



EFFECTS OF SELECTED MACROECONOMIC VARIABLES ON PUBLIC EXPENDITURE IN NIGERIA.

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Abstract

Public expenditure is a major instrument for intra-sectoral resource allocation since the expenditure translates into the demand and supply of commodities. Also, public expenditure carries very serious implications for stability, growth and development of the economy. Thus, social welfare and distributive justice are seriously implicated. Against this background, the study examined empirically the nexus between public expenditure and some selected macroeconomic variables in the Nigerian economy. The main objective of this study was to examine the relationship the effect of some selected macroeconomic variables on public expenditure in Nigeria. The study adopted the co-integration and error correction mechanism for analysis. Findings revealed that external reserves have significant and positive effect on public expenditure. External debt and money supply have significant and positive effects on public expenditure. Also, 1 period lagged exchange rate has positive but insignificant impact on public expenditure. Thus, the study recommended that diversification of economy should be a deliberate strategy in order to enhance non-oil revenue so as to share up external reserves continually. Export promotion policies should be formulated and vigorously pursued. There is a need to consolidate on the gains of debt relief and ensure that huge accumulation of external debt does not arise again. The Debt Management Office should remain highly professional and independent of executive influence in the management of the government's debt profile.

Keywords: Macroeconomic Variables, intra-sectoral resource allocation Public Expenditure

JEL Classifications:

Introduction

The study of public expenditure is rooted in the theory of public finance. Fundamentally, public finance is a tripodal study that firmly rests on the interactions of public revenue, public expenditure and their implications for the wellbeing of the society. Public expenditure received scanty attention in the hands of economic writers on public finance throughout the 19th century, Amadi (2004). Public expenditure was not significant because government activities were limited as proposed by Adam Smith.

It is remarkable to note that as from the 20th century public expenditure started receiving serious attention to the present time because scholars and researchers came to realize that public expenditure seems to have far more implications than public revenue. In the light of this, Agiobenebo (2004) surmised that public expenditure is a priority instrument of intra-sectoral

resource allocation with implications for global influence on the allocation of resources in the economy, since the expenditure translates into the demand and supply of commodities. Furthermore, he added that given its influence on the demand and supply patterns in the economy, public expenditure carries serious implications for stability, growth and development of the economy. Hence, the social welfare and distributive justice are directly implicated. The great depression of the 1930s nearly paralyzed the American economy and revealed fatal weaknesses of the market economy. However, the country was able to bounce due back due to the application of Keynesian functional finance approach which brought the American economy out of the woods. Whenever there is incidence of market failure, a situation whereby market cannot allocate resources efficiently, that is, when the conditions of Pareto-optimality are not satisfied, it behoves the

government to intervene so as to ensure that Pareto-optimality is satisfied by correcting for distortions Onoh (2007). A major fall out of the world economic depression years was that government expenditure policy came to the front burner.

Basically, government has two major roles to play in the economy; they are to maintain law and order as well as provide public goods, Taiwo and Agbatogun (2011). In economic literature, there are two strands of arguments on the impact of public expenditure on the behaviour of macroeconomic variables. At the realm of theoretical plane, some scholars argue that a larger government size may adversely affect efficiency and economic growth. This argument is based on the fact that government operations often take place inefficiently. Also, it is argued that government regulatory process places excessive burdens and costs on the economic system. On the other side of the argument are scholars who are of the opinion that increase in government expenditure promotes economic growth and development. Buttressing this position is the fact that increased government expenditure in electricity and the power sector may result in cost reduction and increase the profitability of firms. Ekpo (1994) argued that public expenditure plays significant roles in the functioning of an economy at all levels. Traditionally, public expenditure's macroeconomic role is to stabilize the economy in conjunction with other policy instruments in an integrated package approach. A cursory look at the literature review revealed that there is a correlation between government expenditure and government debt in the economy. An increase in deficit spending by government also brings an increase in the amount of debt. Whenever government spends more than its receipts, its decision to borrow funds to bridge the deficit will crowd out other

Literature Review

Public expenditure is the expenses which the government incurs for the maintenance of itself and the society generally. Government expenditure therefore includes spending on payment of salaries (civil servants and members of the armed forces) construction and maintenance of highways, education, public health, assistance to other countries, e.t.c. Macroeconomic variables are indicators of performance that can assume any number (or value) at the macro level, for instance, (BOP) figures, inflation rate, exchange rates, employment rates, sustained growth rate and so on. In Smithian parlance, the market system has inbuilt flexibility that counters distortions. However, the system has limitations and inefficiencies that generate market failure. The great

interest borrowers (private investors) and by extension increase the cost of capital.

Available data from the CBN Statistical Bulletin sources (2010, 2015) indicate that for the past twenty five years, public expenditure has been rising. For instance, total government expenditure (Capital and recurrent) in 1990 was N 24,048.6m and N 36,219.6m. This increased to N 23,945.09m and N46, 160.0m in 2000. By 2009, it has increased to N 1,152, 796.6 billion and N 2,131, 900 billion. In recent times public budgets are in trillions of naira in Nigeria; in 2009, it was 3.049 trillion naira, 4.69 trillion naira in 2014 and 7.298 trillion naira in 2017. The stark reality on ground indicates that in spite of huge public expenditure, the Nigerian economy is still plagued with overhang of underdevelopment burdens.

Springing from the issues raised above and the fact that there is an unending debate on the effects of some macroeconomic variables on public expenditure, the main objective of this paper is to examine the effects of the behavior of some selected macroeconomic variables on public expenditure in Nigeria. In order to achieve the above objective, the following questions are germane to the study. What is the nature of the relationship between external reserves, external debt, money supply and exchange rate and public expenditure? To what extents have external reserves, external debt, money supply and exchange rate impacted on public expenditure in Nigeria? To answer the above stated questions, the remaining part of the paper is structured as follows; section 2 presents conceptual clarification, historical overview and literature review. The theoretical framework is presented in section 3, the details of the data and methodology used in the paper are presented in section 4. The empirical results and their economic implications are discussed in section 5 while section 6 concludes the paper.

depression of the 1930s lend credence to the fact that the invisible hand sometimes need to be strengthened by strict intervention by the government thus the coming on board of Keynesian economics. Obademi (2012) investigated the interactions between government surplus, debt accumulation and private dynamics. They observed that so-called Keynesian features of fiscal and monetary shocks and consistent with the prediction of the fiscal theory of price level as regards price dynamics. In economic literature, foreign reserves provide a formal backing for the domestic currency. It is also required to service foreign currency availabilities such as debt service obligations. Besides, foreign reserves are necessary to protect the economy from the volatility of terms-of-trade shocks. All of the above boils down to the fact

that an increase in foreign reserve will propel the government to possibly embark on more public expenditure in order to achieve efficient intersectoral allocation. According to CBN (2003), exchange rate being a monetary instrument, its interaction with other monetary variables such as the money shock, interest rate, foreign reserve and liquidity conditions are crucial to the achievement of macroeconomic stability. Public expenditure being a tool for sectoral resource allocation has serious implications for macroeconomic stability. Thus, the link between exchange rate and public expenditure is routed through importation and payment of external liabilities.

In economic literature, several scholars for instance Amadi (2004) and Musgrave (1989) advocate for government intervention as it help in wiping distortions from the system. Akpan (2005) on examined the contributions of public spending to economic growth in Nigeria using data from 1960-1990. The study concluded that infrastructural spending crowded in private investment and triggers growth. In their study of the relationship between public expenditure and growth, Fajingbesi and Odusola (1999) surmised that real government recurrent expenditure has more significant influence on growth than real government capital expenditure. In a study of disaggregated approach to determine the effect of government expenditure on economic growth, Akpan (2005) concluded that there is no reasonable relationship between the components of government expenditure and growth. Diamond (2012) studied the analysis of the long-run relationship and impact of debt from the perspective of the value impact and proportional impact on the Nigerian economy. The author used value impact variables such as external debt, domestic debt and budget deficit. The result revealed that the joint impact of debt in the long run depressed growth as a result of incompetent and management.

Taiwo and Agbatogun (2011) examined the relationship between government expenditure and economic growth using the method of co-integration and concluded that the total government expenditure impacts positively on growth. The flaw of the study was basically on the interpretation of results which impinges on the policy relevance of the paper. Robinson, Eravwoke and Ukavwe (2014) in their study of government expenditure and economic growth: the Nigeria experience, using co-integration and error correlation model, found that there is a long run relationship between government expenditure and economic growth. It is however disappointing that there was no form of discussion on the result from the analysis. Therefore the policy statements from the

work are not reliable. Momodu and Ogbolo (2014) examined public sector spending and macroeconomic variables in Nigeria rising Ordinary Least Squares method. The estimated results showed that government expenditure was more effective in stimulating growth in the period of deregulation than in the period of regulation. Ngerebara (2006) using simple regression analysis demonstrated that public expenditure is a not a major source of inflation in Nigeria. The value of R^2 was however too low for a serious conclusion. Based on the various findings above, the results have been mixed; while some concluded the relevance of public expenditure to economic growth others reported the contrary.

The methodology adopted in the studies reviewed centers around simple regression to co-integration and error correction models. In this study, we shall still use the method of co-integration too, but we shall select two variables from monetary policy indicators and two from fiscal policy indicators. The issue raised above constitutes our justification for this work.

The theories underpinning public expenditure can be grouped into two; macro-model theory and development model theory, Abu and Abdullahi (2010). Also, we have the Keynesian theory as well as the Samuelson theory. In economic literature, these theories explain the theoretical underpinning of the impact of public expenditure on economic growth, price level, employment and external debt. In Samuelson's pure theory of public expenditure, a proper way of allocating resources between the public and private sectors is emphasized. Samuelson's analysis assumed that there are two kinds of goods, private goods and public goods- consumed by two individuals. The analysis further posits that budget determination is based on individual preference function. He maintains that whereas there is rivalry in the consumption of private goods there is non-rivalry in the consumption of public goods. The consumption of public goods expresses non-rivalry and some level of efficiency, thus it is not possible to attain redistribution from a given optimum solution without someone else worse off. This is a situation of Pareto optimality. A major criticism against Samuelson's theory is that it is too abstract and a bit far from reality, Ajie, Akekere and Ewubare (2014).

Musgrave and Musgrave (1989), in their theory of public expenditure attempt to relate the demand for public services to the stage of economic development of a country. They based their explanations of increasing public expenditure on the need to provide social amenities for growth and development. They affirmed that some capital projects (social overheads)

are needed to accentuate the growth. This is hinged on the fact that expenditure is germane to propelling the economy to the take off stage and to cater for market failure issues. It is; however, note worthy to state that the first three stages of Rostow's five stages of growth are relevant to developing countries, Nigeria inclusive. Wagner's law of increasing state activity posits that as per capita income in an economy grows, the relative size of the public sector will grow. Wagner divides government expenditure into three categories; administration and defense, cultural and welfare functions and provision of direct services by government in case of market failure.

Government usually creates statutory corporations instead of allowing monopolies to emerge. Such corporations existed in Nigeria like the defunct PHCN, NITEL, etc. Wagner avers that as the economy becomes industrialized, urbanization and population led high density living will emerge. The consequence of this is market failure (externality and congestion which require government intervention (Nyong 2005; Taiwo 1990). The political theory of public expenditure as espoused in Peacock and Wiseman theory of public expenditure argued that the growth of public expenditure follow political economic path. The main thesis of the authors is that public expenditure does not increase in a smooth and continuous manner, but in jerks or step like fashion similar to displacement hypothesis. In times of crises, public expenditure increases and makes present revenue inadequate and this is quite clear to everyone. The present nagging problem of Boko Haram insurgency in North Eastern Nigeria necessitates

Methodology

This study employs time series data sourced from the Central Bank of Nigeria's Statistical Bulletin, Economic and Financial Review, and Statement of Accounts as well as the National Bureau of Statistics (NBS). The macroeconomic data cover Gross Public Expenditure, Money Supply, Exchange Rate, External Debt and External Reserves between 1970 and 2015 in Nigeria. The data gathered were then subjected to various econometric tests using E-view. The method of analysis for this study is the Error Correction

government to spend more on security, repairs and rehabilitation so as to cushion the effects of damage done to lives and properties in the affected area.

Oyinlola (2005) corroborates this view by arguing that the occurrence of unexpected social disturbance would necessitate an increase in government expenditure. The upward review of expenditure and taxes was referred to as displacement effect. The Keynesian thought posits that public expenditure can contribute positively to economic growth. This thought is hinged on the fact that government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effect on aggregate demand. By virtue of this process, government expenditure augments the aggregate demand, which engenders increased output depending on expenditure multipliers. In Keynesian view point, economic downturns could be reversed by government's act of borrowing from the private sector and then returning the money to the private sector through various spending programs, Chude and Chude (2013). This is because high level of government spending can increase employment, profitability and investment through the mechanism of multiplier effects on aggregate demand. Drawing from the above exposition on the theories of public expenditure, the theoretical underpinning of this work is premised on the macro-model theories of Wagner's law, Peacock and Wisemen thought as well as the development theories of Keynesian thought and Musgrave Rostow's thought.

Mechanism (ECM) and the estimation technique is the ordinary least square method.

Model Specification

Based on the theoretical exposition and following extant literature in the works of Odedokun (2001), Taiwo and Agbatogwu (2011), and Nijkanp (2004) work on the meta-analysis of the effect of fiscal policy on long run economic growth. The following model is adopted but with slight modification from the above by incorporating both monetary and fiscal policy indicators.

$$PEX = f(MSS, EXR, EXD, ERS) \dots\dots\dots(1)$$

Where:

- PEX = Total public expenditure
- MSS = Money supply
- EXR = Exchange rate
- EXD = External debt
- ERS = External reserve.

Put in an explicit form,

$$PEX = \beta_0 + \beta_1 MS + \beta_2 EXR + \beta_3 EXD + \beta_4 ERS + U_t \text{-----}(2)$$

$\beta_1 > 0, \beta_2 < 0, \beta_3 < 0, \beta_4 > 0.$

Estimation Procedure and Discussion of Results

To avoid running a spurious regression, this paper conducts check of the stationarity property of each variable by employing the Augmented Dickey Fuller (ADF) unit root test. Next, Johansen co-integration

test is used to analyze the presence of the long-run equilibrium relationship between the variables. If a long run relationship is established then a dynamic short run adjustment can be estimated. The tables below show our various results.

Table 1: ADF Unit Roots Test Result

Variables	Level data	First Difference	Order of Integration
MS	1.07	-3.64	I(1)
EXR	-2.23	-4.96	I(1)
EXD	-2.10	-3.48	I(1)
EXRES	-0.15	-6.38	I(1)
PEX	-1.17	-7.79	I(1)

Source: Author’s computation, (2017)

The result shows that the variables were originally non-stationary at levels, but stationarity is restored after first difference ie they are integrated of order

1(1). This therefore allows us to estimate the long run relationship. The result of the Johnson cointegration test is shown below:

Table 2: Johansen’ Co-integration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None	0.471010	70.37519	69.81889	0.5328
At Most 1	0.343436	31.36125	47.85613	0.6470
At Most 2	0.277414	17.47699	29.79707	0.6048
At Most 3	0.152442	6.754657	15.49471	0.6063
At Most 4	0.038529	1.296588	3.841466	0.2548

Source: Author’s computation, (2017)

The table above shows the Johansen’s co-integration test result. The co-integration test is based on the trace and maximum Eigen value. There is at least one co-integration vector. The null hypotheses of no co-integration are rejected. This means that both the trace and Eigen value statistics indicate that the variables

are co-integrated and there is a long run relationship between dependent variable and the independent variables.

The result of the ECM which was deduced from the over parameterized ECM is shown in the table below:

Table 3: ECM Result: Dependent Variable: LPEX

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LXRES	0.226669	0.063112	3.591559	0.0013
LXRES (-2)	0.121032	0.056433	2.144717	0.0411
LEXD	0.096704	0.045131	2.142736	0.0413
LEXR(-1)	0.100791	0.093014	1.083607	0.2881
LMS	0.286370	0.102419	2.796068	0.0094
ECM(-1)	-0.600083	0.165355	-3.629063	0.0012
C	3.176282	0.826424	3.843407	0.0007

Source: Author’s computation, 2017

$R^2 = 0.78, AIC = -0.42, SE = -0.11$

The result shows that external reserves at both current and lag levels have a significant and positive impact on the level of public expenditure in Nigeria. An increase in current and 2 period lagged external reserves by 1 percent each will increase the level of public expenditure by 0.23% and 0.12% respectively. External debt has a significant and positive impact on public expenditure. An increase in external debt by 1

percent increased public expenditure by .09%. A depreciation of the exchange rate by 1 percent increased public expenditure by 0.10 percent. Money supply has significant impact on public expenditure. An increase in money supply by 1 percent increased public expenditure by 0.29. The ECM is significant and conforms to expected sign indicating a satisfactory speed of adjustment. The D-Watson

statistics shows that there is no presence of autocorrelation. The diagnostic check results include those of the Breusch-Godfrey, Jarque-Bera tests. With a probability of 0.40 and 0.50, the result indicates that the residuals are not serially correlated and that the residuals are normally distributed. The result of the impulse response test is shown in the figure below:

CUSUM stability test

Model also pass through diagnostic test and against series correction, or estimated the co-efficient of the error correction mechanism, is also conducted graphically.

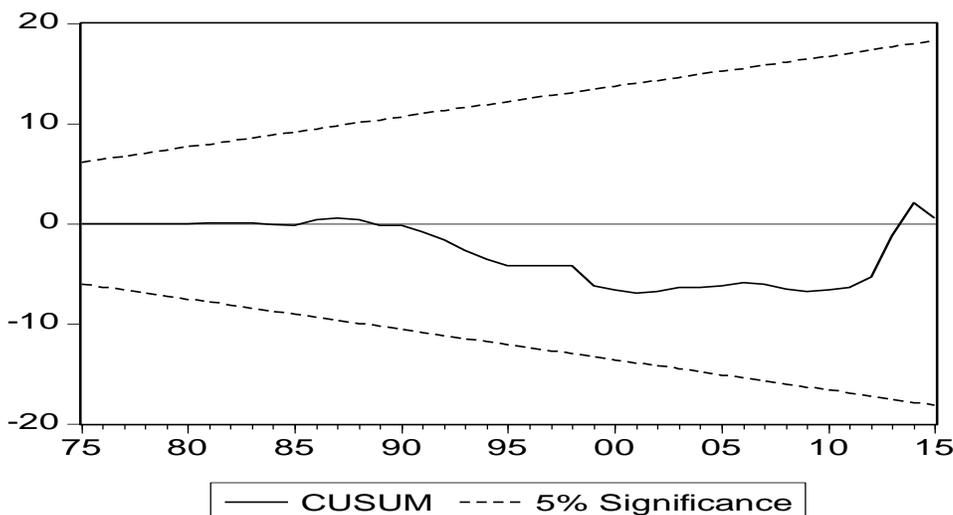


Figure 1: Plot of Cumulative Sum of the Recursive Residuals

The straight-lines significance represents the 5% significance relationship with the variables, it can be traceable with five years interval and observation, and

the stability test is between 1975 to 2015 and the curve lines show that the fluctuation of the variables over the years.

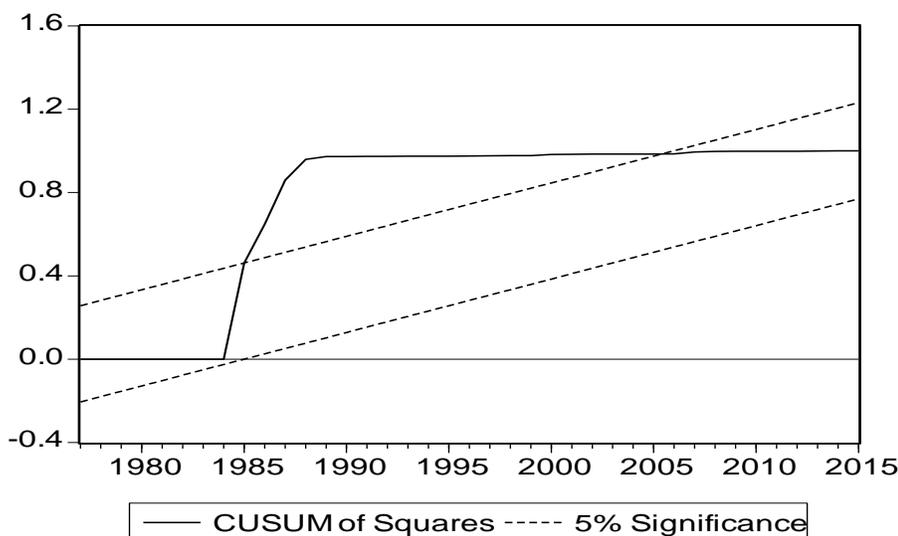


Figure 2: Plot of Cumulative Sum of Squares of the Recursive Residuals

The straight-lines significance represents the 5% significance relationship with the variables, it can be

traceable with five years interval and observation of the stability test is between 1980 to 2015 and the

curve lines show the fluctuation of the variables over the years.

The graphical estimations of the stability test of the cumulative sum (CSUM) and the cumulative sum of squares (CUSUM) of the recursive residuals are established at the 5 percent significant level, which is plot at figure 1 and 2 for the estimations of the error correction mechanism of stability test over the period.

Both the Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Squares of Recursive Residuals (CUSUMQ) test indicate that the residuals are stable.

Conclusions and Recommendations

The main thrust of this paper is to investigate the impact of some selected macroeconomic variables on public expenditure. The study employed the Error Correction Mechanism as a model and used Ordinary Least Square as the estimating technique. The study found that: The explanatory variables successfully explained over 78% of the systematic variations in public expenditure. Also, external reserves have significant and positive effect on public expenditure.

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External debt has significant and positive effect on public expenditure. Money supply has positive and significant impact on public expenditure. 1 period lagged exchange rate has positive but insignificant impact on public expenditure.

Against the background of the above findings, it is recommended that: Diversification of economy should be a deliberate strategy in order to enhance non-oil revenue so as to share up external reserves continually, export promotion policies should be formulated and vigorously pursued. There is a need to consolidate on the gains of debt relief and ensure that huge accumulation of external debt does not arise again. The Debt Management Office should remain highly professional and independent of executive influence in the management of the government's debt profile. The monetary authorities should pursue monetary policies that ensure the management of money supply in such a way that the macro economy is stabilized. The present incidence of market failure in the foreign exchange market should not be left to the invisible hand to sort out. Government's intervention is required from time to time bearing in mind that Nigeria is a developing economy.

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