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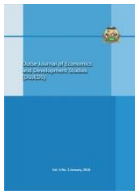

IMPACT OF GOVERNMENT EXPENDITURE ON MANUFACTURING SECTOR IN NIGERIA (1986-2016)

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Abstract

The study examined the impact of government expenditure on manufacturing sector output in Nigeria from 1986 to 2016, a period of 30 years using the Dynamic Ordinary Least Squares (DOLS) multiple regression analysis. The unit root test using Augmented Dickey Fuller revealed that all the series were stationary at first difference. The findings obtained from the long run Dynamic OLS showed that government capital expenditure (GCEXP) was positive and significant and therefore impacted significantly on manufacturing output (MO) in Nigeria. The government recurrent expenditures (GEEXP) was positive but not significant on manufacturing output during the period under study. The empirical findings further indicated that the ECM was negative and statistically significant at 5%. The speed of adjustment was 24.9. The Pairwise Granger Causality Tests result shows that there is unidirectional causality among the variables. GCEXP cause change in MO, but MO does not cause change in GCEXP. GREXP cause change in MO, but MO does not cause change in GREXP. The study recommended that there is need for government to reduce its budgetary allocation to recurrent expenditure and place more emphasis on the capital expenditures such as power, roads since capital expenditure has the greatest impact on the long-run with manufacturing sector output in Nigeria. Government should increase its funding of anti-graft or anti-corruption agencies like the Economic and Financial Crime Commission (EFCC), and the Independent Corrupt Practices Commission (ICPC) in order to arrest and penalize those who divert and embezzle public funds.

Keywords: Expenditure, Capital, Recurrent, Manufacturing Sector, Output, DOLS

Introduction

The direction and magnitude of relationship between government expenditure and economic growth has continued to generate series of debate among scholars. It is obviously presumed that Government performs two basic functions-protection (and security) and provisions of certain public goods. The Protective function entails creation of rule of law and enforcement of property rights which helps to minimize risks of criminality, protect life and property, and the nation from external attacks; while defense, roads, education, health, and power, etc. are goods provided by government. Many scholars have supported the fact that increases in government expenditure on socio-economic and physical infrastructures encourage economic growth.

Over the past decades, the public sector spending has been increasing in geometric terms through government various activities and interactions with its Ministries, Departments and Agencies (MDA‟s).

Although, the general view is that Government expenditure either recurrent or capital expenditure, notably in social and economic infrastructure can be growth-enhancing, the financing of such expenditure to provide essential infrastructural facilities government, including transport, telecommunications, water, electricity and sanitation, waste disposal, education and health-can be growth-retarding (for example, the negative effect associated with taxation and excessive debt). In government capital expenditure was ₦10,163.30 million in 1980, it increases to ₦24,048.60 million in 1990, ₦239,450 million in 2000, ₦1,694,825.80 billion 2010, and to ₦2.43 trillion in 2018. Likewise the recurrent expenditure has witnessed the same upward trend from ₦4,805.20 million in 1980, 36,219.60 million in 1990, ₦461,608.50 million in 2000, ₦1, 694,825.80 billion in 2010 and to 6.18 trillion in 2018 (Okoro, 2013: FGN,2018) The size and structure of government expenditure will determine the pattern and form of growth in output of the economy (Taiwo, and Abayomi, 2011).

The structure of Nigerian government expenditure can broadly be categorized into capital and recurrent expenditure. The recurrent expenditure is government expenses of administration, such as wages, salaries, interest on loans, maintenance, etc., whereas expenses on capital projects like roads, airports, education, telecommunication, electricity generation etc., are referred to as capital expenditure. One of the main purposes of government spending is to provide infrastructural facilities (Taiwo and Abayomi, 2011). Nurudeen and Usman (2010), added that, in Nigeria, government expenditure has continued to rise due to the huge receipts from production and sales of crude oil, and the increased demand for public (utilities) goods like roads, communication, power, education and health. Besides, there is increasing need to provide both internal and external security for the people and the nation (Jelilov, 2015). Available statistics, according to Nurudeen and Usman (2010) show that total government expenditure (capital and recurrent) and its components have continued to rise in the last three decades. For instance, government total recurrent expenditure increased from N3,819.20 million in 1977 to N4,805.20 million in 1980 and further to N36,219.60 million in 1990. Recurrent expenditure was N461, 600.00 million and N1,89,270.00 million in 2000 and 2007, respectively. In the same manner, composition of government recurrent expenditure shows that expenditure on defense, internal security, education, health, agriculture, construction, and transport and communication increased during the period under review (Jelilov, Gylych; Waziri, Fadimatu; Isik, and Abdurrahman, 2016). Moreover, government capital expenditure rose from N5,004.60 million in 1977 to N10,163.40 million in 1980 and further to N24,048.60 million in 1990. The value of capital expenditure stood at N239, 450.90 million and N759, 323.00 million in 2000 and 2007, respectively. Furthermore, the various components of capital expenditure (that is, defense, agriculture, transport and communication, education and health) also show a rising trend between 1986 and 2016. Some scholars have argued that an increase in government spending can be an effective tool to stimulate aggregate demand for a stagnant economy and to bring about crowed-in effects on the private sector.

According to Keynesian view, the government could reverse economic downturns by borrowing money from the private sector and then returning the money to the private sector through various spending programs (Jelilov, Gylych; Kalyoncu, Huseyin; Isik & Abdurahman, 2015). High levels of government consumption are likely to increase employment, profitability and investment via multiplier effects on aggregate demand. Thus, government expenditure, even of a recurrent nature, can contribute positively to economic growth. On the other hand, endogenous growth models such as Barro (1990), predict that only those productive government expenditures will positively affect the long run growth rate.

The manufacturing firm plays an important role in a modern economy and has a lot of benefits that are important for economic growth. In developed countries the manufacturing sector is a leading sector in many angles. In its quest to increasing productivity in relation to import substitution and export expansion, creating foreign exchange earnings capacity to promote the growth of investments on a faster rate than any other sector in the economy, raising employment opportunity, as well as wider and more efficient linkage among different sectors (Fakiyesi, 2005).

The Central Bank of Nigeria (CBN) in its annual reports (2016) highlighted that during the 1960s and early 1970s, manufacturing activities were positively accelerated and value added per worker was at par with, if not higher than that in other African countries such as Botswana, Ghana and Kenya. During this period the share of manufacturing in GDP nearly doubled from less than 5 percent to 8 percent and on that trend many people believed that the country was on a path to industrialization. It was observed, however, that as from the 1980s manufacturing firms in Nigeria experienced relative stagnation as the sectors value added per capital lagged behind that of many comparator countries. Prior to the oil boom of the 1970's, manufacturing contributed approximately 10% to Nigeria's economic output. Since a peak of 7.83% in 1982, the contribution of manufacturing as a share of total economic output in Nigeria generally

declined. Throughout the 1990s and 2000's, Nigeria continued to rely heavily on the export of oil, allowing manufacture to remain in decline. Firms were not export orientated, and lacked efficiency, causing competitive companies to relocate factories abroad. A few key industries, such as beverages, textiles, cement and tobacco kept the sector afloat, but even these operated at under half of their capacity. To this day, production is mainly located in Lagos and its periphery, and to a lesser extent some other commercial towns such as Kano or Kaduna. In 2010, the sector contributed N3,578,641.72 million, the Manufacturing sector represented 6.55% of total real GDP in that year. It grew by N948,803.34 million or 26.51% in 2011 to reach N4,527,445.06 million or 7.79% of real GDP in that year and by N1,061,376.64 million or 23.44% in 2012 to reach a value of N5,588,821.69 million or 7.79% of real GDP that year. However, growth was highest in 2013, at N1,644,500.79 million or 29.42%, so that the contribution of the Manufacturing sector reached N7,233,322.48 million or 9.03% of real GDP, a value that had not been recorded in decades. Presently, the manufacturing sector is experiencing collapse with an average capacity utilization hovering around 40 percent. The Manufacturers Association of Nigeria (MAN) in a survey carried out as part of its membership operational audit in January 2010, recorded that of the 2780 registered members, a total of 839 (30.2%) manufacturing firms closed their factories in 2009. This is due to their inability to cope with the challenges posted by the harsh operating environment in Nigeria; which include the exchange rate management problems and infrastructural decay. In the annual report of MAN for 2006, it was also claimed that the job loss in the sector between 1983 and January 2006 was estimated at 4.2 million. In addition, in the Newsletter edition of the Association for March, 2010, it was reported that one million jobs have been lost in the sector between 2006 and 2010. Recently, the scarcity of foreign exchange as well as the harsh operating environment took its toll on the operations of the manufacturing sector in the 2016 fiscal period with the sector recording a decline of N80bn in its contribution to Gross Domestic Product (NBS,2014).

In general, the growth rates of government expenditure and manufacturing output have declined over the period 1970-2016, between 1970 and 1975, government expenditure had increase on average by 91 percent while manufacturing output had an average increase of 37 percent. Over the next 5-year period, that is, 1976-1980, government expenditure grew by 35% on average while that of manufacturing output was 36 percent, indicating a decline in their growth rates, although the growth patterns are positive. Over the subsequent 5-year period (i.e., by 1980-85), government expenditure experienced an average fall of 9 percent and this was accompanied by a low positive growth rate of about 6 percent in manufacturing output. One would recall that in the early 80s, developing countries experienced a downturn in credit flows and the period also marked a general decline in economic performance in the developing world, which may have translated to the sharp decline in the Nigerian government's expenditure on capital projects. This appears to have contributed to the significant fall in the growth of manufacturing output, although it remained positive on average. The trends however, improved over the next interval as expenditure surged upward by 40 percent on average by 1990 while the corresponding growth rate in manufacturing output was 19 percent. The average growth rates of the two economic variables have remained positive over the remaining periods of the sample. However, these rates have declined over time with government capital expenditure increasing by about 12 percent over the period 2011 and 2013 while manufacturing output only increased correspondingly by about 7 percent. The above trends ultimately suggest relationship between government expenditure and manufacturing output (NBS,2014). Consequently, this is study examine; the impact of government expenditure on manufacturing output in Nigeria; the causal link between government capital expenditure and industrial output in Nigeria and the causal link between government recurrent expenditure and industrial output in Nigeria

Theoretical Review of Literature

Some basic theories have been developed by economists in order to support the effects of government expenditure on economic growth, such theories amongst others are; the Wagner's law of increasing state activity, Peacock-Wiseman Hypothesis, Musgrave theory of public expenditure and Keynesian theory

Wagner's Law of Increasing State Activity

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

i. The extension of the functions of the states lead 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 to increase in the national income and will thus result in a relative expansion of the public sector.

The Peacock-Wiseman Hypothesis

Peacock and Wiseman conducted a new study based on Wagner's Law. They studied the public expenditure from 1891 to 1955 in U.K. They found out that Wagner's Law is still valid.

Peacock and Wiseman further stated that :-

1. "The rise in public expenditure greatly depends on revenue collection. Over the years, economic development results in substantial revenue to the governments, this enabled to increase public expenditure".
2. There exists a big gap between the expectations of the people about public expenditure and the tolerance level of taxation. Therefore, governments cannot ignore the demands made by people regarding various services, especially, when the revenue collection is increasing at constant rate of taxation.
3. They further stated that during the times of war, the government further increases the tax rates, and enlarges the tax structure to generate more funds to meet the increase in defense expenditure. After the war, the new tax rates and tax structures may remain the same, as people get used to them. Therefore, the increase in revenue results in rise in government expenditure.

Baumol's Unbalanced Productivity Growth

Government expenditure may increase as a result of increasing input costs in the public sector relative to those in the private sector. Baumol's model divides the economy into two broad sectors:

i. "Progressive Sector": Characterized by technologically progressive activities (e.g. innovation; capital formation; scale economies) which result in output level increases. there are cumulative employee productivity increases, which justify subsequent wage/salary increases;

ii. "Non-progressive Sector":characterised by sporadic changes in productivity. Labour is often the end product (e.g. lecturers!!). The sector is primarily service-oriented, with the public sector being a large component (education, health etc.) Technological advances do not have as great an effect upon productivity in this sector as in the progressive sector.

Despite such differences, Baumol argues that there cannot be too big a wage/salary differential between the two sectors, or all employees would want to join the progressive sector. This raises costs in the non-progressive sector, resulting in increased government expenditure. Also, if production in the non-progressive sector has to be maintained relative to the progressive sector, this will require a greater number of employees in the former, with potentially negative consequences for economic growth. Baumol's model has been criticised for underestimating the opportunities for technological advancement in the public sector. However, reference to the share of government expenditure taken up by employee remuneration

Musgrave Theory of Public Expenditure

This theory was propounded by Musgrave (1964) as he found changes in the income elasticity of demand for public services in three ranges of per capita income. He posits that at low levels of per capita income, demand for public services tends to be very low. This is so because according to him such income is devoted to satisfying primary needs and that when per capita income starts to rise above these levels of low income, the demand for services supplied by the public sector such as health, education and transport starts to rise, thereby forcing government to increase expenditure on them. He observes that at the high levels of per capita income, typical of developed economics, the rate of public sector growth tends to fall as the more basic wants are being satisfied.

The Keynesian Theory

Of all economists who discussed the relation between public expenditures and economic growth through industrial sector output, Keynes was among the most noted with his apparently contrasting viewpoint on this relation. Keynes regards public expenditures as an exogenous factor which can be utilized as a policy instruments promote economic growth. From the Keynesian thought, public expenditure can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augments the aggregate demand, which provokes an increased output depending on expenditure multipliers. Keynesian economics was very influential for several decades and dominated public policy from the 1930s to the 1970s. The theory has since fallen out of favour. But it still influences policy discussion particularly on whether or not changes in government spending have transitory economic effects. For instance, some policymakers still use Keynesian analysis to argue that higher or lower level of government spending will stimulate or dampen economic growth.

Empirical Review

There have been numerous studies on the effect of government expenditure in the long-term economic growth. But, there is no consistent evidence for a significant relationship between government spending and economic growth through manufacturing sector output, both in positive or negative direction. Results and evidence about the effect of government expenditure differ by country, analytical methods employed and categorization of government expenditures. Samson (2013) used vector error correction model and granger causality model to investigate the relationship between government expenditure and economic growth through industrial sector in Nigeria. The study observed that there is significant negative relationship between government spending and industrial sector of the economy. The findings suggest that there should be effective channeling of public funds to productive sectors in Nigeria.

Employing three-stage-least square (3SLS) technique and macro-econometric model of simultaneous equations, Onakoya and Somoye (2013) examine the impact of public capital expenditure on economic growth in Nigeria. The study revealed that public capital expenditure contributes positively to economic growth in Nigeria as it promotes the output of oil and infrastructural sectors but it is directly deleterious to the output of manufacturing and agricultural sector. Employing co-integration, error correction model and ordinary least square method, Eze and Ogiji (2013) investigate the impact of fiscal policy on the manufacturing sector output in Nigeria. The result revealed that government expenditure significantly affect manufacturing sector output based on the level of its co-efficient and p-value and there is long-run relationship between fiscal policy and manufacturing sector output in Nigeria. Melissa and Dean (2013) examine the effect of public expenditure productivity on manufacturing sector in UUSA cities using simple Cobb-Douglas production function model. It was discovered that there is strong positive and statistically significant relationship between private capital and labour productivity.

Using ordinary least square (OLS) method, Loto (2012 investigates the determinants of output expansion in the Nigerian manufacturing industries between 1980 to 2010. It was found that inflation rate play the highest significant role in explaining manufacturing sector output expansion in Nigeria.

Using multivariate model of simultaneous equations and three-stages of least squares method (LSM), Onakoye, Tella and Osoba (2012) examine the relationship between investment in telecommunication infrastructure and economic growth in Nigeria. The study found that telecommunication infrastructural investment has a significant impact on output of the economy directly through its industrial output and indirectly through the output of other sectors such as agriculture, manufacturing, oil and other services. In line with the above gap as identify in the literature, the study employed all the tools needed to investigate the impact of government capital expenditure on manufacturing sector output in Nigeria and as well identify all factor that affect manufacturing sector in Nigeria.

In Nigeria, there is controversy as to the role government expenditure on economic growth for instance; Ifarajimi and Ola (2017) investigated the impact of government expenditure on economic growth from 1981 to 2015 using Dynamic Ordinary Least Squares that incorporates endogeneity in its estimation. The unit root test using Augmented Dickey Fuller revealed that all the series were stationary at first difference. The two-step Engle-Granger residual test showed that the residual was stationary at level; thus, there was a long run relationship among the series. The findings obtained from the long run Dynamic OLS showed that government expenditure on administration, government expenditure on economic services and nominal exchange rate were significant and had the expected signs except government expenditure on economic services. The empirical findings further indicated that the ECM was negative and statistically significant at 5%. The speed of adjustment was 71.38%. Lastly, in the short-run analysis, findings revealed that the nominal exchange rate was significant and had the expected sign. This might have been due to the influence of naira depreciation on government expenditure.

Udoffia and Godson (2016) investigated the impact of federal government expenditure on the Nigerian economic growth. The study adopted the Ordinary Least Square estimation technique to estimate the model specified using time series data for the period 1981-2014. Real Gross Domestic Product was used as the dependent variable while federal government capital and recurrent expenditures were used as the independent variables. The data used in the analysis were gotten from Central Bank of Nigeria (CBN) statistical bulletin. The result from the regression analysis shows that federal government capital and recurrent expenditures have a positive effect on real GDP. Nurudeen and Usman (2010) analysed the impact of government expenditure on economic growth in Nigeria and found that government total capital expenditure has negative effect on economic growth.

Also, comparing the relative effectiveness of fiscal versus monetary policies on economic growth in Nigeria, Adefeso and Mobolaji (2010) suggest that

the effect of monetary policy is more prominent than fiscal policy on economic growth in Nigeria. Moreover, Ighodaro and Okiakhi (2010) disaggregated government expenditure into general administration, and community and social services in examining the effect of government expenditure on economic growth in Nigeria using time series data and found that both components of government expenditure have negative impact on economic growth.

However, Ekpo (1995), found that capital expenditure on transport, communication, agriculture, health and education positively influence private investment in Nigeria, which invariably enhanced the growth of the overall economy. In the same vein Ogbole, Sonny and Isaac (2011) focused on the comparative analysis of the impact of fiscal policy on economic activities in Nigeria during regulation and deregulation, using the econometric methods of cointegration and error correction model. The study indicates that there is a difference in the effectiveness of fiscal policy in stimulating economic growth during and after regulation period. They recommend that government fiscal policy should refocus and redirect government expenditure towards production of goods and services so as to enhance GDP growth.

On the issue of manufacturing sector development in Nigeria, Ajayi (2011) in a study of the collapse of Nigeria's manufacturing sector in Nigeria used cross-sectional research design and found out that the main cause of collapse in the Nigerian manufacturing sector is low implementation of Nigerian budget especially in the area of infrastructure. This means that low implementation of fiscal policy affects the level of growth in Nigerian manufacturing sector. In the same vein, Rasheed (2010) investigated the productivity in the Nigerian manufacturing subsector using cointegration technique and an error correction model. The study indicates the presence of a long-run equilibrium relationship index for manufacturing production, determinants of productivity, economic growth, interest rate spread, bank credit to the manufacturing subsector, inflation rates, foreign direct investment, exchange rate and employment rate. Sangosanya (2011) used panel regression analysis model and Gibrat's law of proportionate effect in investigating firm growth dynamics in Nigerian manufacturing industry. The study observed that the manufacturing firm's finance mix, utilization of assets to generate more sales, abundance of funds reserve and government policies are significant determinants of manufacturing industry growth in Nigeria. Sikiru and Umaru (2011) studied the causal link between fiscal policy and economic growth in Nigeria, using Engle-Granger approach and error correction models which was estimated to take care of short-run dynamic. The result indicates that productive expenditure positively impacted on economic growth during the period covered. Charles (2012) investigated the performance of monetary policy on manufacturing sector in Nigeria, the result indicates that money supply positively affects manufacturing index performance while company lending rate, income tax rate, inflation rate and exchange rate negatively affect the performance of manufacturing sector. This means that monetary policy is vital for the growth of the manufacturing sector in Nigeria, which in turn would lead to economic growth

Methodology

An ex-post facto design (quantitative research design) was used to carry out this study. The data used in this study come from secondary sources. The data generated are quantitative time series data on Manufacturing Sector Output(MO), Total government Capital Expenditure (GCEXP)and total government recurrent Expenditure(GREXP) from the CBN and NBs statistical bulletins for the period between 1986 to 2016. This period chosen for the study encompasses the phases when government capital and recurrent expenditure inconsistency. To empirically analyze the above functional form, the Dynamic Ordinary Least Squares (DOLS) model specification was used to show the long run relationships and dynamic interactions between government expenditure fluctuations and manufacturing output.

The model for this study is derived from works of Adewara and Oloni (2012) which was adapted from the works of Kocherlakota and Yi (1997). The model of Adewara and Oloni (2012) is specified as follows:

$$MO = f(GCEXP, GREXP, EXR, CPI) \quad \ldots\ldots 1$$

Where,
MO = Manufacturing Output
EXR = Exchange Rate
CPI= Consumer Price Index
GCEXP= Government Capital Expenditure
GREXP= Government Capital Expenditure
μ_t = Error Term

$$MO_t = \alpha_0 + \alpha_1 GCEXP_t + \alpha_2 GREXP_t + \alpha_3 EXR_t + \alpha_4 CPI_t + \mu_t \quad \ldots\ldots 2$$

Taking the logarithm of equation (2), we have:

$$ln\,M\,O_t = \alpha_0 + \alpha_1\,lnGCEXP_t + \alpha_2\,lnGREXP_t + \alpha_3\,lnEXR_t + \alpha_4\,lnCPI_t + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots 3$$

Transforming equation (3) into Dynamic Ordinary Least Squares (DOLS) model, the equation becomes:

$$ln\,M\,O_t = X_tM + \sum_{i=m}^{i=m} \alpha_1\,\Delta\,lnGCEXP_t + \sum_{i=n}^{i=n} \alpha_2\,\Delta\,lnGREXP_t + \sum_{i=p}^{i=p} \alpha_3\,\Delta\,lnEXR_t + \sum_{i=q}^{i=q} \alpha_4\,\Delta\,lnCPI_t + \mu_t \ldots\ldots\ldots\ldots 4$$

In equation 4, Xt is a vector of all explanatory variables (GCEXP,GREXP,EXR and CPI); M/ is a subset of I(1) variables of X; α1, α2, α3 and α4, are vectors of long- run coefficients; μt is a well behaved error term; m, n, p, and q are leads of the first difference of explanatory variables; Δ is the first difference operator, and –m, -n, -p, and -q are lags of the first difference of explanatory variables. The leads and lags of the first difference of explanatory variables are included to deal with the problems of endogeneity and autocorrelation as adopted by Craigwell and Wright (2012).

To estimate the short run dynamics equation (4) becomes:

$$\Delta MO_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1\,\Delta\,GCEXP_t + \sum_{i=1}^{p} \alpha_2\,\Delta\,GREXP_t + \sum_{i=1}^{p} \alpha_3\,\Delta\,EXR_t + \sum_{i=1}^{p} \alpha_4\,\Delta\,CPI_t + \gamma ECM_{t-1} + \mu_t \ldots\ldots 5$$

The ECM enables us to distinguish between the short-run and the long-run and its results indicate the speed of adjustment back to long run equilibrium after a short run shock. The use of Dynamic Ordinary Least Square (DOLS) requires that the dependent variable should be I(1) and at least some of the right hand side (RHS) variables should be I(0) or I(1). This condition requires that estimation should commence by conducting stationarity test. The lag length of the first difference of each series will be obtained as the stationarity test is conducted. In this study, we employ Augmented Dickey Fuller (ADF) test. This test operates under the hypothesis of series has unit root. Schwarz Information Criterion and Akaike Information Criterion are used to decide optimal lag length. The ADF test has the following model:

$$\Delta X_t = \lambda_0 + \lambda_1 X_{t-1} + \lambda_2 T + \sum_{i=1}^{n} \varphi i \Delta X_{t-1} += \varepsilon_{t,}\varepsilon_t \Pi(0, Q^2) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

In equation (6), is the difference operator, X is the natural logarithm of the series, T is a trend variable, λ and are the parameters to be estimated and is the error term, which is independently and identically distributed with zero mean and constant variance. Therefore, it adjusts the error terms by adding the lagged difference terms of the regressand (Engle & Granger, 1987). The stationarity test provides a ground to determine the order of integration of the variables employed in the model. One point to note is that if the variables are integrated of different orders, then there is need to look for co-integration. Co-integration tests help to establish if some long-run equilibrium relationship exists between the dependent variable and all the variables entering the Manufacturing output MO function. We employ Johansen's approach to measure this long-run equilibrium relationship among the variables. This is done by checking if the residual obtained from static OLS is stationary at level or not. If the residual is stationary at level, the series are co-integrated. Then, equation 4 would be estimated using the dynamic OLS, followed by short run dynamics specified in equation 5.

Data Analysis and Discussion

Unit Root Test

A unit root was carried out to determine if the variables are stationary or not. Augmented Dickey Fuller was employed in conducting the unit root test. The variables are linearized in order to reduce their values. This was done basically to ensure that the variables were not I(2) stationary or of a higher order than I(1).in the presence of I(2) variables the computed F-statistics are not valid because the bounds test is to avoid spurious results, the time series have to be tested to determine their data generation process

Table 1: Summary of Unit Root Test Results

Variable	Order of Integration	ADF Test Statistics	Critical ADF Test Statistics	P-value
MO	I(1)	-6.021775	-3.587527	0.0002
GCEXP	I(1)	4.177125	-3.004861	0.0000
GREXP	I(1)	-7.105921	-2.967767	0.00000
CPI	I(1)	-3.192314	-2.967767	0.0308
EXR	I(1)	-5.870870	-3.574244	0.0002

Source: Authors Computation, 2019 (Eview-10)

From table 1, all the five variables; MO, GCEXP, GREXP, CPI and EXR were found stationary at first difference, and they are integrated of order one, that is *I*(1). At this order of integration, its ADF test statistics are greater than their critical test statistics at 5% and 1% level of significance respectively. These stationary variables were then used for the linear multiple regression analysis.

Co-Integration Test

It had been identified that the series of the variables are integrated of order zero and one. So we proceeded to the formal testing of long run co-integration by performing the Johansen's approach to measure this long-run equilibrium relationship among the variables.

Table 2: Johansen's Co-integration Tests Results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.789228	90.58344	69.81889	0.0005
At most 1	0.561233	45.43102	47.85613	0.0830
At most 2	0.352568	21.54119	29.79707	0.3247
At most 3	0.248815	8.933687	15.49471	0.3715
At most 4	0.021716	0.636694	3.841466	0.4249

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.789228	45.15242	33.87687	0.0015
At most 1	0.561233	23.88983	27.58434	0.1386
At most 2	0.352568	12.60751	21.13162	0.4890
At most 3	0.248815	8.296993	14.26460	0.3493
At most 4	0.021716	0.636694	3.841466	0.4249

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Authors Computation using Eview-10 (2019)

From table 2 above, the result indicated a long run relationship between the variables. The estimated long run coefficients show that there is a long run relationship between government expenditure and manufacturing output.

Table 3: Estimated Long run coefficients using the Dynamic Ordinary Least Square (DOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GCEXP	0.061897	0.013717	4.512559	0.0009
GREXP	0.157727	0.088861	1.774979	0.1035
EXR	0.719223	0.361634	1.988818	0.0722
CPI	-0.038600	0.013180	-2.928661	0.0137
C	163.0128	6.085518	26.78701	0.0000
R-squared	0.990987	Mean dependent var		186.9536
Adjusted R-squared	0.977878	S.D. dependent var		85.14883
S.E. of regression	12.66456	Sum squared resid		1764.303
Long-run variance	144.5192			

Source: Authors Computation using Eview-10 (2019)

The results presented in Table 3 shows that the R-squared (R^2), attributed to the independent variables is 0.990987. This implies that all the independent variables explained about 99.1 percent of the variations in MO and the remaining 0.9% can be attributed to other factors not included in the model. Dynamic OLS does not report F- statistics and DW Statistics (E-views 10).

Government capital expenditure on administration (GCEXP) has a positive sign and is significant at 5%. The result showed that every 1% increase in government capital expenditure on administration leads to 0.06% increase in manufacturing output MO during the years under study. This finding is in line with the findings by Onakoya and Somoye (2013). Their study revealed that public capital expenditure contributes positively to economic growth in Nigeria as it promotes the output of oil and infrastructural sectors.

However, this government recurrent expenditure is positive but insignificant. The result showed that every 1% increase in government recurrent expenditure on administration leads to 0.16% increase in manufacturing output MO during the years under study. This finding is similar to the findings of Eze and Ogiji (2013) and Tawose (2014). His findings showed that government expenditure on economic services has inverse relationship with industrial productivity in Nigeria. Expenditure on government economic services should have promoted economic growth in the country but high level of corrupt practices prevalent in Nigeria (diversion of public funds into private accounts, misappropriation of public fund and inflating contract price) have become impediments to economic growth.

Table 4: VAR Lag length selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1048.092	NA	2.39e+25	72.62705	72.86279	72.70088
1	-880.4485	265.9175*	1.32e+21*	62.78955*	64.20400*	63.23254*
2	-855.5615	30.89421	1.57e+21	62.79735	65.39049	63.60949

Source: Authors Computation using Eview-10 (2019)

The lag length selection is based on any criterion with lowest value. In table 4 above , using the Schwarz Information Criterion and Akaike Information Criterion lag 1 is selected as the best lag. Therefore, based on lag length selection criteria which state that the lower the value of any criteria, the better the model.

Table 5: Estimated Coefficients of the short run Dynamic Error correction Model

Included observations: 27

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MO(-1))	0.519630	0.128602	4.040612	0.0049
D(MO(-2))	0.303519	0.165863	1.829939	0.1100
D(MO(-3))	-0.163607	0.109575	-1.493108	0.1790
D(CPI)	-0.009233	0.005442	-1.696711	0.1336
D(CPI(-1))	-0.005099	0.006926	-0.736138	0.4856
D(CPI(-2))	0.014524	0.006586	2.205413	0.0632
D(GCEXP)	-0.001020	0.000486	-2.096330	0.0743
D(GCEXP(-1))	-0.114387	0.017022	-6.719896	0.0003
D(GCEXP(-2))	-0.108255	0.016339	-6.625596	0.0003
D(GCEXP(-3))	-0.052507	0.016450	-3.191914	0.0152
D(GREXP)	0.032095	0.015861	2.023458	0.0827
D(GREXP(-1))	-0.036488	0.015519	-2.351169	0.0510
D(GREXP(-2))	-0.071449	0.016307	-4.381524	0.0032
D(GREXP(-3))	-0.035702	0.015982	-2.233811	0.0606
CointEq(-1)*	-0.248958	0.181246	-6.890956	0.0002

Source: Authors Computation using Eview-10 (2019)

The results of the short run dynamic explains that manufacturing lag values have a positive coefficient and it is statistically significant at 5% level i.e. previous manufacturing output status have positive and it is highly significant on current manufacturing sector. However, exchange rate does not have lag values i.e. the previous exchange rate status does not affect the manufacturing output, the coefficient of exchange rate is positive and this implies the current exchange rate has a positive relationship on current manufacturing output and it is statistically significant at 5% level. Government capital expenditure does not have lag values too and this implies that the previous government capital expenditure does not affect the current manufacturing output. There is a positive relationship between current government capital expenditure on current manufacturing output and it is statistically significant at 5% level of significance. Previous Consumer price index has an inverse relationship on current manufacturing output given a negative value of coefficient and it is statistically significant at 5%.

The equilibrium error correction coefficient (ECM) estimate of -0.248958 is highly statistically significant. This implies a mild speed of adjustment to equilibrium after a shock. Approximately 24.9% of disequilibrium from the previous year's corrected back to the long run equilibrium in the current year.

Table 6: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
GCEXP does not Granger Cause MO	29	9.72639	0.0008
MO does not Granger Cause GCEXP		22.9843	3.E-06
GREXP does not Granger Cause MO	29	3.78445	0.0373
MO does not Granger Cause GREXP		0.97032	0.3933
GREXP does not Granger Cause GCEXP	29	4.37952	0.0239
GCEXP does not Granger Cause GREXP		0.35858	0.7023

Source: Authors Computation using Eview-10 (2019)

The Pairwise Granger Causality Tests result in table 4.9 shows that there is unidirectional causality among the variables. GCEXP cause change in MO, but MO does not cause change in GCEXP. GREXP

cause change in MO, but MO does not cause change in GREXP

Conclusion and Recommendations

This study examined the relationship between government expenditure and economic growth in Nigeria using Dynamic Ordinary Least Square. This study adopts error correction mechanism computed through Dynamic Ordinary Least Squares. Empirical findings indicate that in the long run, government capital expenditure was positive and significant and therefore impacted significantly on manufacturing output in Nigeria. This showed that government can make use of expenditure on capital projects to influence manufacturing output in Nigeria. The findings further showed that government recurrent expenditures were positive but had insignificant impact on manufacturing output during the period under study. It was also discovered that the ECM was statistically significant and correctly signed. The speed of adjustment was 24.9%. The Pairwise Granger Causality Tests result shows that there is unidirectional causality among the variables. GCEXP cause change in MO, but MO does not cause change in GCEXP. GREXP cause change in MO, but MO does not cause change in GREXP.

The study recommends that there is need for government to reduce its budgetary allocation to recurrent expenditure and place more emphasis on the capital expenditures such as power, roads since capital expenditure has the greatest impact on the long-run with manufacturing sector output in Nigeria. Secondly, government should increase its funding of anti-graft or anti-corruption agencies like the Economic and Financial Crime Commission (EFCC), and the Independent Corrupt Practices Commission (ICPC) in order to arrest and penalize those who divert and embezzle public funds.

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