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IMPACT OF PUBLIC SECTOR CAPITAL EXPENDITURE ON ECONOMIC DEVELOPMENT IN NIGERIA (2000 – 2020)

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Key Words: Public Sector, Capital Expenditure, Economic Development, Industrial Production, Public Capital Expenditure and Unemployment Reduction.

Abstract

This work focuses on the impact of public sector capital expenditure on the economic development in Nigeria (2000 - 2020). The study was carried out to determine the relationship between government expenditure and Nigeria economic growth and stability. This was informed because of the constant increase in government responsibility and the need to enhance capital project in the country. Three research objectives, three research questions and three hypotheses were raised and used. Expo-facto research design was employed and only secondary data (through CBN statistical bulletin and Nigeria bureau of statistics) were sourced and used. The data collected were presented in tables and analyzed using regression statistics and graph. The findings revealed that there is no correlation between industrial production and federal government capital expenditure, and there is no relationship between public capital expenditure and unemployment reduction in Nigeria. Based on the findings, it was recommended that the Nigerian government should enhance public sector capital expenditure and reduce the rate of recurrent expenditure so as to achieve economic development in Nigeria.

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Introduction

The goal of government is to enhance economic development in the country. One of the strategies to which the government enhances economic development is through capital expenditure. According to Nnamocha (2012), if the public sector must achieve its development goals, it must continue to invest in capital projects. In view of Anyanwu (2018) Public sector entails the part of the economy concerned with provision of basic government services. The public sector might provide services that non-payer cannot be excluded from (such as street lighting), services which benefit all of society rather than just the individual who uses the service (such as public education), and services that encourage equal opportunity. Despite the increasing level of privatization around the world, the public sector in the developing countries still continues to play a great role in capital development of developing countries, especially Nigeria (Oni, 2018). Traditionally, the public sector in developing economies has been in the forefront of economic development (Chude and Chude, 2013).

As a result of the strategic importance of the public sector in the economic and capital development of many countries, there is a concerted effort to make public sector management respond to the changing needs of developing nation (Ugwu, 2020). It should be noted here that the expenses on capital project were roads, airports, education, electricity generation, health and other government capital investment are generally referred to as capital expenditure (Ubah, 2020). Here, capital expenditure is basically on infrastructural facilities used for poverty reduction in the society. Here, capital expenditure is basically on infrastructural facilities like electricity, road network, railway, building of educational and health sector facilities/amenities and other aspects of capital investments. The aim is to enhance the economic development of the country in all ramification. The relationship between government expenditure and economic growth has continued to generate series of debate among scholars. Some scholars argued that increase in government capital expenditure on socio-economic and physical infrastructure encourages economic growth. For instance, government expenditure on health and education raises the productivity of labour and increase the growth of national output.

But a number of prominent authors especially of the neoclassical school argue that increased government capital expenditure may slow down the aggregate performance of the economy because in an attempt to finance raising expenditure, government may have to increase taxes and or borrowing. Hemming (2021) asserted that the major income tax may discourage or may be a disincentive to additional work which in turn may reduce income and aggregate demand. In the same manner, high corporate tax leads to increase in production cost and reduce profitability of firms. On the other hand, increased government borrowing (internal or external) required to finance its expenditure may compete and crowds-out private sector and this reduce private investment in the economy. According to the Revenue Mobilization Allocation and Fiscal Commission – RMF

(2020), the federal government of Nigeria spends 52.2% of total government revenues. The remaining revenues are shared among the federating states and local government areas (LGAs) on the basis of detailed sharing formula. The level of increased of government revenue from oil revenue and non-oil revenues including borrowing from internal and external sources has significantly affected the level of government expenditure in Nigeria over the years.

STATEMENT OF THE PROBLEM

In Nigeria, the government capital expenditure has continued to rise due to receipts from oil revenue (petroleum profit tax and royalties) and non oil revenue (company income tax, custom and excise duties, value added tax (VAT) and others) (CBN Statistical Bulletin, 2020). For that, there has been increased demand for public (utilities) goods like roads, communication, power, education and health. Furthermore, the various components of capital expenditure (that is defense, agriculture, transport and communication, education and health) also show a rising trend in Nigeria. Unfortunately, rising government expenditure has not translated to meaningful growth and development, as Nigeria ranks among the poorest countries of the world. In addition, many Nigerians have continued to wallow in abject poverty while more than 60.9% of over 163 million population are very poor.

The business day newspaper of Tuesday 14th November, 2020 reported that the percentage of Nigerians living in abject poverty – those who cannot afford the very essentials like food, shelter and clothing – rose to 60.9& in 2018 as compared to 54.7% in 2014. Although the Nigerian economy is projected to be growing, poverty is likely to get worse as the gap between the rich and the poor continues to widen. Couple with this, dilapidated infrastructure (especially roads and power supply) that has led to the collapse of many industries, including high level of unemployment. Moreover, macroeconomic indicators like balance of payment, imports obligations, inflation rates, exchange rate and national saving reveal that Nigeria has not fared well in the last couple of decades (Ubah, 2020). Given the issues raised above, this research seeks to examine impact of public sector capital expenditure on economic development of Nigeria (2000-2020).

OBJECTIVE OF THE STUDY

The general objective of this study is to determine the impact of public sector capital expenditure on economic development of Nigeria (2000-2020). The specific objectives include:

1. To determine the relationship between government capital expenditure and gross domestic product (GDP) in Nigeria.
2. The find out the impact of public expenditure (capital) on the level of unemployment in Nigeria.

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3. To find out the impact of public capital expenditure on the level of industrialization in the Nigeria economy.

RESEARCH QUESTIONS

In view of the above objective, the following research question guided the study:

1. Is there any significant relationship between government capital expenditure and gross domestic product (GDP) in Nigeria?
2. What is the impact of public expenditure (capital) on the level of unemployment in Nigeria?
3. What are the impacts of public capital expenditure on the level of industrialization in the Nigeria economy?

RESEARCH HYPOTHESES

In line with our research question, the following hypotheses guided the study. Only null hypothesis was used.

Ho1: There is no significant relationship between government capital expenditure and gross domestic product (GDP) in Nigeria.

Ho2: There is no significant impact of public expenditure (capital) on the level of unemployment in Nigeria.

Ho3: There is no significant impact of public capital expenditure on the level of industrialization in the Nigeria economy.

CONCEPTUAL REVIEW

Public Expenditure

The government of any country performs numerous functions. For Ubah (2020), the functions cover areas of security of lives and properties, infrastructure, and social services. Therefore, all government expenditure is are called public expenditure, because they expenditure service public purposes and aimed at making the society a batter place. Public expenditure according to Ugwu (2020) is the financial expenditure of government or its public sector organizations. Public expenditure is the expenses which government incurs for the maintenance of the government and the society in general (Oriakhi, 2004). Government expenditure is the expenses the government incurs in carrying out its programmes (Okoh, 2018). Government expenditure is identified by economists as a way of contracting or expanding a nation's economy. Increased government spending will in turn expand the economy through increased economic activities while lowering government spending contracts the economy through reducing inflationary gap which as well is capable of reducing economic activities or output (Rosoui, 2015).In recent years, the Nigerian government has engaged in more expenditure in order to stimulate growth of the economy.

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According to Anyanwu (2018), government expenditure involves all the expenses which the public sector incurs for its maintenance for the benefit of the economy. Generally, government expenditure in Nigeria can be categorized into two components parts namely capital expenditure and recurrent expenditure. For Taiwo and Taiwo (2011), capital expenditure is incurred on the creation or acquisition of fixed assets (new or secondhand) while recurrent expenditure is incurred on the purchase of goods and services, payment of wages and salaries and settlement on socio-economic activities. Public expenditure refers broadly to expenditure made by local, state and national government agencies as distinct from those of private individuals. Public Expenditure also comprises of government payments for the goods and services acquired and for the works done pursuant to their respective laws, social security contributions, interest payments of domestic and foreign debts, general borrowing expenditures, payments resulting from the discounted sale of borrowing instruments, economic, financial and social transfers, donations and grants, and others (Loto, 2011). The focus of this study is on capital expenditure.

Capital Expenditure

Capital expenditure is the expenditure in capital projects (Musaba et al, 2013). The need to improve the infrastructural living condition of people of every nation is a key priority of every government. This can be achieved through increase in government expenditure from the capital angle. This enables the government to have at its disposal enough fund to finance its capital expenditures, which will be accompanied by increase in economic output of the nation. For Okoh (2018), capital expenditure covers government expenditure on road, electricity, rail way, building structures, and other aspects of infrastructural development. Capital expenditure is expenditure in road, airports, education, electricity, health and other government investments. It is focused on expenditure meat to enhance the condition of the people and to encourage private investment. Here, investment or expenditure on roads, electricity etc will impact positively on people. Capital expenditure deals with accruing physical or tangible goods such as building infrastructures, accruing machines and so on (Darma, 2014). Although, research evidence shows that even with rapid increase in both capital and recurrent expenditures, the economy has remained stagnant or moved in a sluggish manner (Modebe, Okafor, Omoumere & Ibe, 2012).Wagner (1883) posited in his theory of public expenditure that government spending results to economic growth while Keynes (1936) also posits that growth cannot occur without government expenditure. Smith (1776) in his Wealth of Nations argues that government should focus on critical sectors of the economy such as defense, health and public (infrastructural) development, expenses made to other sectors aside from those he pointed out were regarded as a wastage.

In recent times, the Nigerian government has invested tremendous amount in capital expenditure due to infrastructural deficiency as identified by policy makers as one of the

reasons why the nation's economy has not received massive investments from investors both within and outside the country. Barro (2010) indigenized state spending in a growth model and examined the relationship between the size of a government and rates of savings and economic growth. His submission was that increase in funds which are made to non-productive government services is related to low per capita growth and therefore concluded that for state expenditure to enhance growth, it has to tend towards productive services. Over time, government capital expenditure has been unstable, rising and dropping. In 1894, the amount spent on capital projects was 4.10 billion while it increased to 24.05 billion in ₦1990. During this period, the highest level of economic growth was in 1990 when there was a growth of 12.8 percent. From 1991 till date, capital expenditure has been on a constant rise from 28.34 billion in 1991, 121.14 billion in 1995, 552.39 billion in 2006 and ₦1,152.80 billion in 2009 after which it became fairly unstable with rise and fall until 2017 when it was at 979.50 billion (CBN, 2017). However during this period, the increase in capital spending did not reflect much on the economy as even in 2009 when the highest amount was observed, there was only a growth rate of 6.9 percent in the economy. Previous studies such as Nurudeen and Usman (2010); Modebe, Okafor, Onwumere and Ibe (2012) among others examined the impacts of capital expenditure alongside recurrent expenditure thereby not really been able to separate the effects of both types of spending.

Economic Development

Economic development is defined as "the process whereby the real per capita income of a country increases over a long period of time (Conchesta, 2018). Economic development is measured by the increase in the amount of goods and services produced in a country. A growing economy produces more goods and services in each successive time period. Thus, development occurs when an economy's productive capacity increases which in turn, is used to produce more goods and services. A growing economy is a changing economy. Here, development does not appear to make us any happier once we have reached a certain standard of living. As such, economic development in its wider aspect implies raising the standard of living of the people and reducing inequalities of income distribution. According to Ayadi and Ayadi (2008), economic development which is always proxied by GDP often conceptualized as increase in output of an economy's capacity to produce goods and services needed to improve the welfare of the country's citizens. Development is seen as a steady process which involves raising the level of output of goods and services in the economy.

Development is meaningful when the rate of growth is much higher than population growth because it has to lead to improvement in human welfare. Therefore, development is seen as a steady process of increasing the productive capacity of the economy and hence of increasing national income, being characterized by higher rates of increase of per capita output and total factor productivity, especially labour productivity. According

to Hemming (2019) though economic development is associated with an increase in capital per head, capital is not the only requirement for growth. Thus, if capital is made available without, at the same time, providing a framework for its use, it will be wasted. Development is influenced by the composition of expenditure, since certain types of spending have more effects on growth. Essential among these types of spending are provision of socio-economic infrastructure, operations and maintenance, and general administrative and legal frameworks. Arguing in the same vein, Ogiogio (2005) emphasized that adequate funding of public sector recurrent budget makes for an effective and functional civil service, and hence, the effectiveness of implementation of development policies and programmes. Development growth is the quantitative increase in the monetary value of goods and services produced in an economy within a given year. Economic development is measured as a percentage change in the Gross Domestic Product or Gross National Product (Dwivedi, 2014).

As analyzed by Hemming (2011), even apparently less productive expenditure, security, for example, provides social and political stability that is necessary for growth, and reducing such spending could be counter-productive. The main conclusions that can, therefore, be derived from these studies are that, public expenditure contributes to growth, and that composition rather than the level which is important. According to Dwivedi (2014), economic development on the other hand is a sustained increase in per capita national output or net national product over a long period of time. It implies that the rate on increase in total output must be greater than the rate of population growth. Another quantification of economic growth is that national output should be composed of such goods and services which satisfy the maximum want of the maximum number of people.

The Impact of Capital Expenditure on Nigeria Economic Development

In view of Ranjan and Sharma (2018), it is a common believe that government plays a significant role in the development of a country and public expenditure (capital) is an important instrument for a government to control the economy. Economists have been well aware of its effects in promoting economic growth. The general view is that public expenditure (capital expenditure) notably on social and economic infrastructure can be growth-enhancing. That is an increase in government expenditure will yield a positive increase in the growth of the economy by increasing the national income, especially when it is injected in development programmes (Omoke, 2009). For example, government expenditure on health and education is capable of raising the productivity of labour and increase the growth of national output (Oni, 2018). Similarly, expenditure on infrastructure such as roads, communications, power, etc. reduces production costs, increase private sector investment and profitability of firms, thus fostering economic growth.

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However, some scholars did not support the claim that increasing government expenditure promotes economic growth, instead they assert that higher government expenditure may slowdown overall performance of the economy (Nwaeze et al, 2014). For instance, in an attempt to finance rising expenditure, government may increase taxes and/or borrowing. Higher income tax discourages individuals from working for long or even searching for jobs. This in turn reduces income and aggregate demand. In the same vein, higher profit tax tends to increase production costs and reduce investment expenditure as well as profitability of firms. But in Keyesian's view, government expenditure boost economic growth, particularly in times by Olukayode (2009) that public expenditure either recurrent or capital expenditure, notably on social and economic infrastructure can be growth – enhancing.

In view Conchestra (2018), in line with this view, the rising government expenditure in Nigeria as expected to translate into meaningful growth and development but Nigeria still ranks among the poorest countries in the world today while many Nigerians have countries to wallow in abject poverty with more than 50 percent living below US & 2 per day and less than 2 percent are abnormally rich. Bad roads and epileptic power supply have led to the collapse of many industries accompanied by high level of unemployment and abandonment of projects. In addition, the macroeconomic indicators such as balance of payments, import obligations, inflation rate, exchange rate, national savings, foreign reserves, debt profile mortality rate are all showing that Nigeria is not doing well economically in the last couple of years (Maku, 2019). With all the aforementioned experiences in Nigeria, this study finds it necessary to re-examine the impact of government capital expenditure on economic growth in Nigeria.

THEORETICAL REVIEW

Some theories relevant for this work were reviewed thus:

The Keynesian Theory

The all economists who discussed the relation between public expenditures and economic growth, Keynes was among the most noted with his apparently contrasting viewpoint on this relation. Keynes regards public expenditure as an exogenous factor which can be utilized as a policy instruments promotes economic growth. From the Keynesian though, public expenditure can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augments the aggregate demand, which provokes an increased output depending on expenditure multipliers (Chude and Chude, 2013).

The Solow's Theory

Rober Solow and T.W. Swan introduce the Solow's model in 1956. Their model is also known as Solow-Swan model or simply Solow model. In Solow's model, other things being equal, saving investment and population growth rates are important determinants of

economic growth. Higher saving/investment rates lead to accumulation of more capital per worker and hence more output per worker. On the other hand, high population growth has a negative effect on economic growth simply because a higher fraction of sawing in economies with high population growth has to go to keep the capital labour ratio constant. In the absence of technological change and innovation, an increase in capital per worker would not be matched by a proportional increase in output per worker because of diminishing returns. Hence, capital deepening would lower the rate of return on capital (Chude and Chude, 2013).

The Endogenous Growth Theory

The basic improvement of endogenous growth over the previous models is that it explicitly tries to model technology (that is, looks into the determinants of technology) rather than assuming it to be exogenous. Mostly, economic growth comes from technological progress, which is essentially the ability of an economic organization to utilize its productive resources more effectively over time. Much of this ability comes from the process of learning to operate newly created production facilities in a more productive way or more generally from learning to cope with rapid changes in the structure of production which industrial progress must imply (Verback, 2000). Series data from 1975 to 2004 and observed that public expenditure impacted positively on economic growth and that there was no link between gross fixed capital formation and gross domestic product. He argued that from disaggregated analysis, the result that only 37.1% of government expenditure is devoted to capital expenditure while 62.9% share is to current expenditure.

Usman et al (2011) assess how fiscal and monetary policies influence economic growth and development. The essence of their study was to determine the components of government expenditure that enhance growth and development, identify those that do not and recommend those that should be cut or reduce to the barest minimum. The study employs an analytic framework based on economic models, statistical methods encompassing trends analysis and simple regression. They find no significant relationship between most of the components of expenditure and economic growth. Abu and Abdullah (2010) investigate the relationship between government expenditure and economic growth in Nigeria from the period ranging from 1970 to 2008. They used disaggregate analysis in an attempt to unravel the impact of government expenditure on economic growth. Their results revealed that government total capital expenditure, total recurrent expenditure and education have negative effect on economic growth. On the contrary, government expenditure on transport, communication and health result in an increase in economic growth. The recommend that government should increase both capital expenditure and recurrent expenditure including expenditure on education as well as ensure that funds meant for development should encourage and increase the funding

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of anti-corruption agencies in order to tackle the high level of corruption found in public offices in Nigeria.

Musgrave Theory of Public Expenditure Growth

This theory was propounded by Musgrave. He posits that at low levels of per capital income, demand for public services tends to be very low. This is so because according to him, such income is devoted to satisfying primary needs and that when per capita income starts to rise above these levels of low income, the demand for services supplied by the public sector such as health, education and transport start to rise4, thereby forcing government to increase expenditure on them. He observes that at the high levels of per capita income, typical of developed economics, the rate of public sector growth tends to fall as the more basic wants are being satisfied (Chude and Chude, 2013).

The Wagner's Theory of Increasing State Activities

Wagner's theory is a principle named after the German economist Adolph Wagner (1835-1917). Wagner advanced his "law of rising public expenditures" by analyzing trends in the growth of public expenditure and in the size of public sector. Wagner's law postulates that:

1. The extension of the functions of the states leads to an increase in public expenditure on administration and regulation of the economy.
2. The development of modern industrial society would give rise to increasing political pressure for social progress and call for increased allowance for social consideration in the conduct of industry.
3. The rise in public expenditure will be more than proportional increase in the

EMPIRICAL REVIEW

Some studies have been done in related areas of this work.

Aiyedogbon et al (2015) studied growth of government expenditure. They used the ARDL model. Their results shows that while the impact of government expenditure on administration and debt servicing were positive on economic growth in the long and short run, expenditure on economic and social sectors has negative impact. They argued that this may not be unconnected with the high level of corruption prevalent in the public sector where funds that are meant for provision or maintenance of social-economic activities like agriculture, roads, transportations, schools and hospitals are diverted for personal use. The CUSUM and CUSUMSQ test shown in their model is stable as neither of them cross the 5% boundary.

Oliaya et al (2020) in their study examined the causal relationships among economic growth, government expenditure and inflation rate in Nigeria over the period 1970 to 2010. Their study utilized both the Augmented Dickey-Fuller (ADF) and the Philip Perron tests to examine the properties of the variables. It was observed that the variables were

found to be stationary, though not in their level form but in their first difference. In addition, the Johansen and Juselius (JJ) co-integration technique indicated the presence of co-integration among the variables while the tri-variate vector error correction model (VECM) showed the presence of bi-directional causality between government expenditures and economic growth both in the short run and in the long run. Also, it was revealed that in the short run a unidirectional causality existed from economic growth and government expenditure to inflation rate while no feedback from inflation rate was observed.

Ghani and Din (2016) accessed impact of public investments on economic growth in Pakistan. The variables employed in their study were public investment, private investment, public consumption and GDP for the period of 1973-2004. Employing VAR model on time series data, the study found that growth is largely driven by private investment than public investment as public investment crowds out private investment.

Schaltegger and Torgler (2019) examined the growth effect of public expenditure at the state and local levels in Switzerland from 1981 to 2017. The study found that impact of public expenditure on economic growth is negative. Musaba et al (2013) investigated the impact of government sectoral expenditure on economic growth in Malawi. Employing co-integration and error correction model on a data set of 1980-2017, he found that in the short run there was no significant relationship between government sectoral expenditure and economic growth. On the other hand, the long run results showed significant positive effect of agriculture and defence expenditure on economic growth. The expenditures on education, health, social protection and transportation and communication were negatively related to economic growth.

Okoro (2013) investigated the impact of government spending on economic growth for the sample data of 1980- 2011. He employed Johansen co-integration test, ordinary least square (OLS) multiple regression technique, error correction model and causality test and found long-run equilibrium relationship between government spending and economic growth in Nigeria. Also, the short-run dynamics adjusts to the long-run equilibrium at the rate of 60 percent per annum which means that both the short-run and long-run expenditure has significant effect on economic growth. Finally, he found unidirectional causality running from government expenditure to economic growth. Usman et al (2011) investigated on the effect of government expenditure on economic growth in Nigeria spanning the period 1970-2008. An augmented Solow model is specified in Cobb-Douglas form with public capital as one of the factors. The study decomposed expenditure into three expenditure streams namely public expenditure on education and health, public expenditure on transport and communication and public expenditure on administration. They found that in long run, there is relationship between public expenditure and growth while in the short run, public spending has no impact on growth.

Ohwofasa et al (2012) scrutinized the relationship between government expenditure in education sector and economic growth in Nigeria using time series data spanning 1986 to

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2011. Their study employed Johansen co-integration technique and error correction method and found that long run relationship existed between the variables. Also, results further indicated that a one year lag of gross domestic product, current level of recurrent expenditure on education, two years lags of recurrent expenditure on education, current as well as two years lags of gross capital formation exhibit positive impact on economic growth in Nigeria. On the other hand, previous year capital expenditure on education and human capital development has negative and significant impact on economic growth within the period of study.

Maku (2019) examined the link between government spending and economic growth in Nigeria over the last three decades (1977-2006) using time series data to analyze the Ram (2016) model. Three variants of Ram (2016) model were developed-regressing Real GDP on private investment, human capital investment, government investment and consumption spending at absolute levels, regressing it as a share of real output and regressing the growth rate real output to the explanatory variable as share of real GDP. His result showed that private and public investments have insignificant effect on economic growth during the review period. An attempt to test for presence of stationary using Augmented Dickey Fuller (ADF) unit root test reveals that all variables incorporated in the model were non-stationary at their levels. In an attempt to establish long run relationship between public expenditure and economic growth, the result reveals that the variables are co-integrated at 5% and 10% critical level. With the use of error correction model to detect short run behaviour of the variables, the result showed that for any distortion in the short-run, the error term restores the relationship back to its original equilibrium by a unit.

Oluwatobi and Ogunrinola (2011) examined the impact of government recurrent and capital expenditures on education and health and their effect on economic growth in Nigeria. The study adopted the augmented Solow model and real output as dependent variable while the explanatory variables are government capital and recurrent expenditures on education and health, gross fixed capital formation and the labour force. The result found that there exists a positive relationship between government recurrent expenditure on human capital development and the level of real output while capital expenditure is negatively related to the level of real output.

Oni (2018) assessed the impact of health expenditure on growth in Nigeria by employing multiple regression technique. The founding showed that total health expenditure, gross capital formation and labour force productivity are important determinants of economic growth in Nigeria while life expectancy impacted negatively. He observed that increase in health expenditure has raised the level of national income by enhancing the marginal productivity of labour. In a related study,

Nwaeze et al (2014) examined the nature and impact of Federal Government Expenditure on Nigeria's economic growth for the period 1992 – 2011. Time series data for the twenty year period were sourced from secondary sources and Ordinary Least Square (OLS)

multiple regression technique was used to estimate the hypothesis formulated in line with the objectives of their study. Real Gross Domestic Product, proxy for economic growth is adopted as the dependent variable while Total Recurrent Expenditure and Total Capital Expenditure constitute the independent variables. The result of their study shows that the Federal Government Expenditure has a positive and insignificant impact on the economic growth of Nigeria for the period under study. In view of this, they recommended amongst others that government should allocate more of its resources to the priority sectors of the economy such as agriculture and industry as well as to infrastructural development, in order to encourage growth of the economy.

Ighodaro and Okiakhi (2010) used time series data for the period 1961 to 2007 and applied Co integration Test and Granger Causality test to examine government expenditure disaggregated into general administration and community and social services in Nigeria. The results revealed negative impact of government on economic growth. Loto (2011) investigated the impact of sectoral government expenditure on economic growth in Nigeria for the period 1980-2008 and applied Johansen co-integration technique and error correction model. The Government Spending and Economic Growth in Nigeria (1980-2011) results inferred that in the short run expenditures on agricultures and education were negatively related to economic growth. However, expenditures on health, national security, transportation, and communication were positively related to economic growth, though the impacts were not statistically significant. Taiwo and Taiwo (2011) attempted to empirically examine the trends as well as effects of government spending on the growth rates of real GDP in Nigeria over the last decades (1970-2008) using econometrics model with Ordinary Least Square (OLS) technique. Their paper tested for presence of stationary between the variables using Durbin Watson unit root test. Their result reveals absence of serial correlation and that all variables incorporated in the model were non-stationary at their levels. In an attempt to establish long-run relationship between public expenditure and economic growth, the result reveals that the variables are co-integrated at 5% and 10% critical level. Their findings showed that there that was a positive relationship between real GDP as against the recurrent and capital expenditure. They recommended that government should promote efficiency in the allocation of development resources through emphasis on private sector participation and privatization\commercialization.

Abu and Abdullah (2010) investigated on the relationship between government expenditure and economic growth in Nigeria from the period ranging from 1970 to 2008.They used disaggregated analysis in an attempt to unravel the impact of government expenditure on economic growth. Their results reveal that government total capital expenditure, total recurrent expenditure and education have negative effect on economic growth. On the contrary, government expenditure on transport, communication and health result in an increase in economic growth. They recommend that government should increase both capital expenditure and recurrent expenditure

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including expenditure on education as well as ensure that funds meant for development on these sectors are properly utilized. They also recommend that government should encourage and increase the funding of anti-corruption agencies in order to tackle the high level of corruption found in public offices in Nigeria.

From other studies, Belgrave and Craigwell (2015) examined the impact of government expenditure on economic growth disaggregating the level of government expenditure on economic growth into functional and economic categories of Barbados for the period 1969-1992 and employed Augmented Dickey Fuller and Engle and Granger co-integration technique. Their results revealed that there is a positive relationship between capital expenditure, agriculture, housing and community, road, communication and health expenditure on economic growth respectively. However, the effects of education and recurrent expenditure are negative.

Niloy, Emranhul and Osborn (2013) used a disaggregated approach to investigate the impact of public expenditure on economic growth for 30 developing countries in 1970s and 1980s. The authors confirmed that government capital expenditure in GDP has a significant positive association with economic growth, but the share of government recurrent expenditure in GDP was shown to be insignificant in explaining economic growth. At the sectoral level, government investment and expenditure on education are the only variables that had significant effect on economic growth especially when budget constraint and omitted variables are included.

In India, Ranjan and Sharma (2018) examined the effect of government development expenditure on economic growth during the period 1950-2007. They discovered a significant positive impact of government expenditure on economic growth. They also reported the existence of co-integration among the variables. Finally, Donald and Shuanglin (2013) investigated the differential effects of various forms of expenditures on economic growth for a sample of 58 countries. Their findings indicated that government expenditure on education and defense has positive influence on economic growth, while expenditure on welfare has insignificant negative impact on economic growth. Gregarious and Ghosh (2013) made use of the heterogeneous panel data to study the impact of government expenditure on economic growth. Their results suggest that countries with large government expenditure tend to experience higher economic growth.

RESEARCH GAP

Some related studies have been covered by past researches. However, research gap exist on the subject matter (the impact of public sector capital expenditure on economic development of Nigeria (2000-2020)), geographical location, year covered and indices in the objectives.

a. **On the subject matter:** This work focused on public sector capital expenditure and economic development of Nigeria. past studies covered only related areas of this

topic as some covered capital expenditure, or recurrent expenditure or even other aspect of expenditure without exact emphasis on both dependent and independent variables.

b. **On the geographical gap:** Some of the past studies covered other countries of the world without any emphasis on Nigeria economy which is the focal point of this work.
c. **On the year of coverage:** This study covered 2000 – 2020, which is the most recent. Most of the past studies covered years far below the above year covered in this work; hence the gap.
d. **Gap on indices:** The indices used in the objectives of this study differs from what were used in most of the past researches. Such indices covered gross domestic product (GDP), unemployment and industrialization. They were mainly lacking from past researches; hence the gap.

RESEARCH METHODOLOGY

In this study, expo-factor research design was adopted. Only secondary data were sourced and used. The technique ordinary least square was adopted in analyzing the data so as to ascertain the relative impact of public capital expenditure on the economic aggregates, the choice of OLS is mainly because is widely used, simple and easy to understand.

Model Specification

Model one: There is no significant relationship between public capital expenditure and the real gross domestic products (RGDP) in Nigeria.

RGDP = (PCE)

$RGDP = b_o + b_1$

Where

b_o = regression constant
b_1 = regression intercept
RGDP = real gross domestic product
PCE = public capital expenditure
U = error term

Model two: There is no significant impact of public capital expenditure on the level of unemployment in Nigeria.

UNEMPLOY = F (PCE)

$UNEMPLOY = b_o + b_1 (CPE) + U$

Where

UNEMPLOY = unemployment rate

Model three: There is no significant impact of public expenditure on the level of industrialization in Nigeria.

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IND = F(PCE) + U

IND = $b_o + b_1 (PCE) + U$

Where

IND = level of industrialization

Computer Software used for Analysis

This study made use of Microsoft excel and e views (which design)

Regression Analysis

In analyzing the data using simple regression, the following as specified below will be applied. The true relationship for X and Y is $Y_1 = b_o + b_1 + X_1$

The estimated value of Y given the specified value of X:

b_o = estimated true intercept (b_o)

b_1 = estimated true faramenter (b_1)

e = estimated true value of random term "U"

Normal equation for b_o are as follows:

$$Bo = \frac{\sum x^2 \sum y - \sum x \sum xy}{n\sum x^2 - (\sum x)^2}$$

$$B1 = \frac{n\sum x^2 - \sum x \sum y}{n\sum x^2 - (\sum x)^2}$$

Where n = number of samples under observation X and Y remain as previously defined.

The Correlation Co-Efficient (r)

Here, we try to determine the correlation between the dependence and independent variables. The correlation co-efficient is defined by the formular:

$$r = \frac{\sum XiYi}{\sqrt{\sum Xi^2 \sqrt{\sum Yi2}}}$$

Co-Efficient of Determination (R^2)

The co-efficient of determination denoted by R^2 is a measure of extent to which variation in the dependent variable (Y) is explained by the variations in the dependent variable (X). It is a measure of goodness of fit. It is denoted by the formular:

$$R^2 = \frac{b_1 \sum xy}{\sum Y^2}$$

Adjusted Co-Efficient of the Determination R^{-2}

This is used to adjust the defect of R^2 by taking into account the degree of freedom which clearly decreases as new regressions are introduced in the functions (Koutspyianus, 2006:129).

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TEST OF HYPOTHESIS

The statistics (T-test in using the t-test reference is made to the degree of freedom (n-1k) at a chosen level of significance (50%). If t' (cal) > t (tab), we reject the null hypothesis (Ho) and conclude that b_1 is statistically significant.

F Statistics (F-Ratio)

The f-statistics, otherwise known as the analysis of various (ANOVA) test, is used to test the overall significance of the regression equation that is, whether the independent variable significantly affect the dependent variable or not, it is given by

$$F^x \text{ or } Fcal = \frac{R^2/k-1}{(1-R^2)/N-k}$$

Where

K = number of b's (including the intercept b_o)

N = number of observation in the sample

If F^xcal > Ftab, we reject the null hypothesis and conclude that the parameters are significant.

Durbin-Watson Statistics (Dew test)

The dew test is used to detect the presence of berial correction in a regression equation. In conclusion, this chapter deals extensively on the methodology we adopted.

DATA PRESENTATION

Table 1: Table of Federal Government Capital Expenditure, GDP at current basic prices, Industrial Production Index and unemployment rate 2000 to 2020.

Year	Federal Government Capital Expenditure Nb	GDP at current basic pricesNb	Industrial Production Index	Unemployment rate
2000	54.5018	1089.68	131.7	3.4
2001	70.9183	1399.703	129.2	3.2
2002	121.1383	2907.358	128.8	1.9
2003	212.9263	4032.3	132.5	2.8
2004	269.6517	4189.25	140.6	3.4
2005	309.0156	3989.45	133.9	3.5
2006	498.0276	4679.212	129.1	17.5
2007	239.4509	6713.575	138.9	13.1
2008	438.6965	6895.198	144.1	13.6
2009	321.3781	7795.758	145.2	12.6
2010	241.6883	9913.518	147	14.8

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2011	351.25	11411.07	151.2	13.4
2012	519.47	14610.88	121.6	11.9
2013	552.3858	18564.59	120.8	13.7
2014	759.2812	20657.32	119.4	14.6
2015	960.8901	24296.33	117.8	14.9
2016	1152.797	24794.24	118.2	19.7
2017	883.8745	33984.75	121.5	21.4
2018	918.5489	37409.86	132	23.9
2019	874.84	40544.1	136.7	25.7
2020	1108.386	42396.77	138.2	10.6

Source: Central bank of Nigeria annual reports, Nigeria Bureau of Statistics

Descriptive Analysis: Graph

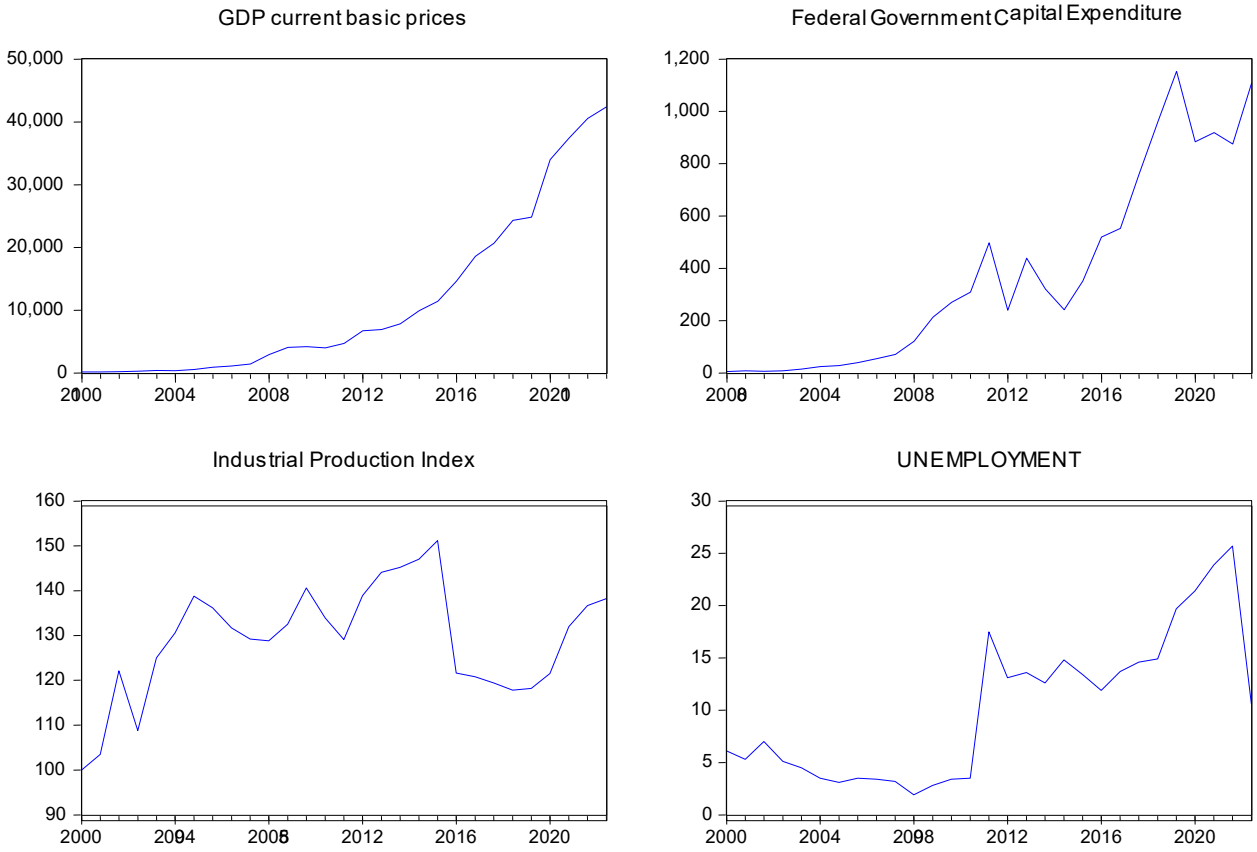

Figure 1: Graph of Federal Government Capital Expenditure, GDP at current basic prices, Industrial Production Index and unemployment rate 2000 to 2020.

From the above graph, it could be seen that the researcher took 5 years interval for the study. Hence we considered 2001, to 2007, to 2012 and to 2017. Not only that, from the

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first graph (which is on GDP current basic. But, real improvement was between 2012 till more than 2017 (which is 2020). The improvement reached 30, 000 in 2017 and gets to 40,000 in 2013.

On the second graph (which gave data on federal government capital expenditure). But, there was improvement in 2002 as against the previous years. Also, real growth was achieved in 2007 and after 2002, but after 2012, real growth was achieved till 2017 (which is the highest so far) but decline was observed around 2018 and another growth in 2020.

On the third graph (which is on industrial production), 2007-2013 saw the highest growth, and 2014-2017 witnessed some declined. Also, industrial improvement and stability was in progress between 2002 to 2007. There was an improvement also after 2017. But, unemployment rate in Nigeria grow high from 2007 till date.

Table 2: Result of estimated equation

Dependent Variable:
GDP_CURRENT_BASIC_PRICES
Method: Least Squares
Date: 22/11/2020 Time: 10:58
Sample: 2000 2020
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FEDERAL_GOVERNMENT_CAPIT	33.20670	2.645529	12.55201	0.0000
C	-1378.468	1393.409	-0.989277	0.3313
R-squared	0.853701	Mean dependent var		11211.46
Adjusted R-squared	0.848282	S.D. dependent var		13372.46
S.E. of regression	5208.705	Akaike info criterion		20.02052
Sum squared resid	7.33E+08	Schwarz criterion		20.11482
Log likelihood	-288.2976	Hannan-Quinn criter.		20.05005
F-statistic	157.5530	Durbin-Watson stat		1.975970
Prob(F-statistic)	0.000000			

Interpretation of results

Diagnostic Tests

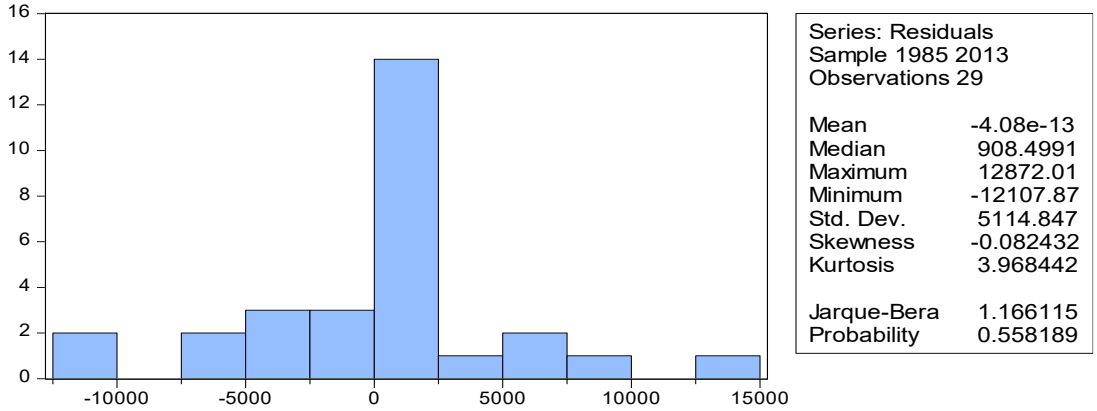

Figure 2: Test Normality results

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Normality Test

The Jarque-Bera statistic and probability show that the residuals of my model are normally distributed (see figure 4.2 above). Also from table 4.3 below, the result of the Breusch-Godfrey Serial Correlation LM Test indicate that there is no serial correlation in the estimated model.

Table 3: Result of Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.077674	Prob. F(2,25)	0.3293
Obs*R-squared	7.133241	Prob. Chi-Square(2)	0.5283

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 22/11/2020 Time: 11:00
Sample: 2000 2020
Included observations: 29
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FEDERAL_GOVERNMENT_CAPIT	-0.383256	2.416740	-0.158584	0.8753
C	252.7516	1260.566	0.200506	0.8427
RESID(-1)	0.524450	0.201095	2.607966	0.0151
RESID(-2)	-0.027175	0.234963	-0.115657	0.9088
R-squared	0.245974	Mean dependent var		-4.08E-13
Adjusted R-squared	0.155491	S.D. dependent var		5114.847
S.E. of regression	4700.400	Akaike info criterion		19.87613
Sum squared resid	5.52E+08	Schwarz criterion		20.06472
Log likelihood	-284.2038	Hannan-Quinn criter.		19.93519
F-statistic	2.718449	Durbin-Watson stat		1.995001
Prob(F-statistic)	0.065972			

Table 4: Dependent Variable: INDUSTRIAL_PRODUCTION_IN

Method: Least Squares
Date: 22/11/2020 Time: 11:02
Sample: 2000 2020
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOVERNMENT_CAPITEXP	2.893652	1.264071	2.289153	0.0301
C	114.5263	6.715724	17.05345	0.0000
R-squared	0.662537	Mean dependent var		129.0828
Adjusted R-squared	0.631520	S.D. dependent var		12.48150
S.E. of regression	11.63180	Akaike info criterion		7.811834
Sum squared resid	3653.066	Schwarz criterion		7.906131

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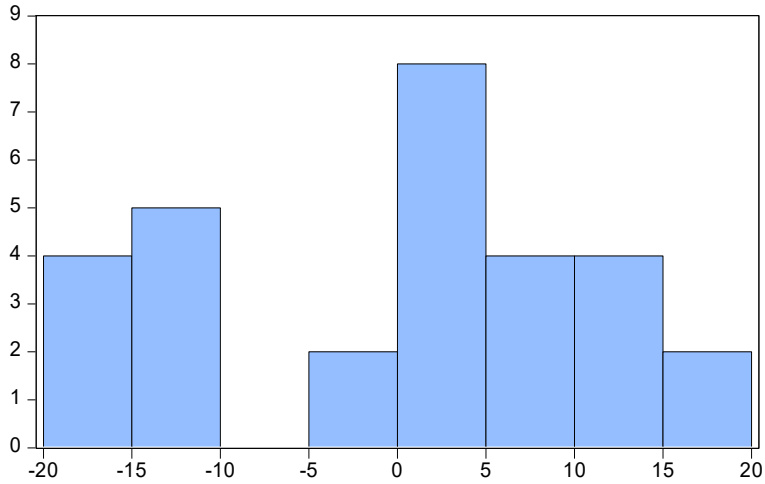
Log likelihood	-111.2716	Hannan-Quinn criter.	7.841367
F-statistic	5.240219	Durbin-Watson stat	1.643960
Prob(F-statistic)	0.030116		



Series: Residuals
Sample 1985 2013
Observations 29

Mean	1.33e-14
Median	2.460998
Maximum	19.71257
Minimum	-19.44061
Std. Dev.	11.42220
Skewness	-0.198254
Kurtosis	1.895398
Jarque-Bera	1.664315
Probability	0.435110

The above table 4.4 shows that there is no correlation between industrial production and the federal government capital expenditure. Here, the Jaraque-Berastatistics and probability shows that our residuals of model are normally distributed (see figure 2.3).

Table 5:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	8.168478	Prob. F(2,25)	0.0019
Obs*R-squared	11.46121	Prob. Chi-Square(2)	0.0032

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 22/11/2020 Time: 11:04

Sample: 2000 2020

Included observations: 29

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOVERNMENT_CAPITEXP	-0.047548	1.022106	-0.046519	0.9633
C	0.302207	5.430982	0.055645	0.9561
RESID(-1)	0.674882	0.199536	3.382264	0.0024
RESID(-2)	-0.076936	0.199813	-0.385038	0.7035
R-squared	0.395214	Mean dependent var		1.33E-14
Adjusted R-squared	0.322640	S.D. dependent var		11.42220
S.E. of regression	9.400686	Akaike info criterion		7.446884
Sum squared resid	2209.322	Schwarz criterion		7.635477

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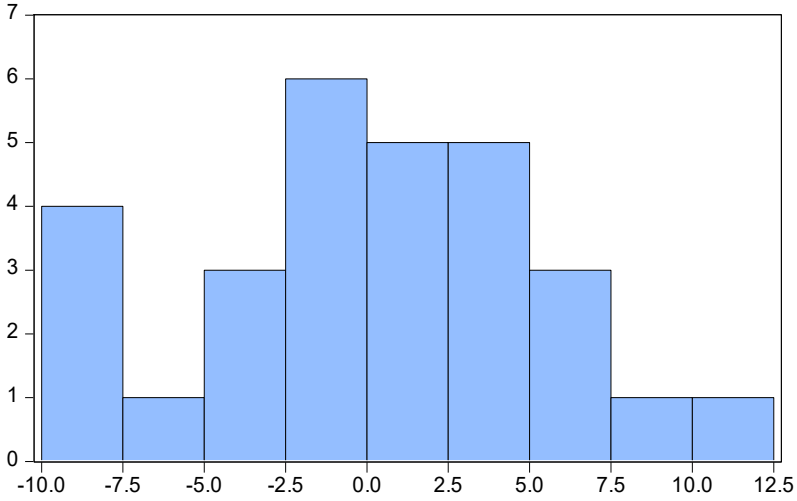
Log likelihood	-103.9798	Hannan-Quinn criter.	7.505949
F-statistic	5.445652	Durbin-Watson stat	1.839857
Prob(F-statistic)	0.005069		

Dependent Variable: UNEMPLOYMENT
Method: Least Squares
Date: 22/11/2020 Time: 11:04
Sample: 2000 2020
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOVERNMENT_CAPITEXP	2.790316	0.557743	5.002873	0.0000
C	-3.771120	2.963161	-1.272668	0.2140

R-squared	0.481056	Mean dependent var	10.26552
Adjusted R-squared	0.461836	S.D. dependent var	6.996033
S.E. of regression	5.132267	Akaike info criterion	6.175444
Sum squared resid	711.1845	Schwarz criterion	6.269740
Log likelihood	-87.54394	Hannan-Quinn criter.	6.204977
F-statistic	25.02873	Durbin-Watson stat	1.721669
Prob(F-statistic)	0.000030		



Series: Residuals
Sample 1985 2013
Observations 29

Mean	0.000000
Median	0.263693
Maximum	10.56941
Minimum	-8.726853
Std. Dev.	5.039786
Skewness	-0.028717
Kurtosis	2.468226
Jarque-Bera	0.345683
Probability	0.841271

It could be seen that the Jaraque-Berastatistics and probability shows that the residuals of our model are based on data in the previous figure.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	7.700771	Prob. F(2,25)	0.5325
Obs*R-squared	11.05514	Prob. Chi-Square(2)	0.4240

Test Equation:
Dependent Variable: RESID
Method: Least Squares

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Date: 22/11/2020 Time: 11:05
Sample: 2000 2020
Included observations: 29
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOVERNMENT_CAPITEXP	-0.015788	0.460887	-0.034256	0.9729
C	-0.069455	2.435701	-0.028515	0.9775
RESID(-1)	0.709637	0.255047	2.782373	0.0101
RESID(-2)	-0.117844	0.280210	-0.420556	0.6777
R-squared	0.381212	Mean dependent var		0.000000
Adjusted R-squared	0.306957	S.D. dependent var		5.039786
S.E. of regression	4.195582	Akaike info criterion		5.833383
Sum squared resid	440.0726	Schwarz criterion		6.021976
Log likelihood	-80.58405	Hannan-Quinn criter.		5.892448
F-statistic	5.133847	Durbin-Watson stat		1.662314
Prob(F-statistic)	0.006647			

DISCUSSION AND INTERPRETATION OF FINDINGS

From the first graph of this chapter, it could be seen that the researcher took 5 years interval for the study. Hence we considered 2002, to 2007, to 2012 and to 2017. Not only that, from the first graph (which is on GDP current basic prices). But, there was little improvement between 2002 and 2007, because the rate of growth is up to 10,000. But real improvement was between 2012 till more than 2010 (which is 2013). The improvement reached 30, 000 in 2010 and gets to 40,000 in 2013. This is in line with the view of Ugwu (2020) who asserted that the level of economic growth in Nigeria during the military era (2000 to 2010 etc.) were not encouraging.

On the second graph (which gave data on federal government capital expenditure), it could be seen that federal government capital expenditure was low between 2000 to 2005. But there was improvement in 1995 as against the previous years. Also, real growth was achieved in 2000 and after 2005, but after 2005, real growth was achieved till 2017 (which is the highest so far) but decline was observed around 2018 and another growth in 2020.

On the third graph (which is on industrial production), 2007-2012 saw the highest growth, and 2013-2017 witnessed some declined. Also, industrial improvement and stability was in progress between 2002 to 2007. There was an improvement also after 2017.

On the fourth graph (which is on unemployment rate), there was low level of unemployment in Nigeria around 2006, hence unemployment growth then was between 0-6%. But unemployment rate in Nigeria grow high from 2000 till date. This is line with view of Ubah (2020) who asserted that the unemployment rate in Nigeria is increasing on daily basis.

The table 4.4 shows that there is no correlation between industrial production and the federal government capital expenditure. This is in line with the belief of Oni (2018),

Onwumere (2019) and Omuke (2021) who asserted that there was high level of industrial liquidation between 2006 to 2017. Also, the Jaraque-Berastatistics and probability shows that our residuals of model are normally distributed. It could be seen that the Jaraque-Berastatistics and probability shows that the residuals of our model are based on data in the previous figure.

CONCLUSION

This study examined the impact of public capital expenditure on the Nigeria economic growth. It should be noted here that public capital expenditure is the government or as institution expenditure in (road, airports, education, electricity, health and other government investment) capital projects. Capital expenditure is expected to encourage local investment in the economy, enhance poverty reduction, improve infrastructural development, lead to unemployment reduction, enhance industrialization and therefore lead to economic development. This study discovered the public capital expenditure has no significant positive impact on the growth of gross domestic products (GDP) of the country, reduction of unemployment and increase industrialization in the country. This because in Nigeria the problem of corruption, political instability/ crisis, and bad political leadership are still the problem affecting the Nigeria economy, development, hence the issue of poverty, unemployment, crime and under development are still the order of the day in our system. We therefore conclude that the level of economic development in Nigeria is dependent on the extent public leaders judiciously and effectively invest on capital projects, to enhance the Nigeria GDP, reduce unemployment and enhance industrialization.

RECOMMENDATIONS

Based on the following, we recommend here that:

1. The government should avoid corruption in its effort to invest on capital projects, so as to promote economic development in Nigeria.
2. The Nigeria government should invest more on capital projects like roads construction; improve electrification and power generation, providing effective health care and educational services etc. as that will enhance economic development in Nigeria.
3. The government should promote industrialization as that will lead to employment generation and poverty reduction in our system.
4. Since the country has a corporative advantage in agriculture products, the government and private individuals should channel more investment on agriculture as that will promote/improve per capita income of the people and lead to economic improvement.
5. The national assembly and state assemblies should make lead that will enable the executive promote capital projects, investment and economic stability.

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