PUBLIC SECTOR EXPENDITURE AND NATIONAL INCOME IN NIGERIA

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ABSTRACT:

The interest of this research was to examine the influence of public sector expenditure on national income in Nigeria during the period 2012-2022. Three research purposes, research questions and null hypotheses were formed to guide this research. Public sector expenditure was used as the predictor variable. Developmental, productive and plan expenditures were employed as the dimensions of public sector expenditure, while national income was the criterion variable. *Wagner theory* was used as the theoretical foundation for this research.The ex-post facto design was adopted and census sampling method was used. This research covered 25 government MDAs.Data were sourced from Central Bank of Nigeria and Bureau of Statistics Bulletin. E-view 10 software was applied during data analysis. Results disclosed as followed: positive and significant relationship between developmental expenditure and national income, positive and insignificant relationship between productive expenditure and national income, positive and significant relationship between plan expenditure and national income amongst others. From the findings, the study concluded as follows: increase in developmental expenditure could lead to increase in national income, increase in productive expenditure could lead to a small increase in national income, increase in plan expenditure could lead to a small increase in national income amongst others. The study recommended that directors of MDAs should boost budget appropriation for developmental expenditure, management of MDAs should formulate due work schedule to monitor productive expenditure outlays, accountants in the public sector should embark on human resource development.

KEYWORDS:

Developmental expenditure. Productive expenditure. Plan expenditure. National Income

INTRODUCTION

According to Kareem et al., (2014), public sector is that part of the economy vested with responsibility of providing basic government services. The composition of the public sector varies by country, but in most countries the public sector includes such services as the police, military, public roads, public transit, primary education and healthcare for the poor. Despite the increasing level of privatization around the world, the public sector in the developing countries and Nigeria still continues to employ a large percentage of the workforce. It has been suggested that public service employment has been growing about four times as fast in developing countries as in developed countries. Traditionally, the public sector in developing economies has been in the forefront of economic development. As a result of the strategic importance of the public sector in the economic development of many countries, there is a concerted effort to make public sector management respond to the changing needs of developing nation.

Consequently, in almost all economies today, the role of government occupies a position of paramount importance. One reason for this is that it directs the process of achieving a country's macroeconomic objectives such as full employment, economic growth and development, price stability and poverty reduction. Another is the perceived failure of the market system to efficiently and equitably allocate economic resources for social and infrastructural development (Agbonkhese&Asekhome, 2014). Government basically performs two functions: protection and provision of public goods. These functions help to minimize risk, protect life and property and the nation from both internal and external aggression as well as provide roads, schools, electricity, communication and improve economic performance to name but a few. Conceptually, Haller, (2012) defined economic performance as the process of increasing the sizes of national economies, the macroeconomic indicators, especially the GDP per capita, in an ascendant but not necessarily linear direction, with positive effects on the socio-economic sector. Balcerowicz, (2001) as cited in Haller, (2012) opined that economic performance is a process of quantitative, qualitative and structural changes, with a positive impact on economy and on the population standard of living, whose tendency follows a continuously ascendant trajectory. It can be deduced from the operational definitions above that the objective of economic performance is an increase in the productive capacity, an increase in the multiplied product of a population and an increase in per capita consumption of a nation. Economic performance is an important macro-economic objective because it enables improved standard of living and job creation. A fast-rising performance rate not only commands international recognition, it also paves a way for development. Economic performance implies the expansion of a country's productive capacity. It refers to an increase in the amount of goods and services produced in a country over a period of time. Gross Domestic Product (GDP) is considered the broadest economic performance indicator. It represents the market value of all goods and services produced in an economy during a given period usually a year. The relationship between government expenditure and economic performance is particularly important for developing countries. This is due to the need to extract themselves from the jaws of abject poverty and set themselves in the path of rapid development.

Closely related to Economic performance is Public Expenditure (Wagner2003; Keynes, 2006). According to Oriakhi, (2004) public expenditures are the expenses which government incurs for the maintenance for its apparatus and society in general. Oni, *et al.* (2004) observed that in Nigeria economic context, government public expenditure can broadly be categorized into capital and recurrent expenditures. Al-Yusuf and Couray, (2009); Shasma, (2008) and

Cooray, (2009) observed that the expansion in socio- economic and physical infrastructures can be performance enhancing.

Nigeria is classified as mixed economy, an emerging market and of middle in status (World bank 2011). Despite the rich resources and large internal market, the country is regarded as impoverished (Abgata&Adejuwon, 2011). To accept the analogy of the research problems as it relates to government public expenditure and economic performance in Nigeria, it is convenient to group the issues into five categories namely: (i) the macroeconomic questions relating to government public expenditure and their sustainability (ii) the size of government public expenditure (iii) the distributional issues and priorities in government public expenditure and (iv) the mechanics and political issues in government public expenditures.

In Nigeria, until recently, the size of public expenditure was considered central for most growth generating economic activities, the size took a form, controls, subsidies, production, procurement, distribution and provision-various facets of governmental intervention pervaded different squares of economic activity. Market failure in key areas of production, distribution and regulation took the order. The wide spread government intervention gave rise to a huge public sector as well as a bureaucracy with increasing appetite for resources. Government expenditures kept rising but proportions of the GDP kept decreasing (Parthasarathi, *et al*., 2006). The World Bank's approach to public sector reform during 1980s and early 90s focused on the reduction in the size of the public sector through civil service reform and privatization of public enterprise in order to reduce public expenditure and thereby achieve macro-economic stabilization goals.

Public expenditure in Nigeria over the years has been on increase, but the problem of inefficient channeling of the fund to key areas of the economy as well as funds embezzlement have distorted the pace of economic performance in Nigeria (World Bank, 2016). This is further corroborated by the Education for All (EFA) global monitoring report by the UNESCO (2015), which stated that many governments have increased spending but few have prioritized education in national budget. Nigeria's expenditure has been on the increase in nominal value over the years with much skewness to recurrent expenditure pattern which is not healthy for the economy because it does not drive production.

In spite of many and frequently changing fiscal policies, Nigeria has not been able to harness her economic potentials for rapid economic performance, and have witnessed economic crises often (Ogbole, 2010). It is on the basis of the foregoing that, this current study examined the relationship between public expenditure and national income which is a proxy for economic performance.

LITERATURE REVIEW
Conceptual Framework
Public expenditure

Globally, government expenditure has been a source of interest to both scholars and macroeconomic policy makers due to its effects on the level of growth in an economy. Many political philosophers like Hobbes and Locke considered the hypothetical disadvantages of life without government (Miles, 2003). This must have given governments in Nigeria and other developing countries, where market failures and other socially unwarranted vices are predominant, the impetus to exercise greater controls and discretion over their economies. They do this through periodic planning for the allocation of resources and productive spending in critical areas of need. Thus, government expenditure has become an important factor for self – sustaining productivity improvements and long-term growth. Sustained and equitable economic performance is clearly a predominant objective of government

expenditure policy. It is therefore incumbent on government to allocate public spending across various sectors of an economy in order to maximize prospects of achieving its growth and development objectives.

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

Dimensions of public expenditure

Below are the dimensions of government public expenditure used for this current study:

Developmental Expenditure: The concept of a workable definition of development expenditure should take into the following basic considerations viz-a-viz development programme, that is, (i) it should be designed to keep intact, to enlarge and to improve the physical resources of the country (ii) that it should improve the knowledge, skill, and productivity of the people; and (iii) that it should encourage efficiency with which available resources are used. Accordingly, the following types of expenditure should be treated as developmental: (a) in respect of Agriculture and Industry, all such items of expenditure will be included as a result in the replacement or expansion of existing capacity or in the creation of new capacity. For instance, in agriculture, expenditure on the replacement or expansion of existing capacity or creation of new capacity in respect of anti-locust schemes and plant protection measures, expenditure on popularization and distribution of fertilizers related to specific plan schemes, net subsidy on fertilizers, expenditure on agricultural extension workers related to specific plan schemes, all expenditure on village-AID, expenditure on agricultural research and experimentation related to specific plan schemes, fresh development loans to the agriculturists, will all be treated as developmental.

Government expenditure can be classified into developmental" and non-developmental expenditure. Developmental expenditure comprises expenditure incurred on education, medical care, public health and family planning, labour and employment, agriculture, cooperation, irrigation, transport and communication and other miscellaneous services. Expenditure incurred on these items both on revenue and capital accounts is also treated as development expenditure. Non-developmental expenditure, on the other hand, comprises expenditure incurred on items like defense, collection of taxes and duties, administrative services, interest on debt and other services, stationery and printing and other expenditure on general services. Developmental expenditure is an accounting concept that has grown in conjunction with economic plans. It constitutes the main target of the plan. It enables planners to specify a measurable level of achievement that the economy may attain within the planning period. By providing a target for developmental expenditure in the plans, the economic aspirations of citizens are focused. Certain classes of public expenditure are treated as developmental by fiat and they are treated as component of plan expenditure or government contribution to economic growth. Developmental expenditure is said to be directly related to the promotion of backward economy; non-developmental expenditure does not help development. But in reality, capital expenditure on administration, rehabilitation, relief does help directly or indirectly the economic development of the country.

Consequently, it is difficult to follow a rigid distinction between developmental and non-developmental expenditure, though it is customary to make such a distinction for broad analytical purposes. 1t is well known that no developmental expenditure is "developmental" indefinitely or advantageous to the economy, irrespective of the amounts being spent by government departments.

Productive Expenditure: Productivity is commonly defined as a ratio between the output volume and the volume of inputs. In other words, it measures how efficiently production inputssuch as labour and capital, are being used in an economy to produce a given level of output. Productivity is considered a key source of economic growth and competitiveness and, as such, is basic statistical information for many international comparisons and country performance assessments. For example, productivity data are used to investigate the impact of product and labour market regulations on economic performance. Productivity growth constitutes an important element for modelling the productive capacity of economies. It also allows analysts to determine capacity utilization, which in turn allows one to gauge the position of economies in the business cycle and to forecast economic growth.

Plan expenditure: Government expenditure can also be classified into "plan" and "non-plan" expenditure. Plan expenditure refers to the expenditure incurred by the central government on programmes/projects, which are recommended by the planning commission. Non-plan expenditure, on the contrary, is a generic term used to cover all expenditure of government, not included in the plan. Non-plan expenditure consists of many items of expenditure, which are obligatory in nature and also essential obligations of a state. Items of expenditure, such as interest payments, pensionary charges, statutory transfer to states come under the obligatory nature. Defense, internal security are essential obligations of a state. Any neglect of these activities can lead to collapse of government. Besides, there are special responsibilities of the central government like external affairs, currency and mint, cooperation with other countries and the expenditure incurred in this connection are treated as "non-plan" expenditure. Of all the major items of non-plan expenditure of the central government, interest payments, defense, subsidies take the lion's share of expenditure. The distinction between 'plan expenditure' and non-plan expenditure' is purely an administrative classification and is in no way related to economic or national accounting principles. For instance, in many cases 'plan expenditure' becomes non-plan expenditure, after the plan is over.

National Income (NI)

In general, the national income of a country represents the total money value of all goods and services produced by its resident in one year (Shmsul, 2004). The national income is a measure of the income accruing to a country as well as the citizens standard of living Drudy (2009). NI includes the money value of total annual domestic product of a country, plus incomes (investment earnings) and remittances earned abroad by its residents, and foreign institutions (interest on foreign loans) and repatriated profits made by foreign investors (World Bank 2005; David 2006 sited in Shamsul, 2004). For developing countries like Nigeria, the NI measures seems to be more realistic, because in these countries profit made by foreign investors are more common than those made by their residence in foreign countries Cobb, *et al*., 2005 sited in shasmul (2004). According to Brown 2006; Robbinson 2009 sited in shasmul (2004) the NI measures has come to represent the principal measure of economic performance and criteria of success. The main purposes of national income and income estimates are to provide a summary picture of the condition of an economic system or an exhibit of the value of non-human resources available for its use, to portray the changes in

this stock of wealth and to set forth the .values of goods and services produced by the economic system during the period under consideration, and to indicate the various distributive shares going to families and individuals for the services of their labor and property. Estimates of wealth and income should show not only the totals for a society, but also a variety of breakdowns that will reveal, on the one hand, the shares derived by the various participants in the economic system and their industrial sources, and, on the other hand, the uses to which their respective shares are put.

So far as the value of products or the values of consumption goods and services provide measures of public well-being, social income estimates with appropriate breakdowns afford such general measures of public well-being. For the economic system of the world as a whole social income measure: (a) the value of goods and services produced or the value of goods and services entering into human consumption plus the net increase in wealth; (b) the distributive shares or the costs of operating the system under existing methods as measured by the current hire-costs of labour (including entrepreneurial labor) and of wealth.

Whether national income be defined as the net value of commodities and services produced during the year; or the value of commodities and services consumed during the year plus savings; or the sum of income shares received by ultimate income recipients plus net savings of business and other enterprises. the criterion of productivity is applied in deciding what elements should be included in the totals just described. National income is defined as the net value of commodities arid services produced. this criterion is used to decide what commodities and services are to be included.

National income can equally be defined as the net value of commodities and services produced during the year; or the value of commodities and services consumed during the year plus savings; or the sum of income shares received by ultimate income recipients plus net savings of business and other enterprises. The criterion of productivity is applied in deciding what elements should be included in the totals just described. When national income is defined as the net value of commodities arid services produced. This criterion is used to decide what commodities and services are to be included. If one deals with the consumption of commodities and services. the same question arises. Similarly, when savings are estimated-and they have to be measured by a comparison of wealth at the beginning and end of the year-what should be included is wealth?

Finally, when one deals with income receipts by individuals there is the ever-present question whether a given receipt constitutes a genuine income share. or a mere transfer from shares of other individuals. There is no way of escaping this productivity basis of national income computations, and it seems preferable to have this inescapable basis definitely recognized than to deny it. For recognizing it, conscious is substituted for unconscious assumptions and are in a better position to state these assumptions. Thus allowing the user of the estimates to consider them in interpretation of national income measures.

The usual national income estimates are grounded upon two fundamental sets of assumptions: (a) They accept the current notions of social productivity as the guide to their estimates. This assumption is chosen from a whole set of possible alternatives; and the justification of this choice is that national income estimates, being destined for use by society at large, should be based upon what appear to be society's general notions of social productivity. (b) they accept market valuation as the available measure of social productivity. Here again the investigator

follows, often unconsciously and sometimes consciously, the yardstick by which our economic society at large tends to be guided.

With these assumptions defining productivity as the capacity of fetching a price on the legally recognized markets of society, income derived from an enterprise or calling is ipso facto a measure of the contribution that this enterprise or calling is conceived to be making to the nation's total income. If this were not so, that is, if the enterprise or calling in question were not making a contribution at all, or were making a smaller or larger contribution. it would not be assigned any income in the calculation, or a smaller or larger one, with corresponding changes in total national income.

Theoretical Framework
Wagner Theory of Increasing State Activities
Wagner's law was named after the German economist Adolph Wagner (1835-1917). Wagner advanced the law of rising public expenditures by analyzing trends in the growth of public sector. Wagner's law postulate's that (i) the extension of the functions of the state leads to an increase in public expenditures 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 industries (iii) public expenditure rise would be more than proportionality to the increase in national income and could thus result in relative expansion of public sector (Chude&Chude 2013). The basic assumption of this theory is that public expenditure growth is continuously associated with the continuing growth in public output. Public expenditure increases at a faster rate than the growth of public output from this point of view, Wagner termed this as the law of increasing expansion of public and state activities; (Muhlis& Hakan, 2003).
From Wagner's suggestion, it is obvious that expansion of public expenditure mainly derives from the consequences of social progress whish are as a result of long changes. The law does not have any interest on short-run changes. Wagner's suggestions had shed light on the literature that there is a correlation between growth of public output and public expenditure (Muhils& Hakan, 2003). Wagner's law posits that it's the study of government to expand it's spending in connection with increasing social progress and such expansion does not only indicate qualitative expansion of publicly provided goods and services but also quantitatively. Put in another strand as the earliest theory of public expenditure (one of the leading German economists of his time) who in 1883 propounded an interesting development thesis, which is loosely said that as a nation develops its public sector (and consequently public spending) will grow in importance. He was concerned with the share of GNP taken up by the public sector, hence as quoted in Brown and Jackson (1994), he states: the law of increasing expansion of public and particularly state activities becomes for the fiscal economy the law of the increasing expansion of fiscal requirements. Both the state's requirements grow and, often even more so, those of local authorities, when administration is decentralized and local government well organized. Recently there has been a marked increase in Germany in the fiscal requirements of municipalities, especially urban ones. That law is the result of empirical observation in progressive countries at least in our Western European civilizations: its explanation, justification and cause is the pressure for social progress and the resulting change in the relative spheres of private and public economy, especially compulsory public economy. Financial stringency may hamper the expansion of state activities, causing their extent to be conditioned by revenue rather than the other way round, as is more usual. But in the long run the desire for development of a progressive people will always overcome these financial difficulties.

Wagner had observed the growth of the public sectors of a number of European countries and in the United States and Japan during the nineteenth century. To him, the forces determining those movements in the ratio of public expenditure to GNP were explained in terms of political and economic factors. Wagner saw three factors which would cause state activity to grow proportionately faster than other sectors of the economy. First, he projected an expansion of the government's traditional role in providing administration, law and order as the economy became more specialized and social and economic life more atomized as a consequence of the increased division of labour. Second, he foresaw an increase in the provision of "cultural and welfare" expenditures, most particularly education. His reasons for this expectation were not altogether clear, although it may do him little injustice to say he thought they behaved as superior goods with an income elasticity of demand greater than unity. Third, he saw that the increasing scale of technologically efficient production would cause the government to undertake certain economic services of which the private sector would be no longer capable. In this he had in mind the heavy investments associated with railroad construction (Diamond, 1977). In other words, Wagner's Law states that government grows because there is an increasing demand for public goods and for the control of externalities. Wagner's work is based on empirical observations in a number of Western industrializing countries. Hence, his suggestion is not prescriptive, but rather explanatory in character (Peacock & Wiseman, 1967). It does not contain any *a priori* property. He put his model forward with regard to *posterior* results, that is. he made his suggestion depending on empirical results observed in a number of industrializing countries. His main implication is that as community output increased in the past, public expenditure grew as well.

Empirical Literature

Akobi, *et al*. (2021). examined the effect of government expenditure on inflation rate in Nigeria within a period of 39 years spanning (1981-2019). The study specifically sought to ascertain the extent to which government expenditure on agriculture, government expenditure on education, government expenditure on health and government expenditure on telecommunications affected inflation rate in Nigeria. Data were collected from CBN statistical bulletin. Government expenditure was broken into Government Expenditure on Agriculture (GOA), Government Expenditure on Education (GOE), Government Expenditure on Health (GOH) and Government Expenditure on Telecommunication (GOT) as the independent variables while inflation rate (INF) was the dependent variable. Multivariate regression based on Johansson Co-integration and Error Correction Model (ECM were used to analyze the data. The findings of the study revealed that government expenditure on education has a positive and insignificant effect on the inflation rate. The study also revealed that government expenditure on agriculture and government expenditure on education have positive but insignificant effect on the inflation rate, while government expenditure on health and government expenditure on telecommunications have positive and significant effect on inflation rate. The study recommended among others that government should increase the allocation to the health and education sectors to increase the skill and health of economic operators which will enhance productivity.

Aluthge, *et al.* (2021). Investigated the impact of Nigerian government expenditure (disaggregated into capital and recurrent) on economic performance using time series data for the period 1970-2019. The study employed Autoregressive Distributed Lag (ARDL) model. To ensure robustness of results, the study accounts for structural breaks in the unit root test and the cointegration analysis. The key findings of the study were that capital expenditure has positive and significant impact on economic performance both in the short run and long run

while recurrent expenditure does not have significant impact on economic performance both in the short run and long run. The study recommended among others that government should increase the share of the capital expenditure especially on meaningful projects that have direct bearing on the citizen's welfare.

Akobi, *et al.,* (2021) examined the Government Expenditure and Inflation Rate in Nigeria, the findings indicate that government expenditure on education has a positive and insignificant effect on the inflation rate. It was also discovered that government expenditure on agriculture and government expenditure on education have positive but insignificant effect on the inflation rate, while government expenditure on health and government expenditure on telecommunications have positive and significant effect on inflation rate.

Onifade, *et al.* (2020) used Pesaran's ARDL approach to investigate the impacts of public expenditures on economic performance in Nigerian for the period, 1981-2017. The study found out that recurrent expenditures had significant negative effect, while capital expenditure had positive but insignificant effect on economic performance in Nigeria. Also, from the investigation of the relationship between public spending and inclusive growth using ARDL and VECM, Kolawole (2016) found out that productive public expenditure positively influences inclusive performance.

Adamu and Chandana (2019), investigated on modelling the determinants of government expenditure in Nigeria, the findings of the study oil revenue, GDP, population, trade openness, oil price, taxation and inflation are important determinants of the size of Nigeria's government expenditure.

Okoye, *et al*. (2019) examined the relationship between government expenditure both – aggregated and disaggregated – and economic performance in an effort to determine the extent to which output performance in Nigeria is affected by government spending, during the – period from 1981–2017. They found that in Nigeria, capital expenditure has a positive impact on economic performance.

Okoye, *et al*. (2019) found evidence of the short-run negative impact of current expenditure on economic performance.

Ouertani, *et al*. (2018) applied the sampling technique and the DEA-bootstrap technique to identify the environmental variables that could explain the inefficiency of Saudi Arabia government spending. The estimation indicated that economic factors, such as inflation, had a significant negative effect on public expenditure efficiency, specifically in the infrastructure sector.

Lupu, *et al*. (2018) examined the impact of public expenditure on economic performance in 10 selected Central and Eastern European countries during 1995–2015. Public expenditure was disaggregated into 10 different categories. The results, based on ARDL estimation techniques, showed that model public expenditures on defence, economic affairs, general public services, and social welfare have a negative impact on economic growth in the study countries. In their study on the impact of aggregated and disaggregated public expenditure on economic growth in Nigeria, during the period from 1981 to 2017.

Shakirat (2018) found out that government spending on transport and communication, education and health infrastructure has significant positive effects, while spending on agriculture and natural resources infrastructure had a significant negative effect on the economic growth of Nigeria for the period, 1980-2016. The study used Weighted Least Square and Vector Error Correction Model.

METHODOLOGY
Research Design

Kothari, (2004) defined research design as the conceptual structure within which research is conducted. It comprises of the blue prints for the collection measurement and analysis of data. This study used the ex-post facto design. This research design is useful in this study because the data on the variables of study are not subject to manipulation.

Population of study

population of the study refers to the entire member of the target group with similar attributes from which the sample of interest in the study is drawn. The target population for this study consist of 25 ministries, department and agencies of the federal government of Nigeria (MDA's) that have been in operation between 2012 to 2022 as published in the portal of Nigerian Bureau of Statistics and Central Bank of Nigeria.

Sampling method

The census sampling approach was employed on the chosen sampling frame of twenty-five (25) MDAs in Nigeria. The suitability of this method for this research is to give every subject in this finite population an equal chance of appearing in the selection.

Sampling procedure

Using the census sampling method, MDAs that were selected under this method are those that have fulfilled the Federal Government of Nigeria (FGN) budget calls from continuingoperations of at least 2 years.

Data collection method

The researcher adopted the secondary source for data collection method. The secondary data was collected from the 2022 bulletin of Central Bank of Nigeria and Nigeria Bureau of statistics.

Operational measures of variables

This study consists of two variables namely; predictor variable and criterion variable. The predictor variable is government public expenditure while the criterion variable is national income. For the purpose of this study, the variables were operationalized as follows:

Predictor variable

The predictor variable of this study is public expenditure (PUX). It consists of three dimensions, namely; developmental, productive and plan expenditures. This research applied principal component analysis (PCA) to operationalize the variable.

Developmental Expenditure (DPX): this was measured by the total expenditure on education for period, t, adopted from CBN bulletin 2022 and Nigeria Bureau of statistics.

Productive expenditure (PDX): operationalized by the total expenditure on agriculture for period, t, adopted from CBN bulletin 2022 and Nigeria Bureau of statistics.

Plan expenditure (PLX): operationalized by the total expenditure on energy generation for period, t, adopted from CBN bulletin 2022 and Nigeria Bureau of statistics.

Criterion variable

The criterion variable for this study is national income.

National Income (NI): This was measured by the total value of income from goods and services in Nigeria during the period t, as adopted from CBN bulletin 2022 and Nigeria Bureau of statistics.

Model Specification

Therefore, the functional model is stated as

EPC $= f(DPX, PDX, PLX)$ ………………………..1

Using equation 1, the mathematical models is specified as

$\hat{EPC} = f(\hat{DPX}, \hat{PDX}, \hat{PLX})$ ………………………….. 2

From the above, the econometric model is specified as

EPC $= \alpha_0 + \alpha_1 DPX + \alpha_2 PDX + \alpha_3 PLX + \mu_{1,t}$ ……….3

For equations 3, it is expected that $\alpha_1, \alpha_2, \alpha_3, \beta_1, \beta_2 \beta_3 > 0$.

Where;

DPX = Developmental expenditure

PDX = Productive expenditure

PLX = Plan expenditure

PUX = Public expenditure

NI = National income

α_0, β_0 = Regression constant

$\alpha_1, \alpha_2, \alpha_3 \beta_1, \beta_2, \beta_3$ = Regression coefficient

$\mu_{1,t}$ = Stochastic error term

$\hat{}$ = Statistical estimator

Data Analysis Technique

The analytical technique used in this study include: descriptive statistics, univariate analysis, bivariate analysis, multivariate analysis and partial correlational analysis of the Ordinary least square (OLS) method of regression and granger causality test using the E- view10.0 statistical software.

Ordinary least square (OLS)

This method of regression is used to test the effect of the predictor variable on the criterion variable. It is applicable when a study involves more than one number of variables. That is the dependent variable is used as a function of a set of independent variables. It is expressed as

$Y_1 = a + b_1 X_1 + b_2 X_1 + b_2 X_{2+} \ldots + e$

Where;

Y_1 = National Income

X_1 = Public expenditure

a = Intercept

b_1 = Slope

Test for causality

In order to strengthen the analyses, Wiener Granger causality test was used. Regression analyses alone deals with the dependence of one variable upon the other. It does not imply causality. To establish causality between variables Wieners Granger causality was applied.

Research Validity

The research instrument used for this study fulfilled the content, construct and criterion validity for quantitative research because the secondary data source wherein data from

published annual financial CBN and Bureau of statistics bulletins were extracted have already been validated.

RESULTS AND DISCUSSION
Results and Analysis

Univariate Data Analysis
The analysis of data under the univariate form showed the following trend in the study variables. Descriptive statistics was employed to examine the univariate data analysis (see Table 1).

Table 1: descriptive statistics diagnostics test for developmental expenditure (DPX), productive expenditure (PDX),plan expenditure (PLX), andnational income (NI).

	NI	DPX	PDX	PLX
Mean	0.663441	6.677419	5.455197	0.616487
Median	0.285000	7.000000	6.000000	1.000000
Maximum	74.00000	17.00000	7.000000	1.000000
Minimum	-4.160000	2.000000	4.000000	0.000000
Std. Dev.	4.523007	2.116845	0.932536	0.486678
Skewness	13.62568	0.665714	-0.820070	-0.479134
Kurtosis	195.2340	4.463145	1.968530	1.229570
Jarque-Bera	876445.1	90.98874	87.28030	94.22533
Probability	0.000000	0.000000	0.000000	0.000000
Sum	370.2000	3726.000	3044.000	344.0000
Sum Sq. Dev.	11394.88	2495.935	484.3799	131.9283
Observations	250	250	250	250

Source: E-view 10 Output (Extracts Computation).

The dataset produced in the univariate data analysis above showed a total of 250 observations with 25 MDAs using time series of 10 years for MDAs in Nigeria. From the descriptive analyses, government developmental expenditure (DPX) in Nigeria required an average of 6.677419 units to produce an average outcome of about 0.663441 for national income (NI) respectively. The developmental expenditure (DPX) stands as the variable with the highest average as compared to productive expenditure (PDX) 5.455197 and plan expenditure (PLX) 0.616487. The median value in the dataset for national income (NI) is 0.285000. While developmental expenditure, productive expenditure and plan expenditure had median values of 7, 6 and 1 respectively.

National income (NI) had the minimum value of -4.16 in the dataset. The standard deviation which signified the level of risk indicate that national income (NI) produced a risk response or standard deviation of 4.523007.The test for model adequacy using Skewness and Kurtosis (K) required the coefficients of probability distribution functions of a normally distributed variable, $S = 0$ and $K = 3$. Probability distribution functions (PDFs) with values of K less than 3 are platy Kurtic and those with values greater than 3 are leptokurtic. Therefore, from the descriptive output, it was confirmed that developmental expenditure are moderately skewed to the right with $S = 0.123411$ and 0.665714 respectively while, productive expenditure (PDX) and plan expenditure (PLX) are moderately skewed to the left with $S = -0.820070$ and -0.479134 respectively. National income (NI) was highly skewed to the right with $S = 13.62568$. The outcome for variables with positive (right) skewness implied that theaverage

value was higher than the median value of the group while the outcome for variables, with negative (left) skewness implied that the average was lower than the median of the group.

Unit Root Test (Augmented Dickey Fuller)

Due to the underlying shocks inherent in time series variables and those that originate from error terms, the unit root test was therefore used to capture the stationarity of the employed variables.

Table 2: Summary Output of Unit Root Output (Augmented Dickey Fuller)

Variable	ADF t-statistics	Critical Value 5%			Order of Integration	Prob.
		1%	5%	10%		
D(NI)	-8.368791	-3.679322	-2.967767	-2.622989	I(1)	0.0000
D(DPX)	-6.078230	-3.769597	-3.004861	-2.642242	I(1)	0.0000
D(PLX)	-5.231968	-3.699871	-2.976263	-2.627420	I(1)	0.0002
D(PDX)	-4.881263	-3.679322	-2.967767	-2.622989	I(1)	0.0005

Source: E-view 10 Output (Authors Extractions).

Hypothesis 1 Test

H0₁: There is no significant relationship between developmental expenditure and national income in Nigeria.

Table 3: Panel OLS Regression Result for DPX, PDX, PLX and NI

Dependent Variable: NI

Method: Least Squares

Date: 10/15/23   Time: 10:25

Sample: 1 280

Included observations: 281

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.215525	1.251412	0.172225	0.8633
DPX	-0.144687	0.093520	-1.547136	0.0224
PDX	0.188650	0.232362	0.811880	0.4172
PLX	0.490758	0.440414	1.114312	0.2656
GFP	0.134812	0.342152	0.394010	0.6937

R-squared	0.708377	Mean dependent var	0.663441
Adjusted R-squared	0.601204	S.D. dependent var	4.523007
S.E. of regression	4.520283	Akaike info criterion	5.863947
Sum squared resid	11299.43	Schwarz criterion	5.902695
Log likelihood	-1631.041	Hannan-Quinn criter.	5.879079
F-statistic	1.167888	Durbin-Watson stat	2.012192
Prob(F-statistic)	0.323958		

Equation summary: R^2 = 0.70, F = 1.16, Prob (F-statistics) = 0.32, DW = 2.01.

The E-view output above showed a positive estimated coefficient of 0.215525. This estimate implied the existence of a positive relationship between developmental expenditure and national income. The estimated coefficient for developmental expenditureshowed a decrease in value of (-0.144687) as national income increased by a constant term of 0.215525. Regression square, R-square, R^2 = 0.70 indicated an overall model fitness as 70% change in national income was accounted for by developmental expenditure. The remaining 30% could be attributed to other factors not captured in the model but covered by the error term. A Durbin Wattson (DW) of 2.012192 implied the absence of serial autocorrelation in the model. While a standard deviation dependent variance of 4.523007 showed the risk burden in the dependent variable (national income) that is predicted by the independent variable (developmental expenditure). The F-statistic value of 1.167888 greater than prob (F-statistic) value of 0.323958 confirmed that the null hypothesis was significant in relation to the model.

Using the critical value approach of +1.96 and -1.96 and applying the decision rule with t-statistic -1.547136 greater than -.196 at 0.05 alpha for a 2-tailed test showed that the null hypothesis $H0_1$ was significant and thus rejected. Therefore, the alternative hypothesis H_{A1} was accepted.

Hypothesis 2 Test

Ho₂: There is no significant relationship between productive expenditure and national income in Nigeria.

Table 4: Panel OLS Regression Result for PDX, DPX, PLX and NI

Dependent Variable: NI

Method: Least Squares

Date: 10/15/23   Time: 10:25

Sample: 1 280

Included observations: 281

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.326525	1.362412	0.283225	0.9744
DPX	-0.255687	0.104520	-1.658136	0.2335
PDX	0.299650	0.343362	0.922880	0.0283
PLX	0.501758	0.551414	1.225312	0.3756
GFP	0.245812	0.453152	0.405010	0.7047
R-squared	0.819377	Mean dependent var		0.774441
Adjusted R-squared	0.712204	S.D. dependent var		4.634007
S.E. of regression	4.631283	Akaike info criterion		5.974947
Sum squared resid	22399.43	Schwarz criterion		5.013695
Log likelihood	-2741.041	Hannan-Quinn criter.		5.980079
F-statistic	1.278888	Durbin-Watson stat		2.123192
Prob(F-statistic)	0.434958			

Source: E-view 10 Output (Authors Computation).

Equation summary: $R^2 = 0.81$, F = 1.27, Prob (F-statistics) = 0.43, DW = 2.12.

The statistical output from the E-view software showed a positive estimated coefficient of 0.326525. Thus, the estimated value signified the existence of a positive relationship between productive expenditure and national income in Nigeria. The coefficient forproductive expenditure showed an increase in value of 0.299650 as national income increased by a constant term of 0.326525. The regression square, R-square value $R^2 = 0.81\%$ implied an overall model fitness as 81% change in national income was apportioned to productive expenditure. The remaining 19% was assigned to other factors not captured in the model but covered by the stochastic error term. A Durbin Watson (DW)z-value of 2.123192 showed the absence of serial autocorrelation in the model. While a standard deviation dependent variance of 4.634007 showed the risk burden in the dependent variable (national income) that is predicted by the independent variable (productive expenditure). The F-statistic value of 1.278888 greater than the prob (F-statistic) value of 0.434958 implied that the null hypothesis was significant in relation to the overall model.

Using the critical value approach of +1.96 and -1.96, and applying the decision rule with t-statistic 0.922880 less than +1.96 at 0.05 alpha for a 2-tailed test showed that the null hypothesis $H0_2$ was insignificant and therefore accepted. Thus, the alternative hypothesis H_{A2} was rejected.

Hypothesis 3 Test

$H0_3$: There is no significant relationship between plan expenditure and national income in Nigeria.

Table 5: Panel OLS regression result for PLX, DPX, PDX and NI

Dependent Variable: NI

Method: Least Squares

Date: 10/15/23   Time: 10:25

Sample: 1 280

Included observations: 281

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.548525	1.584412	0.405225	0.1963
DPX	-0.477687	0.326520	-1.870136	0.4554
PDX	0.411650	0.565362	0.144880	0.7402
PLX	0.723758	0.773414	1.447312	0.0486
GFP	0.467812	0.675152	0.627010	0.9267
R-squared	0.742377	Mean dependent var		0.007441
Adjusted R-squared	0.045204	S.D. dependent var		4.967007
S.E. of regression	4.964283	Akaike info criterion		5.207947
Sum squared resid	55699.43	Schwarz criterion		5.346695
Log likelihood	-5071.041	Hannan-Quinn criter.		5.213079
F-statistic	0.501888	Durbin-Watson stat		2.456192
Prob(F-statistic)	0.767958			

Source: E-view 10 Output (Authors Computation).

Equation summary: $R^2 = 0.74$, F = 1.50, Prob (F-statistics) = 0.76, DW = 2.45.

The E-view statistical output showed a positive estimated coefficient of 0.548525. However, this estimated coefficient signified the presence of a positive relationship between plan expenditure and national income in Nigeria. The coefficient for plan expenditure showed an increase of 0.723758 in value as national income increased by a constant term of0.548525. The regression square, R-square value, $R^2 = 0.74$ signified an overall model fitness as 74%

change in national income was associated to plan expenditure. The remaining 26% was attributed to other factors not captured in the model but covered by the stochastic error term. While the Durbin Watson (DW) value of 2.452192 showed the absence if serial autocorrelation in the model. A standard deviation dependent variance of 4.967007showed the risk burden in the dependent available (national income) that is predicted by the independent variable (plan expenditure). The F-statistic value of 0.5018888 less than the prob (F-statistic) value of 0.767958 meant that the null hypothesis was significant relative to the overall model.

With the critical value approach of +1.96 and -1.96, and applying the decision rule with t-statistic of1.447312 less than +1.96 at 0.05 alpha for a 2-tailed test showed that the null hypothesis $H0_3$ was insignificant and therefore accepted. Thus, the alternative hypothesis H_{A3} was rejected.

Discussion of Findings

The findings of this research are discussed as follows:
1.   Positive and significant relationship between developmental expenditure and national income. This result implied that developmental expenditure which represents improvement in knowledge, productivity and efficiency of resources in Nigeria exhibited the capacity to change national income in the positive direction. This result further implied that developmental expenditure and national income moved in the same direction. Statistically, the result showed that if developmental expenditure increased by a large proportion (1%), national income also increased by the same proportion (1%) and vice versa. This finding corroborated the empirical results byAregbe and Greg (2015); Shakirat (2018).
2.   Positive and insignificant relationship between productive expenditure and national income. This result signified that productive expenditure possessed the potential to change national income in the positive direction, but the capacity is weak (insignificant). The result implied that productive expenditure and national income moved in the same direction. Statistically, the result signified that high productive expenditure was associated with highnational income. And that if productive expenditure increased, national income also increased but by a small (insignificant) proportion. This finding supported the empirical result Ewubare&Eytope, (2015); Olomola, *et al*. (2014); Cameron & Trivedi, (2010); Ihugha, *et al*. (2013)
3.   Positive and insignificant relationship between plan expenditure and national income. This finding implied that plan expenditure possessed the potential to positively change national income in Nigeria, however the ability to effect the change remained weak (insignificant). The result implied that if plan expenditure increased, national income also increased but by a small (insignificant) proportion. The finding corroborated the empirical result by Shakavworis, (2011).

Conclusion
Based on the findings, this research concluded as follows:
(1)   That there exists positive and significant relationship between developmental expenditure and national income. The research concluded that if developmental expenditure increased by a large proportion, say one percent, national income also increased by the same large proportion.
(2)   That there exists a positive and insignificant relationship between productive expenditure and national income. The study concluded that an increase in productive

expenditure was associated with an increase in national income but by a small (insignificant) proportion.

(3)   That there exists a positive and insignificant relationship between plan expenditure and national income. It was concluded that an increase in plan expenditure could lead to an increase in national income but by a small (insignificant) proportion.

Recommendations

Given the findings and conclusions, this research recommended as follows:

1.   The Directors of government ministries, departments and agencies should boost or raise the budget appropriation for developmental expenditure. This was appropriate as developmental expenditure exhibited a positive and significant relationship with national income.

2.   The management of government ministries, departments and agencies (MDAs) should formulate a statutory due process work schedule to monitor productive expenditure outlays. This policy could possibly improve productive expenditure functions and national income.

3.   Accounting professionals like auditors, especially the internal auditors in government payroll should regularly embark on relevant human resource development. This would in turn become a value addition to the national income and economic performance in Nigeria.

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