGRATION

Date: 11/24/20 Time: 06:58
Sample (adjusted): 3 44
Included observations: 42 after adjustments
Trend assumption: Linear deterministic trend
Series: LOG(GCEX)LOG(GDP)LOG(GREX)

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesised No. of CE (s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.464711	36.95385	29.79707	0.0063
At most 1	0.220700	10.70605	15.49471	0.2302
At most 2	0.005532	0.232974	3.841466	0.6293

Trace test indicates one cointegrating eqn(s) at the 0.05 level.

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesised No. of CE (s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.464711	26.24780	21.13162	0.0087
At most 1	0.220700	10.47308	14.26460	0.1827
At most 2	0.005532	0.232974	3.841466	0.6293

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalised by b'*S11*b=I):

LOG(GCEX)	LOG(GDP)	LOG(GREX)
4.776250	-11.33449	7.808150
1.857646	7.357802	-9.154305
-2.446156	2.540746	0.376786

Unrestricted Adjustment Coefficients (alpha):

D(LOG(GCEX))	-0.077559	-0.034485	-0.005221
D(LOG(GDP))	0.025539	-0.026912	-0.003153
D(LOG(GREX))	0.003424	0.005431	-0.007036

1 Cointegrating Equation(s): Log likelihood 125.8525

Normalised cointegrating coefficients (standard error in parentheses)

LOG(GCEX)	LOG(GDP)	LOG(GREX)
1.000000	-2.373095	1.634787
	(0.40716)	(0.42648)

Adjustment coefficients (standard error in parentheses)

D(LOG(GCEX))	-0.370441
	(0.10311)
D(LOG(GDP))	0.121980
	(0.05995)
D(LOG(GREX))	0.016354
	(0.07489)

2 Cointegrating Equation(s): Log likelihood 131.0890

Normalised cointegrating coefficients (standard error in parentheses)

LOG(GCEX)	LOG(GDP)	LOG(GREX)
1.000000	0.000000	-0.824023
		(0.05928)
0.000000	1.000000	-1.036119
		(0.02399)

Adjustment coefficients (standard error in parentheses)

D(LOG(GCEX))	-0.434503	0.625356
	(0.10676)	(0.28150)
D(LOG(GDP))	0.071988	-0.487480
	(0.06020)	(0.15874)
D(LOG(GRE))	0.026442	0.001151
	(0.08023)	(0.21154)

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Appendix D
GROSS DOMESTIC PRODUCT (GDP), TOTAL GOVERNMENT RECURRENT EXPENDITURE (GREX) AND TOTAL GOVERNMENT CAPITAL EXPENDITURE (GCEX) IN NAIRA (₦)

YEARS	GDP	GREX	GCEX	LOGGDP	LOGGREX	LOGCEX
1970	5281100000	715200000	187800000	9.72	8.85	8.27
1971	6650900000	823600000	173600000	9.82	8.92	8.24
1972	7187500000	1012300000	451300000	9.86	9.01	8.65
1973	8630500000	963500000	565700000	9.94	8.98	8.75
1974	8823100000	1517100000	1223500000	9.95	9.18	9.09
1975	21475200000	2734900000	3207700000	10.33	9.44	9.51
1976	26655800000	3815400000	3786600000	10.43	9.58	9.58
1977	31520300000	3819200000	5004600000	10.5	9.58	9.7
1978	34540100000	2800000000	5200000000	10.54	9.45	9.72
1979	41974700000	3187200000	4219500000	10.62	9.5	9.63
1980	49632300000	4805200000	10163400000	10.7	9.68	10.01
1981	47619700000	4846700000	6567000000	10.68	9.69	9.82
1982	49069300000	4885700000	6420200000	10.69	9.69	9.81
1983	53107400000	5278800000	4885700000	10.73	9.72	9.69
1984	59622500000	5827500000	4100100000	10.78	9.77	9.61
1985	67908600000	7576200000	5464700000	10.83	9.88	9.74
1986	69147000000	7696900000	8526800000	10.84	9.89	9.93
1987	105222800000	15646200000	6372500000	11.02	10.19	9.8
1988	139085300000	19409400000	8340100000	11.14	10.29	9.92
1989	216797500000	25994200000	15034100000	11.34	10.41	10.18
1990	267550000000	36219600000	24047800000	11.43	10.56	10.38
1991	312139700000	38243500000	28340900000	11.49	10.58	10.45
1992	532613800000	54072200000	39763600000	11.73	10.73	10.6
1993	683869800000	82143600000	54501800000	11.83	10.91	10.74
1994	899863200000	85918900000	70918300000	11.95	10.93	10.85
1995	1933211600000	132899700000	121138300000	12.29	11.12	11.08
1996	2702719100000	124291300000	158678300000	12.43	11.09	11.2
1997	2801972600000	158563500000	269652500000	12.45	11.2	11.43
1998	2708430900000	178097800000	309015600000	12.43	11.25	11.49
1999	3194015000000	449662400000	498027600000	12.5	11.65	11.7
2000	4582127300000	461608500000	239450900000	12.66	11.66	11.38
2001	4725086000000	579329100000	438696500000	12.67	11.76	11.64
2002	6912381500000	867336500000	321378100000	12.84	11.94	11.51

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2003	8487031600000	984250100000	241688600000	12.93	11.99	11.38
2004	11411066910000	1032741300000	351259900000	13.06	12.01	11.55
2005	14572239120000	1223730000000	519510000000	13.16	12.09	11.72
2006	18564594730000	1485198200000	720768300000	13.27	12.17	11.86
2007	20657317670000	1589300000000	759281500000	13.32	12.2	11.88
2008	24296329290000	2117389000000	960890100000	13.39	12.33	11.98
2009	24712669900000	2127971500000	1152800000000	13.39	12.33	12.06
2010	33984773000000	3109378510000	883870000000	13.53	12.49	11.95
2011	37409862000000	3314513330000	918500000000	13.57	12.52	11.96
2012	40544052000000	3325178000000	874800000000	13.61	12.52	11.94
2013	42396846000000	3689148100000	1108377000000	13.63	12.57	12.04

SOURCE: CENTRAL BANK OF NIGERIA STATISTICAL BULLETINS

GROSS DOMESTIC PRODUCT (GDP), TOTAL GOVERNMENT RECURRENT EXPENDITURE (GREX) AND TOTAL GOVERNMENT CAPITAL EXPENDITURE (GCEX) IN NAIRA (~~₦~~)

YEARS	GDP	GREX	GCEX
1970	5281100000	715200000	187800000
1971	6650900000	823600000	173600000
1972	7187500000	1012300000	451300000
1973	8630500000	963500000	565700000
1974	8823100000	1517100000	1223500000
1975	21475200000	2734900000	3207700000
1976	26655800000	3815400000	3786600000
1977	31520300000	3819200000	5004600000
1978	34540100000	2800000000	5200000000
1979	41974700000	3187200000	4219500000
1980	49632300000	4805200000	10163400000
1981	47619700000	4846700000	6567000000
1982	49069300000	4885700000	6420200000
1983	53107400000	5278800000	4885700000
1984	59622500000	5827500000	4100100000
1985	67908600000	7576200000	5464700000
1986	69147000000	7696900000	8526800000
1987	105222800000	15646200000	6372500000
1988	139085300000	19409400000	8340100000
1989	216797500000	25994200000	15034100000
1990	267550000000	36219600000	24047800000
1991	312139700000	38243500000	28340900000

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1992	532613800000	54072200000	39763600000
1993	683869800000	82143600000	54501800000
1994	899863200000	85918900000	70918300000
1995	1933211600000	132899700000	121138300000
1996	2702719100000	124291300000	158678300000
1997	2801972600000	158563500000	269652500000
1998	2708430900000	178097800000	309015600000
1999	3194015000000	449662400000	498027600000
2000	4582127300000	461608500000	239450900000
2001	4725086000000	579329100000	438696500000
2002	6912381500000	867336500000	321378100000
2003	8487031600000	984250100000	241688600000
2004	11411066910000	1032741300000	351259900000
2005	14572239120000	1223730000000	519510000000
2006	18564594730000	1485198200000	720768300000
2007	20657317670000	1589300000000	759281500000
2008	24296329290000	2117389000000	960890100000
2009	24712669900000	2127971500000	1152800000000
2010	33984773000000	3109378510000	883870000000
2011	37409862000000	3314513330000	918500000000
2012	40544052000000	3325178000000	874800000000
2013	42396846000000	3689148100000	1108377000000

SOURCE: CENTRAL BANK OF NIGERIA STATISTICAL BULLETINS