Capital vs Recurrent: The Challenge of Nigerian of Economic Growth

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ABSTRACT

This study compared the effect of capital and recurrent expenditure on Nigeria economic growth. The objective was to compare the effect capital and recurrent expenditure on Nigeria economic growth. Time series data were collected from Central Bank of Nigeria Statistical Bulletin from 1990-2021. Real gross domestic product was modeled as the function of capital and recurrent expenditure on administration, social services, economic service and transfer. Ordinary least square method, Augmented Dickey Fuller unit root test, cointegration, granger causality test and vector error correction was used as data analysis methods. The study found adjusted R-Square of the capital expenditure is 0.355303 while the recurrent expenditure is 0.341396. This indicates that capital expenditure explained 35.5 percent while recurrent expenditure explained 34.1 percent variation in Nigeria economic growth. The two models were statistically significant when judged by the value of F-statistic and probability. Capital expenditure on administration added 0.73 on Nigeria economic growth while recurrent expenditure on administration reduced economic growth by 6.3 percent. Capital expenditure on economic service added 0.86 while recurrent added 8.94 percent on economic growth, capital expenditure on social services added 0.98 while recurrent added 3.88 percent, capital expenditure on transfers added 0.93 while recurrent reduced by 0.1 percent. From the findings, the study conclude that capital expenditure has greater effect on economic growth than recurrent expenditure. The study recommends more budget allocations to capital expenditure than recurrent expenditure for better economic growth.

INTRODUCTION

Public expenditure plays an important role in the aggregate economy in different ways. It is used to produce various public goods and services such as infrastructural development which the market system cannot provide due huge cost. It is also used by the government to adopt various fiscal measures such as capital investment to stimulate economic activities particularly in the developing economy where there is abundant idle resources and during recession. Public expenditure is a kind of government intervention on economic activities to bridge the market imperfection as advocated by the Keynesian economists.

Public expenditure was justified due to the inefficiencies of the private sector to bridge gap between private and social goods (Okpara, 2002). The limitation in the price system or market mechanism gave impetus to the need for government intervention in the economic system through spending. The limitations revealed the failure of self-adjusting principle of the classical era and provide support to the Keynesian thesis that government is the best guidance of a nation's economy (Ezirim, 2005).The importance of public expenditure was widened by interest of economists in the problems of economic growth, planning regional disparities and income distribution. Public expenditure is an injection into the income stream, it is a mechanism to stimulate demand and widen the output of the economy as advocated by Keynes. Jhingan (2006) stated that the role of the public expenditure in economic development lies in increasing the growth rate of the economy, providing more employment opportunities, raising income and standard of living, reducing inequalities of income and wealth, encouraging private initiative and enterprise, bringing about regional balance, and stabilizing the economic activities.

Government capital expenditure refers to government spending on investment goods. It is government long-term expenditure plans that can affect the industrial sector of the economy. It means spending in things that last for a period of time which may include investment in roads, industries, equipment, agriculture CBN (2011) noted that capital expenditure is fiscal expenditure on goods classified as investment goods. As a component of fiscal

policy, capital expenditure if well managed has the capacity of increasing the productive capacity of the industrial sector, create employment and improve capacity utilization Aregenyen (2007). In Nigerian, capital expenditure is classified as economic services, social and community services, transfer and administration. The role of government capital expenditure on the growth of industrial sector has been a growing concern despite the fact that various policies have been formulated to improve the performance of the sector. Government capital expenditure has increase over the years without corresponding increase on the growth of the industrial sector. Empirical evidence and theories have shown that well plan government capital expenditure have the capacity of increasing the productive capacity of the industrial sector and the economy.

In Nigeria, government recurrent expenditure has continued to rise especially since the inception of the democratic era which began in 1999. Available data by the Central Bank of Nigeria (2016) revealed that government recurrent expenditure recorded an upward movement in all the years under study except in 2013. From a total sum of ₦449.66bn in 1999 up to ₦3,325.16bn in 2012 and it declined a bit to ₦3,214.95bn in 2013. In 2014, it commenced an upward movement form ₦3, 426.94bn to ₦4, 177.59bn in 2016, ₦5, 675.20bn in 2017, ₦6, 997.20bn in 2018, ₦8,188.81bn in 2020 and ₦9,1145.16bn in 2021. On the overall, the trend revealed a consistent increase in recurrent expenditure of government. This ever-increasing government recurrent expenditure has attracted lots of criticisms and complaints from a good number of citizens who argue that the government was wasteful and that the much spent on servicing recurrent component of the government should have been channeled to capital projects (Ijaiya, Sanni & Olanrewaju, 2017, Nurudeen & Usman, 2010). The impression created by the above argument is that recurrent expenditure does not increase economic growth in Nigeria. This study compared the effect of recurrent expenditure and capital expenditure on economic growth in Nigeria.

REVIEW OF RELATED LITERATURE

Capital Expenditure

Capital expenditure refers to the amount spent in the acquisition of fixed (productive) assets (whose useful life extends beyond the accounting or fiscal year), as well as expenditure incurred in the upgrade/ improvement of existing fixed assets such as lands, building, roads, machines and equipment. including intangible assets. Federal Government Expenditure in research also falls within these components of these expenditures. Capital expenditure is usually seen as expenditure creating future benefits, as there could be some lags between when it is incurred and when it takes effect on the economy.

Capital expenditure are budgeted expenses incurred by the government of any economy to ensure the certainty of projects execution which are of economic benefit to the government, citizens and economy of the country. The federal government capital expenditure over time has covered major infrastructures in the economic which includes; construction and rehabilitation of federal roads, fixed assets for the administration of the federal government running of its activities, agriculture equipment, power supply, industrialization for economic services, building of hospitals, schools and social amenities for social community services, payment of debts owed locally and internationally by the government to liquidate its debts obligations as transfers. All these expenditures are categorized as major expenditure which only the federal governments will solely take responsibility in ensuring that these facilities and services are being provided for the growth of its economy.

Osiegbu et al (2010) posited that the federal government capital expenditure is another means of stimulating the economic growth of Nigeria by means of its fiscal policies consideration. When the federal government seems to boost the economy activities, it executes projects through the approved budgeted funds meant for its capital expenditure for that year. In other words, it is termed the federal government capital expenditure fiscal year policy; since it is possesses the characteristics and role of fiscal policy towards the growth of an economy then federal government capital expenditure should be a fundamental element of economic variables which could characterize the well-being of productivity within the Nigerian economy.

Recurrent Expenditure

Recurrent expenditure on the other hand refers to expenditure on purchase of goods and services, wages and

salaries, operations as well as current grants and subsidies (usually classified as transfer payments). Recurrent expenditure, excluding transfer payments, is also referred to as government final consumption expenditure. Recurrent expenditure in Nigeria can be disaggregated into four; administration, SCS, ES and transfers, classified under economic functions/obligations of government, while Administration (Defense, internal security and general administration) is classified as non-economic function/obligation of government.

Economic Growth

Economic Growth refers to the ability of an economy to improve its production of goods and services over a period of time using the factors of production within the economy (Popkova, Shakhovkaya, & Mitrakhovich, 2008). Economic Growth is usually calculated in real terms thus inflation-adjusted terms to eliminate the distorting effect of inflation on the price of goods produced. Several theories have been developed to explain the economic growth of a country.

Rostow, an American economist developed the Rostow's Stages of Growth model in which it explains the idea about the transition of an economy from underdevelopment status to a developed status through various stages a country must precede. Thus, a country must precede from a traditional stage (in which the foundations for growth are based on subsistence production) to a "take off" stage (in which development starts to accelerates), to a matured stage of development. Roy – F Harrod in 1939 and Evsey Domar in 1947 also developed the Harrod - Domar Growth model from the Keynesian model. The model with specific assumptions such as a scarce capital resource, constant capital and output with consumption and savings being a constant proportion of income, the main thrust of the model was that the rate of savings was the principal determinant of the growth of the economy under given levels of productivity of capital (incremental capital output ratio) and a state of technology.

The Keynesian Theory

In the Keynesian macroeconomics, an increase in government expenditure has an expansionary effect on income and employment through the multiplier effects on aggregate demand. On the other side, government expenditure crowds out private investment as a result of an increase in the rate of interest and this slows down economic growth and reduces the rate of capital accumulation in the long run. Keynes (1936) regarded government expenditure as an exogenous variable that contributes positively to economic growth. Hence, an increase in government expenditure would likely lead to an increase in employment, profitability and output through the multiplier effects on aggregate demand. With the introduction of government expenditure (G) by Keynes, the national income determination model is expanded which becomes;

$$AD=C+I+G$$

Where, AD represents aggregate demand, which equals the sum of consumption (C), Investment (I), and government expenditure. Government expenditure has a direct and positive impact on GDP. An increase in government expenditure will boost aggregate demand, resulting in a higher level of national income. All things being equal, an increase in government spending has an expansionary effect on output and income while a decrease has a contractionary effect on output and income. The neoclassical growth models argued that government fiscal policy does not have a positive effect on the growth of an economy. On the contrary, a significant number of scholars have agreed that fiscal policy is a potent tool for promoting growth and improving failures arising from the inefficiencies of the market. Hence, government fiscal policy could be a vital tool for militating against failure arising from market inefficiencies (Abu, 2010).

Adolph Wagner's Theory of Increasing State Activities

The earliest of all theories of government growth is Wagner's Law of Increasing State Activity. This theory posits a relationship linking industrialization, urbanization and education to the expansion of the public sector. Bird (1971) the activities of the different tiers of government (federal, state and local) increase both intensively and extensively arising from the increasing demand for public utilities. Wagner advanced the theory of rising public expenditure by analyzing the trend in the growth of government expenditure and the size of government expenditure. Wagner's law postulates that: (i) the extension of the functions of the states leads to an increase in

public expenditure on administration and regulation of the economy; (ii) 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 (iii) the rise in public expenditure will be more than proportional increase in the national income (income elastic wants) and will thus result in a relative expansion of the public sector. So it is the economic growth that determines government size.

The theory explains that increases in public goods are a product of increased demands by organized industrial workers, coming at the costs of growth in the private sector (Wagner, 1958). The government sector tends to grow faster than the economy. Bureau Voting Theory rejected the role of industrialization and urbanization, suggesting that the main driver of public sector expansion is an artificial demand for government services created by self-interested government employees (Niskanen, 1971), fiscal illusion theory, which tries to explain government growth by linking the intricacies of tax systems to the masking of the costs of public goods. Also, tax systems can hide the costs of public goods and therefore stimulate their growth (Goetz, 1977). Empirical support for these theories has varied, causing them to lose some of their impetus.

Musgrave's Theory of Public Expenditure Growth

The Musgrave's theory of public expenditure and growth explained that, at low level of per capita income, the demand for public services tend to be very low, arguing that such income is devoted to satisfying primary needs and it is only when the per capita income starts to rise above these level of low income that the demand for services provided by the public sector such as education, health, and transports starts to rise, thereby forcing government to increase expenditure on them. The theory observed that with high per capita income typical in the developed nations, the rate of public spending falls as most basic wants are being satisfied. Therefore, the theory suggested in connection to Wagner that as progressive nations become more industrialized, the share of the public sector in the national economy grows continually (Musgrave, 1988). Iyoha (2002) stated five stages of expenditure growth; Traditional society, preconditions for take-off, the take-off; the drive to maturity and the eye of high mass consumption. What determines the accepted expenditure-growth depends critically on the assumption of the type of economy, i.e. whether it is a free-market economy, a mixed economy or a command economy.

Empirical Review

Ekpo, Daniel and Okon (2022) employed modified and extended aggregate production model to examine the effects of government expenditure at its' aggregate level on economic growth in Nigeria for the period (1981-2018) using bound test (ARDL) approach. The co-integration result indicates the existence of long-run relationship between total government expenditure (LTGE) and economic growth in Nigeria, ARDL results show that total government expenditure (LTGE) impacted positively on economic growth in Nigeria in line with Keynesian theory. The granger causality test result indicates the existence of uni-directional causal relationship from LGDP to LTGE for the observed period, in line with Wagner's theory. It is recommended that there should be proper utilization of public fund in the provision of security and critical infrastructure especially electricity supply and road infrastructure which are precursors to effective economic performance. Public fund should be properly managed to ensure accountability, transparency and fiscal responsibility in carrying out public assignment. It is believed that if corruption is tackled in the country, more public fund will be freed for development and public expenditure would impact more on the economic performance, hence, the fight against corruption in the country should be frontally confronted. Public institutions charged with the responsibility of handling corruption matters in the country should be overhauled and strengthen to ensure timely and proper handling of corruption matters.

Ogbuagu and Ekpenyong (2015) investigated the impact of the components of public expenditure on economic growth in Nigeria from 1970 to 2014. Recurrent expenditure, capital expenditure, net exports, inflation rate and gross national savings served as the independent variables while gross domestic product served as the dependent variable. Unit root test, Toda-Yamamoto causality test and autoregression distributive lag (ARDL) technique were used as analytical tools. Findings showed that recurrent expenditure had a positive and significant impact on economic growth both in the short run and long run. However, the study showed that capital expenditure had no short run effect on economic growth, but rather exhibited a negative significant effect on economic

growth only in the long run. National savings had negative and significant impact on economic growth in the short run but a positive and significant effect in the long run. Finally, the study revealed that net exports had a negative impact on economic growth in Nigeria.

Ojonugwa, Esther and Hindatu (2016) examined the relationship between government expenditure and economic growth in Nigeria for the period 1970 to 2010. Recurrent expenditure and capital expenditure were adopted as proxies for government expenditure while real gross domestic product was proxy for economic growth. Unit root test, cointegration test, Pair-wise cointegration test and Grangercausality test were empirical tools. The study showed that both capital expenditure and recurrent expenditure had positive and significant relationship with economic growth in the short run. Recurrent expenditure exhibited positive and significant relationship with economic growth in the short run while capital expenditure had a negative but significant relationship with economic growth in the short run. The Pair-wise Granger-causality test showed that there was a unidirectional causality running from economic growth to both capital and recurrent expenditures showing that economic growth determined both capital and recurrent expenditures in Nigeria.

Nwoha, Onwuka and Ejem (2017) examined the effect of aggregated and disaggregated government expenditure on economic growth in Nigeria for the period 1980 to 2015. The study adopted aggregated government expenditure (proxied by total federal government expenditure). Disaggregated expenditure was proxied by recurrent expenditure and capital expenditure while real gross domestic product served as proxy for economic growth. All of total government expenditure, recurrent expenditure and capital expenditure served as the independent variables while real GDP served as the dependent variable. The study employed the error correction mechanism (ECM) as the empirical tool for its tests and analysis. Findings showed that total federal government expenditure and capital expenditure had positive and significant effect on economic growth in Nigeria. On the other hand, the study revealed that recurrent expenditure had a positive and insignificant effect on economic growth in Nigeria.

Ditimi, Nwosa, and Ajisafe (2019) examined relationship between the components of government expenditure with focus on education, agriculture, health and transport and telecommunication variables on economic growth in Nigeria for the period between 1970 and 2018. The results of the long run and short run regression estimates indicated that expenditure on agriculture was the most significant of the components of government expenditure that impacted on economic growth.

Nworji, Okwu, Obiwuru and Nworji (2018) studied the effect of public government spending on economic growth in Nigeria based on variables considered relevant indicators of economic growth and government expenditure for the period 1970 – 2017. The Ordinary Least Square (OLS) multiple regression models specified on perceived causal relationship between government expenditure and economic growth was used. Results of the analysis showed that capital and recurrent expenditure on economic services had insignificant negative effect on economic growth. Capital expenditure on transfers had insignificant positive effect on growth. Capital and recurrent expenditures on social and community services and recurrent expenditure on transfers had significant positive effect on economic growth.

Oziengbe (2016) explored the relative impacts of federal capital and recurrent expenditures on Nigeria's economy from 1980 to 2015. The study investigated the effect of total government expenditure (GOVEXP) on gross domestic product (GDP) using multiple linear regression analysis. The result showed evidence that strongly supported Ram's growth accounting model. The Error Correction Model (ECM) model revealed that the short-run impact of each explanatory variable on GDP was statistically insignificant contemporaneously, but significant with a lag, with RECEXP exerting greater impact than CAPEXP, though the impact of the former was negative while that of the latter was positive.

Akanbi (2018) investigated Government expenditure in Nigeria: Determinants and trends. The study used time series data from 1974 to 2016. It was discovered that capital and recurrent expenditure were resilient to shocks in total government spending and, also, total government expenditure was confirmed to be resilient to shocks in capital and recurrent spending.

Aremu, Babalola, Aninkan, and Salako (2020) investigated the impact of government expenditures on critical

sectors on economic growth in Nigeria (1984-2019). The study employed Autoregressive Distributed Lag model (Bound Test Co-integration Approach) to estimate both short and long run impact of Government expenditures on economic growth. The result revealed that government expenditure on defence impacts negatively on economic growth while government expenditure on agriculture enhances economic growth. Government expenditure on education, transport and communication did not impact on economic growth in the long-run.

Kanayo, Akujinma and Francis (2016) examined the long run relationship between government expenditure and economic growth Nigeria. Johansen co-integration was the tool of analysis employed in testing the long run relationship while Vector Error Correction Model (VECM) was used to test the short and long run adjustments. Granger causality effect test was adopted to analyse the effect of government expenditure on economic growth. The long run test revealed the evidence of a long run relationship between government expenditure and economic growth in Nigeria. The vector error correction model analysis suggested the possibility of Nigeria achieving a steady level of growth if preference is given to capital expenditure more than recurrent expenditure. The granger causality effect result obtained showed that recurrent and capital expenditure which have significant effect on economic growth in Nigeria.

Bashir, Hamza and Rafiat (2017) studied the impact of government expenditure on economic growth in Nigeria. The study covered the period of 1981-2016 using Ordinary Least Square (OLS) technique and granger causality test were employed. The result obtained indicated that there was negative and insignificant relationship between human capital and GDP, the relationship between physical capital and GDP as well as between government capital expenditure (GCE) and GDP were positive but insignificant. The granger causality test showed that government expenditure granger caused GDP but GDP did not granger cause government expenditure.

Idris and Bakar (2017) examined the relationship between government expenditure and economic growth with the aim of establishing a stable relationship. To estimate the existence or otherwise of the equilibrium relationship among the examined variables the study employed an ARDL model. The data covered a period of thirty-five (35) years from 1980 to 2015.The result from the ARDL estimation indicated an existence of positive and long-run equilibrium relationship between economic growth and government expenditure in Nigeria.

Ifarajimi and Ola (2017) studied the relationship between government expenditure and economic growth. Time series data on government expenditure on administration, economic services, social and community services, transfers, government total revenue, nominal exchange rate and real per capital GDP for the period of 1981 to 2015 were employed. The study used ECM computed through Dynamic OLS and found that long run government expenditure on administration and nominal exchange rate were significant and therefore impact significantly on economic growth in Nigeria.

METHODOLOGY

This study employed Ex-post facto research design. The study used time series data obtained from the Central bank of Nigeria Statistical bulletins and the World Development indicators covering the period from 1990-2021. This study employed the use of ordinary Least Square methods to compare the impact of government recurrent and capital expenditure on economic growth in Nigeria. The study used the Augmented Dickey Fuller test to ensure that all variables are stationary; this is to avoid the spurious regression problem associated with unit roots. The Johansen cointegration test was conducted and it showed that there is no long run relationship among the variables.

Model Specifications

Thus, we express the model as follows;

RGDP =f(CAPEXA,CAPES, CAPSS, CAPEXTR) (1)

RGDP =f(RECEXA, RECXES, REXSS, REXTR) (2)

Transforming equation 1 above to econometric method, we have:

$$RGDP = \alpha + \beta_1 CAPEXA + \beta_2 CAPES + \beta_3 CAPSS + \beta_4 CAPXTR + \mu \quad (3)$$

$$RGDP = \alpha + \beta_1 RECEXA + \beta_2 RECXES + \beta_3 REXSS + \beta_4 REXTR + \mu \quad (4)$$

Where

RGDP = Real Gross domestic products

CAPEXA = Capital expenditure on administration as percentage of total capital expenditure

CAPES = Capital expenditure on economic service as percentage of total capital expenditure

CAPSS = Capital expenditure on social services as percentage of total capital expenditure

CAPEXTR = Capital expenditure on transfer as percentage of total capital expenditure

RECEXA = Recurrent expenditure on administration as percentage of gross domestic product

RECXES = Recurrent expenditure on economic services as percentage of gross domestic product

REXSS = Recurrent expenditure on social services as percentage of gross domestic product

REXTR = Recurrent expenditure on transfer as percentage of gross domestic product

μ = Error Term

$\beta_1 - \beta_4$ = Coefficient of Independent Variables to the Dependent Variable

β_0 = Regression Intercept

Methods of Data Analysis

In order to estimate the regression model, E-views econometrics and statistical package will be used. The procedure involves specifying the dependent and independent variables; in this case, stock market return is the dependent variable while capital assets pricing models is the independent variables. The main tool of analysis is the Ordinary Least Squares (OLS) using the multiple regression method for a period of 33 years, annual data covering 1990-2021. Statistical evaluation of the global utility of the analytical model, so as to determine the reliability of the results obtained were carried out using the coefficient of correlation (r) of the regression, the coefficient of determination (r^2), the student T-test and F-test.

Unit Root Test

It is suggested that when dealing with time series data, a number of econometric issues can influence the estimation of parameter using Ordinary Least Square (OLS). Regressing a time series variable on another time series variable using Ordinary Least Square (OLS) estimation can obtain a very high R^2, although there is no meaningful relationship between the variables. This situation reflects the problem of spurious regression between totally unrelated variables generated by a non-stationary process. Therefore, it is recommended that a stationarity (unit root) test be carried out to test for the order of integration. The Augmented Dickey-Fuller (ADF) test is used. The ADF test simply runs a regression of the first-difference of the series against a first-lagged value, constant, and a time trend as the following:

Without Intercept and Trend $DYt = d\ Yt\text{-}1 + Ut$ (5)

With Intercept $DYt = a + d\ Yt\text{-}1 + Ut$ (6)

With Intercept and Trend $DYt = a + bT + d\ Yt\text{-}1 + Ut$ (7)

The hypothesis is

Ho: d = 0 (Unit Root)

H1: d ¹ 0

Decision rule:

Decision rule:

If t* > ADF critical value, ==> do not reject null hypothesis, i.e., unit root exists.

If t* < ADF critical value, ==> reject null hypothesis, i.e., unit root does notexist.

Cointegration Test

Testing for Cointegration Using Johansen's Test

Johansen's methodology takes its starting point in the vector auto regression (VAR) of order p given by

$$yt = \mu + A1Yt-1+\cdots+A2Yt-2+\delta tyt = \mu + A1Yt-1+\cdots+A2Yt-2+\delta t \quad (8)$$

Whereyt is an nx1 vector of variables that are integrated of order one – commonly denoted I(1) – and at is an nx1 vector of innovations. This VAR can be re-written as

$$\Delta yt = \mu + nyt-1+\sum_{t-1}^{p-1} ri\Delta yt-1+Et$$
$$\Delta yt = \mu + nyt-1+\sum_{t-1}^{p-1} ri\Delta yt-1+Et \quad (9)$$

Where

$$u-\sum_{i-1}^{p} Ai-I \; and \; r1--\sum_{i-E-l}^{p} Aj \quad 10)$$

If the coefficient matrix II has reduced rank r<n, then there exist nxr matrices a and β each with rank r such that II = αβ' and β'yt is stationary. R is the number of cointegrating relationships, the elements of a are known as the adjustment parameters in the error correction model and each column of β is a cointegrating victor. It can be shown that for a given r, the maximum likelihood estimator of β defines the combination of yt-1 that yields the r largest canonical correlations of $^{\Delta ty\,\Delta ty}$ with yt-1 after correcting for lagged difference and deterministic variables when present. Johansen proposes two different likelihood ratio tests of the significance of these canonical correlations and thereby the reduced rank of the II matric: the trace test and maximum eigen value test, shown in equations (8) and (9) respectively.

$$\int trace \;\; r\sum_{r-1}^{m} m(1\,A1) \quad (11)$$

$$\int trace = Tin(1 \;\; \boldsymbol{\lambda r}+\mathbf{1}) \quad (12)$$

Here T is the sample size and **λ**i is the largest canonical correlation. The trace test tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of n cointegrating vectors. The maximum Eigen value test, on the other hand, test the null hypothesis of r cointegrating vectors against the alternative hypothesis of r+1 cointegrating vectors. Neither of these test statistics follows a chi square distribution in general; asymptotic critical values can be found in (Johnsen and Juselius, 1990) and are also given by most econometric software packages. Since the critical values used for the maximum Eigen value and trace test statistics are based on a pure

unit-root assumption, they will no longer be correct when the variables in the system are near unit-root processes. Thus, the real question is how sensitive Johansen's procedures are to deviations from the pure unit root assumption.

Granger Causality Test

One of the objectives of this study is to investigate the causality between the independent and the dependent variables. Granger causality test according to Granger (1969) is used to examine direction of causality between two variables. Therefore, in this study, carried out a granger causality between an independent variables monetary policy and the dependent variables private sector funding in Nigeria from 1990-2021.The pair-wise granger causality test is mathematically expressed as:

$$RGDP = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}CAPEXA_{t-j} + \sum_{j=1}^{k}\beta_{2j}CAPES_{1-j} + \sum_{j=1}^{k}\lambda_{2j}CAPSS_{t-j} + \sum_{j=1}^{k}\theta_{2j}CAPEXTR_{t-j} + \sum_{j=1}^{k} + \mu \quad (13)$$

$$CAPEXA = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}RGDP_{t-j} + \sum_{j=1}^{k}\beta_{2j}CAPES_{1-j} + \sum_{j=1}^{k}\lambda_{2j}CAPSS_{t-j} + \sum_{j=1}^{k}\theta_{2j}CAPEXTR_{t-j} + \sum_{j=1}^{k} + \mu \quad (14)$$

$$CAPES = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}CAPEXA_{t-j} + \sum_{j=1}^{k}\beta_{2j}RGDP_{1-j} + \sum_{j=1}^{k}\lambda_{2j}CAPSS_{t-j} + \sum_{j=1}^{k}\theta_{2j}CAPEXTR_{t-j} + \sum_{j=1}^{k} + \mu \quad (15)$$

$$CAPSS = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}CAPEXA_{t-j} + \sum_{j=1}^{k}\beta_{2j}CAPES_{1-j} + \sum_{j=1}^{k}\lambda_{2j}RGDP_{t-j} + \sum_{j=1}^{k}\theta_{2j}CAPEXTR_{t-j} + \sum_{j=1}^{k} + \mu \quad (16)$$

$$CAPEXTR = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}CAPEXA_{t-j} + \sum_{j=1}^{k}\beta_{2j}CAPES_{1-j} + \sum_{j=1}^{k}\lambda_{2j}CAPSS_{t-j} + \sum_{j=1}^{k}\theta_{2j}CAPEXTR_{t-j} + \sum_{j=1}^{k} + \mu \quad (17)$$

$$RGDP = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}RECEXA_{t-j} + \sum_{j=1}^{k}\beta_{2j}RECXES_{1-j} + \sum_{j=1}^{k}\lambda_{2j}RECXSS_{t-j} + \sum_{j=1}^{k}\theta_{2j}REXTR_{t-j} + \sum_{j=1}^{k} + \mu \quad (18)$$

$$RECEXA = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}RGDP_{t-j} + \sum_{j=1}^{k}\beta_{2j}RECXES_{1-j} + \sum_{j=1}^{k}\lambda_{2j}RECXSS_{t-j} + \sum_{j=1}^{k}\theta_{2j}REXTR_{t-j} + \sum_{j=1}^{k} + \mu \quad (19)$$

$$RECXES = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}RECEXA_{t-j} + \sum_{j=1}^{k}\beta_{2j}RGDP_{1-j} + \sum_{j=1}^{k}\lambda_{2j}RECXSS_{t-j} + \sum_{j=1}^{k}\theta_{2j}REXTR_{t-j} + \sum_{j=1}^{k} + \mu \quad (20)$$

$$RECXSS = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}RECEXA_{t-j} + \sum_{j=1}^{k}\beta_{2j}RECXES_{1-j} + \sum_{j=1}^{k}\lambda_{2j}RGDP_{t-j} + \sum_{j=1}^{k}\theta_{2j}REXTR_{t-j} + \sum_{j=1}^{k} + \mu \quad (21)$$

$$REXTR = \alpha_{2t} + \sum_{j=1}^{k}\phi_{2j}RECEXA_{t-j} + \sum_{j=1}^{k}\beta_{2j}RECXES_{1-j} + \sum_{j=1}^{k}\lambda_{2j}RECXSS_{t-j} + \sum_{j=1}^{k}\theta_{2j}RGDP_{t-j} + \sum_{j=1}^{k} + \mu \quad (22)$$

Where x_t and y_t are the variables to be tested white u_t and v_t are the white noise disturbance terms. The null hypothesis $\pi_1^y = dp_1^y = 0$, for all I's is tested against the alternative hypothesis $\pi_1^i \neq 0$ and $dp_1^i \neq 0$. if the co-efficient of π_1^i are statistically significant but that of dp_1^i are not, then x causes y. If the reverse is true then y causes x. however, where both co-efficient of π_1^i and dp_1^i are significant then causality is bi – directional.

Vector Error Correction (VEC) Technique

Co-integration analysis provides a test for spurious correlation. Finding co integration between apparently correlated I(1) series validate the regression but failure to find co integration is an indication that spurious correlation maybe present thus invalidating the inferences drawn from such correlation. Co-integration is a prerequisite for the error correction mechanism. Since co-integration has been established, it is pertinent to proceed to the error correction model. The VECM is of this form

$$\Delta y_t = \alpha\beta y_{t-1} + \sum_{i=1}^{j=1}\Gamma_j\Delta y_{t-1} + \pi + \varsigma_t, t = 1,\ldots..,T \quad (23)$$

Where Y_t is a vector of indigenous variables in the model, α is the parameter which measures the speed of

adjustment through which the variables adjust to the long run values and the β is the vectors which estimates the long run cointegrating relationship among the variables in the model. π is the draft parameter and is the matrix of the parameters associated with the exogenous variables and the stochastic error term.

ANALYSIS AND DISCUSSION OF FINDINGS

Table 2: ADF Unit Root Test for Stationarity at Level

Variable	ADF Statistic	MacKinnon @ 1%	MacKinnon @ 5%	MacKinnon @ 10%	Prob.	Order of Int	**Conclusion**
Capital expenditure and economic growth							
ADF @ Level							
RGDP	-2.971604	-3.661661	-2.960411	-2.619160	0.0488	1(0)	Not stationary
CAPSS	-1.956123	-3.670170	-2.963972	-2.621007	0.3036	1(0)	Not stationary
CAPEXTR	-2.334537	-3.661661	-2.960411	-2.619160	0.1681	1(0)	Not stationary
CAPEXA	-2.118941	-3.661661	-2.960411	-2.619160	0.2390	1(0)	Not stationary
CAPES	-2.765171	-3.661661	-2.960411	-2.619160	0.0750	1(0)	Not stationary
ADF @ Difference							
RGDP	-8.093635	-3.670170	-2.963972	-2.621007	0.0000	1(1)	Stationary
CAPSS	-10.21366	-3.670170	-2.963972	-2.621007	0.0000	1(1)	Stationary
CAPEXTR	-5.279315	-3.711457	-2.981038	-2.629906	0.0002	1(1)	Stationary
CAPEXA	-7.042656	-3.670170	-2.963972	-2.621007	0.0000	1(1)	Stationary
CAPES	-12.01791	-3.689194	-2.971853	--2.625121	0.0000	1(1)	Stationary
Recurrent expenditure and economic growth							
ADF @ Level							
RGDP	-2.971604	-3.661661	-2.960411	-2.619160	0.0488	1(0)	Not stationary
REXTR	-1.505364	-3.661661	-2.963972	-2.619160	0.2146	1(0)	Not stationary
REXSS	-1.182132	-3.661661	-2.960411	-2.619160	0.2627	1(0)	Not stationary
RECXES	-2.684361	-3.699871	-2.976263	-2.627420	0.0897	1(0)	Not stationary
RECEXA	-1.919700	-3.661661	-2.960411	-2.619160	0.1153	1(0)	Not stationary
ADF @ Difference							
RGDP	-8.093635	-3.670170	-2.963972	-2.621007	0.0000	1(1)	Stationary
REXTR	-8.781259	-3.670170	-2.963972	-2.621007	0.0000	1(1)	Stationary
REXSS	-8.329543	-3.670170	-2.963972	-2.621007	0.0002	1(1)	Stationary
RECXES	-5.924880	-3.769597	-3.004861	-2.642242	0.0000	1(1)	Stationary
RECEXA	-8.849636	-3.670170	-2.963972	-2.621007	0.0000	1(1)	Stationary

Source: Extract from E-view 9.0

The time series properties of the variables used in the analysis was investigated using Augmented Dickey-Fuller test. The test was run with specification of trend and intercept in the model. The ADF statistics for the test are

presented in the table above. It can be seen from the table 1 above that the unit root test results, using the ADF unit root test suggest that all series are stationary at order I (1). Therefore, the Engle and Granger (1987) can be employed.

Table 2 : Unrestricted Cointegration Rank Test (Trace)					
Hypothesized		Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**	
Capital expenditure and economic growth					
None *	0.712914	61.41127	47.85613	0.0016	
At most 1*	0.346101	73.97206	59.79707	0.0016	
At most 2	0.233748	11.22800	15.49471	0.1979	
At most 3	0.102393	3.240690	3.841466	0.0718	
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)					
Hypothesized		Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**	
None *	0.712914	37.43921	27.58434	0.0020	
At most 1	0.346101	42.74406	21.13162	0.0361	
At most 2	0.233748	7.987311	14.26460	0.3800	
At most 3	0.102393	3.240690	3.841466	0.0718	
Recurrent expenditure and economic growth					
Unrestricted Cointegration Rank Test (Trace)					
None *	0.700627	81.42359	69.81889	0.0045	
At most 1*	0.536452	55.24163	47.85613	0.042	
At most 2	0.364256	22.17628	29.79707	0.2888	
At most 3	0.202258	8.587484	15.49471	0.4049	
At most 4	0.058499	1.808398	3.841466	0.1787	
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)					
Hypothesized		Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**	
None *	0.700627	36.18196	33.87687	0.0261	
At most 1*	0.536452	43.06535	27.58434	0.0407	
At most 2	0.364256	13.58880	21.13162	0.3997	
At most 3	0.202258	6.779086	14.26460	0.5156	
At most 4	0.058499	1.808398	3.841466	0.1787	

Source: Extract from E-view 9.0

From table 2, the results of the Johansen co-integration test show that we reject the null hypotheses of one co-integrating equation at the 5% level of significance. This implies that, there is linear combination of the variables

that are stationary in the long run and also confirms the non-existence of a long-run relationship between capital and recurrent expenditure and economic growth.

Table 3: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
Capital expenditure and economic growth			
CAPSS does not Granger Cause RGDP	30	2.35233	0.1159
RGDP does not Granger Cause CAPSS		1.05879	0.3619
CAPEXTR does not Granger Cause RGDP	30	10.1814	0.0006
RGDP does not Granger Cause CAPEXTR		2.20583	0.1311
CAPEXA does not Granger Cause RGDP	30	2.75549	0.0829
RGDP does not Granger Cause CAPEXA		0.69425	0.5088
CAPES does not Granger Cause RGDP	30	4.64975	0.0192
RGDP does not Granger Cause CAPES		2.10696	0.1427
Recurrent expenditure and economic growth			
REXTR does not Granger Cause RGDP	30	0.70063	0.5058
RGDP does not Granger Cause REXTR		3.90042	0.0335
REXSS does not Granger Cause RGDP	30	2.05263	0.1495
RGDP does not Granger Cause REXSS		0.51283	0.6050
RECXES does not Granger Cause RGDP	30	1.78384	0.1887
RGDP does not Granger Cause RECXES		1.58633	0.2246
RECEXA does not Granger Cause RGDP	30	3.67018	0.0400
RGDP does not Granger Cause RECEXA		1.16139	0.3294

Source: Extract from E-view 9.0

Pair wise causality tests were run with an optimal lag of 2. The results are presented in table 3. The researcher's interest here is to establish the direction of causality between the dependent variables and the independent variables from 1990-2021. The study found a uni-directional causality from capital expenditure on transfer and economic service on gross domestic product. The study also found a uni-directional causality from real gross domestic product to recurrent expenditure on transfers and from administration to gross domestic products.

Table 4: Presentation of the Vector Error Correction Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CAPSS(-1))	0.977149	0.017662	-0.487075	0.6306
D(CAPEXA(-1))	0.731633	0.997849	-0.484598	0.6324
D(CAPES(-1))	0.857440	0.022457	-0.485920	0.6314
D(CAPEXTR(-1))	0.935801	0.012504	-0.486960	0.6307
C	0.470958	0.557817	-0.844287	0.4068
ECM(-1)	0.627059	0.168806	-3.714660	0.0011

R-squared	0.466458	Mean dependent var		-0.274333
Adjusted R-squared	0.355303	S.D. dependent var		3.759195
S.E. of regression	3.018372	Akaike info criterion		5.224169
Sum squared resid	218.6536	Schwarz criterion		5.504408
Log likelihood	-72.36253	Hannan-Quinn criter.		5.313820
F-statistic	4.196474	Durbin-Watson stat		1.451692
Prob(F-statistic)	0.006992			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REXTR(-1))	-0.109835	0.598008	-0.183668	0.8558
D(REXSS(-1))	3.884301	3.469885	1.119432	0.2740
D(RECXES(-1))	8.964507	3.992305	2.245446	0.0342
D(RECEXA(-1))	-6.732596	3.106698	-2.167122	0.0404
C	-0.379303	0.560232	-0.677047	0.5049
ECM(-1)	-0.474914	0.166821	-2.846850	0.0089
R-squared	0.454949	Mean dependent var		-0.274333
Adjusted R-squared	0.341396	S.D. dependent var		3.759195
S.E. of regression	3.050752	Akaike info criterion		5.245510
Sum squared resid	223.3702	Schwarz criterion		5.525749
Log likelihood	-72.68265	Hannan-Quinn criter.		5.335161
F-statistic	4.006510	Durbin-Watson stat		1.490353
Prob(F-statistic)	0.008752			

Source: Extract from E-view 9.0

From the results, the adjusted R-Square of the capital expenditure is 0.355303 while the recurrent expenditure is 0.341396. This indicates that capital expenditure explained 35.5 percent while recurrent expenditure explained 34.1 percent variation in Nigeria economic growth. The two models were statistically significant when judged by the value of F-statistic and probability.

DISCUSSION OF FINDINGS

From the results capital expenditure on administration added 0.73 on Nigeria economic growth while recurrent expenditure on administration reduced economic growth by 6.3 percent. Capital expenditure on economic service added 0.86 while recurrent added 8.94 percent on economic growth, capital expenditure on social services added 0.98 while recurrent added 3.88 percent, capital expenditure on transfers added 0.93 while recurrent reduced by 0.1 percent. Empirically, the positive effect of the variables confirm the expectations of the study and the findings of Ekpo, Daniel and Okon (2022) that total government expenditure (LTGE) impacted positively on economic growth in Nigeria in line with Keynesian theory. The granger causality test result indicates the existence of uni-directional causal relationship from LGDP to LTGE for the observed period, in line with Wagner's theory, the findings of Ogbuagu and Ekpenyong (2015) that capital expenditure had no short run effect on economic growth, but rather exhibited a negative significant effect on economic growth only in the long run, Ojonugwa, Esther and Hindatu (2016) that both capital expenditure and recurrent expenditure had positive and significant relationship with economic growth in the short run, Nwoha, Onwuka and Ejem (2017) that total federal government expenditure and capital expenditure had positive and significant effect on economic growth in Nigeria.

The findings of Ditimi, Nwosa, and Ajisafe (2019) the long run and short run regression estimates indicated that expenditure on agriculture was the most significant of the components of government expenditure that impacted on economic growth, Nworji, Okwu, Obiwuru and Nworji (2018) that capital and recurrent expenditure on economic services had insignificant negative effect on economic growth. Capital expenditure on transfers had insignificant positive effect on growth, Oziengbe (2016) that strongly supported Ram's growth accounting model, Akanbi (2018) that capital and recurrent expenditure were resilient to shocks in total government spending and, also, total government expenditure was confirmed to be resilient to shocks in capital and recurrent spending, Aremu, Babalola, Aninkan, and Salako (2020) that government expenditure on defence impacts negatively on economic growth while government expenditure on agriculture enhances economic growth.

The findings of Kanayo, Akujinma and Francis (2016) Johansen co-integration was the tool of analysis employed in testing the long run relationship while Vector Error Correction Model (VECM) was used to test the short and long run adjustments. Granger causality effect test was adopted to analyse the effect of government expenditure on economic growth, Bashir, Hamza and Rafiat (2017) that there was negative and insignificant relationship between human capital and GDP, the relationship between physical capital and GDP as well as between government capital expenditure (GCE) and GDP were positive but insignificant, Idris and Bakar (2017) indicated an existence of positive and long-run equilibrium relationship between economic growth and government expenditure in Nigeria and Ifarajimi and Ola (2017) that long run government expenditure on administration and nominal exchange rate were significant and therefore impact significantly on economic growth in Nigeria.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study compared the effect of capital and recurrent expenditure on Nigeria economic growth. The study used time series data sourced from Central Bank of Nigeria Statistical Bulletin 1990-2021. The study conclude that capital expenditure have greater explained variation on Nigeria economic growth over the periods covered in the study. from the findings, the study conclude that capital expenditure on administration added 0.73 on Nigeria economic growth while recurrent expenditure on administration reduced economic growth by 6.3 percent. Capital expenditure on economic service added 0.86 while recurrent added 8.94 percent on economic growth, capital expenditure on social services added 0.98 while recurrent added 3.88 percent, capital expenditure on transfers added 0.93 while recurrent reduced by 0.1 percent.

Recommendations

1. There should be proper utilization of public fund in the provision of security and critical infrastructure especially electricity supply and road infrastructure which are precursors to effective economic performance.
2. Public fund should be properly managed to ensure accountability, transparency and fiscal responsibility in carrying out public assignment. It is believed that if corruption is tackled in the country, more public fund will be freed for development and public expenditure would impact more on the economic performance, hence, the fight against corruption in the country should be frontally confronted.
3. Public institutions charged with the responsibility of handling corruption matters in the country should be overhauled and strengthen to ensure timely and proper handling of corruption matters.
4. The fiscal responsibility Act 2004 should be implemented to guide the public expenditure to achieve the macroeconomic objectives. The macroeconomic frame work and the business environment should be overhaul for positive impact of public capital expenditure and the growth of Nigerian economy.
5. Poor policies on government expenditures impact negatively to the growth of Nigerian industrial sector. The study recommend for better policies to manage the expenditure of the government. Economic theories have it that unproductive expenditures do not impact on the growth of Nigerian economy. The study recommends that government should spend on productive ventures.
6. The study recommend for overhaul in policies of revenue and expenditures to enhance the growth of

Nigerian industrial sector. Most of the government revenue and expenditures are stolen by public office holders. The study recommend for enforceable laws to back the anti-corruption agencies.

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