Original Research Article

Government Expenditure and Industrial Development in Nigeria: Long Run and Short Run Dynamics from ARDL Approach

Abstract
This study estimated the long run and short dynamics between government expenditure and industrial development in Nigeria from 1981 to 2016 with the view to evaluating how the industrial sector has been influenced by variation in government expenditure. The Autoregressive Distribute Lag (ARDL) was the technique applied. We found with dismay that government expenditure has not positively affected industrial development in Nigeria both in long run and short run despite the continuous rise in government expenditure and various policies of the government towards improving industrial performance in Nigeria. Funds allocated for environmental factors of production such as electricity, road, water, communication, etc. should be appropriately utilized. Political officer holders, contractors executing capital projects, people in corridors of powers, etc. who are embroil in misappropriation or embezzlement of public fund should properly tried and punished if found guilty.
Keywords: Government Expenditure; Industrial Development.

1. INTRODUCTION

Industrial development is a basic tool for attaining a desired level of economic growth and development by any nation hence, countries across the world develop and implement policies on industrialisation even our dear country: Nigeria (Echekoba & Ananwude, 2016). Theoretically, promoting economic growth and development through government expenditure is mainly viewed from two distinctive perspectives. The first is the Keynesian and endogenous theories proponents which posited that planned sectorial government expenditure is a veritable tool to achieving sustained growth. The classical together with neoclassical theories is the second aspect which in Twumasi (2012), view governments as inherently bureaucratic and less efficient, and as a result they tend to hinder rather than facilitate economic growth. Beyond the Keynesian and Neoclassical arguments, there is also the Ricardian economists who are of the opinion that a country could experience growth and development without government expenditure. In order words, changing the consumption pattern of citizens is cumbersome notwithstanding the amount of money the government injects in the economy through expenditure.

The priority of governments is to achieve a sustained economic growth which according to Mulugeta (2012), is the most important macroeconomic variable reflecting the overall performance of a society that results from producing more goods and services, which require improvement in productivity (through industrial sector development) and growth in the labour supply. If government expenditure acts as a complementary effect for private investment, it is expected that an increase in government expenditure will make a growth in production and employment (Fouladi, 2010).

Government expenditure in Nigeria has witnessed a tremendous rise in recent years. The Central Bank of Nigeria statistical bulletin of 2015 reveals that from 2011 to 2015, government total expenditure increased by only 5.55%. It was ₦4, 712.06 billion in 2011, ₦4, 605.39 billion in 2012, ₦5, 185.32 billion in 2013, ₦4, 587.39 billion in 2014 and ₦4, 988.86 billion in 2015. On recurrent and capital expenditure analysis, recurrent expenditure grew by 13.50% from ₦3, 314.51 billion in 2011 to ₦3, 831.95 billion in 2015, however, it is sad that capital expenditure which is supposed to increase productive economic activities declined by 12.24% from ₦918.55 billion in 2011 to ₦818.37 billion in 2015. The expenditure style of Nigeria has shown preference to recurrent expenditure compared to capital expenditure. Recurrent expenditure constitutes an average of 73.04% of total expenditure, while capital expenditure received a trifling 18.66%. Comparing the growth in total government expenditure and industrial development, it is crystal clear that industrial production index declined from 132 points in 2011 to 120.24 points in 2015. Industries shutdown their operations due to power failure, lack of basic infrastructures (bad and fragmented road network, rising inflation, exchange rate depreciation, etc.). The failure of government expenditure to propel growth and industrial development in Nigeria

remains a misery to the citizens, policy makers and those in the economic cycle hence, this study estimate the effect of government recurrent and capital expenditure on industrial development in Nigeria, for the period 1981 to 2016.

The rest of this paper is structured as follows: we presented supporting literatures in section two, estimation techniques in section three, empirical results and discussion were clearly portrayed in section four, whereas section five concluded the study.

2. SUPPORTING LITERATURES

Industrial Development

Industrial development is simply put as strategies by government in planning and setting up industries for employment creation, poverty alleviation, income equality, etc. which in turn results in growth in national output. Industrial development could be regarded as the heartbeat of every successful economy; this is due to the fact that it involves production and manufacturing of output in a large scale which simply opens up the economy to the outside world (Ayeyemi, 2013). Governments in most developing countries centres industrial development in special areas where they have comparative advantage relative to other nations especially, trading partners. Government is expected to provide extension and services and infrastructural facilities, which will stimulate investment and augment the productive capacity of the economy (Adebayo, Adebusuyi & Ishola, 2014). It is hard, if not impossible for any country to witness significant growth in its economy without a well-developed and dynamic manufacturing sector (Falade & Olagbaju, 2015). The focus on industrial development aspects of government spending in modern structures of economic development derives from the fact that the industrial sector is the vehicle for sustained growth in the long run due to the fact that industrial sector provides the necessary leverage for a competitive participation in foreign trade, expansion of domestic capacity and the generation of quality employment opportunities (Iweriebor, Egharevba & Adegboye, 2015). As the production of the output of the economy increases as a result of mass production of goods and services with the use of better utilization of technologies, materials and good labour capabilities, there is incidence of capital formation which invariably increases the economic performance of the country; foreign investor are wooed into the economy and job opportunities are created which in the long run reduces the rate of unemployment to the lowest minimum and also increase the foreign earning of the country as a result of huge receipts from goods export abroad (Ayeyemi, 2013).

Government Expenditure and Industrial Development: Relationship in Literature

The development of the industrial sector is critical in achieving a desired/target level of economic growth and development. This is owing to the fact that according to Iweriebor, Egharevba and Adegboye (2015), the industrial sector provides the necessary leverage for a competitive participation in foreign trade, expansion of domestic capacity and the generation of quality employment opportunities thus focus of government should be how to nourish and make this sector viable. Given the importance of manufacturing sector as the bedrock of economic growth and development, Nigeria, over the years, has employed several strategies which were aimed at enhancing the productivity of this vital sector as a means of achieving sustainable growth (Falade & Olagbaju, 2015). The nature of relationship between government expenditure and industrial sector performance has stimulated series of theoretical and empirical studies (Tawose, 2012). For an economy to attain industrial development there is need for its manufacturing production output to have a positive effect on its gross domestic product (Ayeyemi, 2013).

Barro (1990) has established a non-linear relationship between government expenditure which are complementary inputs to private production and a negative relationship between government consumption and growth of the economy. For Enu, Hagan and Attah-Obeng (2013), economic growth and development go with industrialization, and experience has shown that over the past four to five decades industrialisation has played crucial role in transforming many low-income countries to middle income countries, like South Korea, Malaysia, and Singapore. In the study of Nwanne (2015), it is posited that capital expenditure on road infrastructure and telecommunication affect the industrial sector output in Nigeria significantly while government capital expenditure on power has insignificant effect on manufacturing industrial and by implication, industrial sector output is clearly affected by factors both exogenous and endogenous to the government capital expenditure in Nigeria.

Prior Studies

Adebayo, Adebusuyi and Ishola (2014) empirically examined the relationship between all public expenditures and industrial growth in Nigeria between the periods of 1970–2012. The dependent variables used was index of industrial productivity which serves as a proxy for industrial growth while the explanatory variables are government expenditure on Administration, economic services, social and community services, and transfers. The findings of the co-integration result revealed a long run relationship between industrial growth and government expenditure components. However, the estimated results revealed that government expenditure on administration, economic services, and transfers maintain a negative long run relationship with industrial growth in Nigeria while government expenditure on social and community services maintain a positive long run relationship. The Granger causality test showed that there exist no directional causality between government expenditure components and industrial growth in Nigeria in two lag periods.

Falade and Olagbaju (2015) ascertained the relationship between government expenditure and manufacturing sector output in Nigeria. Government expenditure was disaggregated into capital and recurrent with a view to analyse the relative effect of these categories of government expenditure with emphasis on the capital component. The study employed time series data from 1970 to 2013. Data on manufacturing sector output, capital and recurrent expenditure, nominal and real Gross Domestic Product (GDP), exchange rate and interest rate were collected from Statistical Bulletin and Annual Report and Statement of Accounts published by the Central Bank of Nigeria (CBN). Econometric evidence revealed stationarity of the variables of interest at their first difference while the Johansen co-integration approach also confirms the existence of one co-integrating relationship. The error correction estimates revealed that while government capital expenditure has positive relationship with manufacturing sector output in Nigeria, recurrent expenditure exerts negative effect on manufacturing sector output.

Tawose (2012) determined the effect of public expenditure on industrial sector productivity in Nigeria. Ordinary least square multiple regression was adopted to carry out analysis on the relationship that exist between public expenditure and industrial sector productivity. In the model adopted, index of industrial production serves as proxy for industrial productivity, while total government expenditure, government expenditure on administration, government expenditure on economic services, and government expenditure on social and community services and government expenditure on transfer were proxies for government expenditure. The regression results showed that both government expenditure on administration and government expenditure on economic services have negative relationships with industrial productivity. The impact of each independent variable either negative or positive on industrial productivity is insignificant.

Iweriebor, Egharevba and Adegboye (2015) assessed the effect of public spending on the industrial sector in Nigeria using data covering the period 1980 to 2013. It was found in the study that that public spending has no significant effect on industrial production in the short run. Moreover, government spending has a relatively weak effect on industrial production even in the long run, suggesting a disconnection between public spending and the real sector of the economy.

Anwar and Zheng (2004) evaluated the impact of government-funded Research and Development in fostering the development of Singapore's industrial production in the 1990s. The study explicitly considered the performance of three industries within the manufacturing sector: the machinery and equipment industry, the electrical machinery industry, and the transport equipment industry. It was shown that the fluctuations in real government spending on Research and Development had a significant positive impact on the performance of the selected manufacturing industries.

Enu, Hagan and Attah-Obeng (2013) analysed impact of macroeconomic indicators on industrial production in Ghana. The ordinary least squares estimation technique was utilized given the sample size of 21 due to the unavailability of data. The study identified real petroleum prices, real exchange rate, import of goods and services and government spending as the key macroeconomic factors that influence industrial production in Ghana.

Nwanne (2015) used quantitative time series data and multiple regression techniques in the analysis to investigate the effect of government capital expenditure on the manufacturing sector output in Nigeria. The result of the co-integration test indicated long run relationship between dependent and independent variables. It was also revealed that capital expenditure on road infrastructure and telecommunication

affects the manufacturing sector output in Nigeria significantly while government capital expenditure on power has insignificant effect on manufacturing sector in Nigeria.

Nekarda and Ramey (2010) investigated industry-level effects of government purchases in order to shed light on the transmission mechanism for government spending on the aggregate economy. They began by highlighting the different theoretical predictions concerning the effects of government spending on industry labour market equilibrium and thereafter create a panel data set that matches output and labour variables to shifts in industry-specific government demand. The empirical results indicated that increases in government demand raise output and hours, but lower real product wages and productivity. Mark ups do not change as a result of government demand increases. The results were consistent with the neoclassical model of government spending, but they are not consistent with the New Keynesian model of the effects of government spending.

Njoku, Okezie and Idika (2014) addressed the relationship between Nigeria's capital expenditure and the growth of the manufacturing sector from 1971-2012. The ordinal least square method was used to show the relationship between capital expenditure and manufacturing output. Manufacturing Gross domestic product was taken as dependent variable while exchange rate, interest rate, political stability, recurrent expenditure, money supply, interest rate, index of energy consumption, credit to private sector, degree of openness and rate of growth of GDP as independent variables. The results suggested that there is a positive relation between rate of growth of GDP, capital expenditure, money supply, openness of the economy, recurrent expenditure and manufacturing output in the country.

Isaksson (2010) shaded light on how important public capital is for countries trying to industrialize and achieve faster economic growth. To this end, a small empirical model of industrial development was formulated and applied to manufacturing level and growth data for 57 advanced and developing countries for the time period of 1970 to 2000. In estimating the impact of public capital on industry special care was taken to deal with country-specific effects, reverse causality and endogeneity bias. The findings was clear: public capital has important explanatory power for why some countries have managed to industrialize, while others have not. Stages of development influence how strongly public capital matters, but there is evidence of impact at all income levels.

3. ESTIMATION TECHNIQUES

The Autoregressive Distribute Lag (ARDL) framework building on the model of Adebayo, Adebusuyi and Ishola (2014) was considered in estimating the long run and short run relationship between government expenditure and industrial development in Nigeria. We define industrial development in terms of index of industrial production, while government expenditure was described in term of the percentage changes in the two component of government expenditure: recurrent and capital expenditure. Adebusuyi and Ishola (2014) developed a model were index of industrial production is a function of government expenditure on general administration, economic services, transfers, social and community services. With this, we estimated an equation in the following form:

$$IPI_t = \beta_0 + \beta_1 GREXP_t + \beta_2 GCEXP_t + \varepsilon_t \quad (1)$$

Where: IPI is the changes in industrial production index in period t, $GREXP$ is government recurrent expenditure, $GCEXP$ is government capital expenditure, β_i are unknown parameters to be estimated, and ε is the usual random disturbance term.

4. EMPIRICAL RESULTS AND DISCUSSION

Unit Root Test

We report the result of the Augmented Dickey-Fuller (ADF) and Philip Peron (PP) at level and first difference in Tables 1 – 2 prior to undertaking the co-integration and ARDL long run and short run analysis. The unit root tests have provide evidence of the stationarity of the data.

Table 1: Result of ADF Test

		@ Level		
Variables	**Intercept**	**Trend and Intercept**	**None**	**Remark**
IPI	-2.056558 (0.26)	-2.008410 (0.57)	-0.320855 (0.56)	Not Stationary
GREXP	2.348498 (0.99)	-0.667090 (0.97)	3.933926 (0.99)	Not Stationary
GCEXP	-1.142910 (0.69)	-2.395787 (0.38)	-0.253794 (0.59)	Not Stationary
		@ First Difference		
IPI	-5.274653 (0.00)*	-5.266442 (0.00)*	-5.355890 (0.00)*	Stationary
GREXP	-5.733958 (0.00)*	-3.842017 (0.02)**	-4.775142 (0.03)**	Stationary
GCEXP	-7.475509 (0.00)*	-7.347241 (0.00)*	-7.361155 (0.00)*	Stationary

Source: E-views 9.0 version data output

Table 2: Result of PP Test

Variables	Intercept	Trend and Intercept	None	Remark
		@ Level		
IPI	-2.026837 (0.27)	-1.831757 (0.66)	-0.300373 (0.57)	Not Stationary
GREXP	2.535525 (1.00)	-0.530805 (0.98)	4.153049 (1.00)	Not Stationary
GCEXP	-1.026842 (0.73)	-2.395787 (0.38)	-0.080579 (0.65)	Not Stationary
		@ First Difference		
IPI	-5.246398 (0.00)*	-5.336097 (0.00)*	-5.343924 (0.00)*	Stationary
GREXP	-5.915199 (0.00)*	-7.678769 (0.00)*	-4.871698 (0.00)*	Stationary
GCEXP	-7.475509 (0.00)*	-7.347241 (0.00)*	-7.239692 (0.00)*	Stationary

Source: E-views 9.0 version data output

Diagnostic Test

Following the classical assumption of a linear regression model, we proceeded to testing the presence the presence of serial correlation, heteroskedasticity and stability of the model. From the result in Table 3, the model estimate would not suffer from serial correlation, heteroskedasticity and mis-specification issues (p-values > 0.05).

Table 3: Diagnostic Test

Estimated Model: IPI →GREXP + GCEXP	F-statistic	P-value
Serial Correlation LM Test	0.501918	0.6105
Harvey Heteroskedasticity Test	1.044632	0.3866
Ramsey Reset Specification	0.599658	0.5532

Source: E-views 9.0 version data output

Long Run Relationship

The stationarity of the data allow us to determine the long run relationship between industrial development and government expenditure. We deduce from Table 4 that industrial development is related in the long run with government expenditure. Relying on the f-statistic of 5.46 which is higher than lower bond value (3.79) and upper bond value (4.85), the null hypothesis of no co-integration is rejected at 5%b significance level. The nature of relationship in Table 5 reveals that recurrent and capital expenditure are negatively related with industrial development in Nigeria.

Table 4: ARDL Long Run Relationship

T-Test	5% Critical Value Bound		Remark
F-Statistic	Lower Bound	Upper Bound	
5.466695	3.79	4.85	Null Hypothesis Rejected

Source: E-views 9.0 version data output

Short Run Dynamics

In the short run dynamics, Table 5 depicts that both government recurrent and capital expenditure have negative insignificant relationship with industrial development in Nigeria within the period studied. Although the error correction coefficient showed the expected negative sign reflecting the tendency of the model to shift to equilibrium owing to imbalances in past period, only 24.23% error in previous years that are corrected in current year.

Table 5: ARDL Co-integrating and Long Run Form for IPI→GREXP+GCEXP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
		Co-integration Form		
D(GREXP)	-0.000010	0.000008	-1.134110	0.2679
D(GREXP(-1))	-0.000008	0.000010	-0.801460	0.4307
D(GREXP(-2))	-0.000001	0.000011	-0.059884	0.9527
D(GREXP(-3))	0.000027	0.000010	2.666708	0.0135
D(GCEXP)	-0.000015	0.000010	-1.574891	0.1284
CointEq(-1)	-0.242319	0.099160	-2.443711	0.0223
		Long Run Equation		
GREXP	-0.000012	0.000010	-1.227158	0.2317
GCEXP	-0.000063	0.000054	-1.169654	0.2536
C	143.528474	11.484598	12.497474	0.0000

Source: E-views 9.0 version data output

Effect Determination

The effect of government recurrent and capital expenditure on industrial development in Nigeria was evaluated with granger causality analysis and summarize in Table 6. There is no significant effect of government expenditure on industrial development in Nigeria as there is no flow of causality from any

direction (either from government expenditure to index of industrial production or from index of industrial production government expenditure) at a significance level of 5%.

Table 6: Effect Determination: Government Expenditure and Industrial Development

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
GREXP does not Granger Cause IPI	35	0.26300	0.6116	No Causality
IPI does not Granger Cause GREXP		0.04395	0.8353	No Causality
GCEXP does not Granger Cause IPI	35	0.03813	0.8464	No Causality
IPI does not Granger Cause GCEXP		2.17112	0.1504	No Causality

Source: Data output via E-views 9.0

Influence of Components of Government Expenditure on Industrial Development

To unveil the component of government expenditure that would have greater influence on industrial development, we constructed the variance decomposition of the estimated model which is detailed in Table 7. We discovered that it is capital expenditure and not recurrent expenditure that would result in better industrial development in developing economy like Nigeria with underdeveloped financial market. To further unravel the great influence of capital expenditure on industrial development, the impulse response function was estimated and the result condensed in Table 8. The impulse response function provides evidence that any shock in recurrent expenditure will only affect industrial development positively in the short run only but negatively in the long run. However, any shock in capital expenditure will affect industrial development negatively both long run and short run (see period 1 – 10 for both recurrent and capital expenditure and detailed in Table 8).

Table 7: Variance Decomposition

Period	S.E.	IPI	GREXP	GCEXP
1	10.68554	100.0000	0.000000	0.000000
2	15.01668	97.83349	1.627037	0.539471
3	16.64644	97.34599	1.353642	1.300368
4	17.69953	95.00104	1.204833	3.794125
5	18.38714	92.93891	1.243573	5.817518
6	18.98595	90.81427	1.396004	7.789729
7	19.48340	89.23078	1.612593	9.156630
8	19.90861	88.08408	1.873945	10.04197
9	20.25858	87.36270	2.155805	10.48150
10	20.53783	86.95678	2.453781	10.58944

Source: Data output via E-views 9.0

Table 8: Impulse Response Function

Period	IPI	GREXP	GCEXP
1	10.68554	0.000000	0.000000
2	10.31671	1.915459	1.102956
3	7.009591	0.286383	1.544947
4	5.278574	-0.153050	2.877953
5	4.074455	-0.655695	2.789673
6	3.625013	-0.909817	2.900188
7	3.371602	-1.043707	2.584468
8	3.225052	-1.142795	2.245618
9	3.069491	-1.191726	1.793179
10	2.870657	-1.225753	1.284292

Source: Data output via E-views 9.0

Discussion of Basic Results

The ARDL provides the existence of a long run relationship between government expenditure and industrial development in a developing country like Nigeria. however, from the data used in the analysis it was observe with dismay that government expenditure has not positively affected industrial development in Nigeria both in long run and short run despite the continuous rise in government expenditure and various policies of the government towards improving industrial performance in Nigeria. The effect determination discloses that recurrent and capital expenditure have no significant effect on industrial development in Nigeria. This could be attributed to the fact that fund allocated for government expenditure are mismanaged or siphon by politician and those in corridors of power. This findings is in unison with Adebayo, Adebusuyi and Ishola (2014) and Falade and Olagbaju (2015). The

poor performance of the Nigerian industrial sector is evidence in the huge importation of virtually everything consume in the country. Many industries have shut down operation, while some have relocated to other African countries. For instance, Erisco Food, a tomato paste company shut down its operation in Nigeria and relocated to Kenya on 6th November, 2016 owing to the harsh realities of doing business in Nigeria coupled with macroeconomic instability in exchange rate.

5. CONCLUDING REMARKS AND RECOMMENDATIONS

The sustainability of growth and development in an economy is largely dependent on the performance of the industrial sector. National output growth would be greatly deterred without a dynamic industrial activity. This study concludes that government expenditure over the years have not stimulated industrial development in Nigeria, and rises a major concern as what is wrong in the fiscal policy thrust of the Federal Government of Nigeria.

Nevertheless, to augment public expenditure on the path of improving industrial growth, funds allocated for environmental factors of production such as electricity, road, water, communication, etc. should be appropriately utilized. Political officer holders, contractors executing capital projects, people in corridors of powers, etc. who are embroil in misappropriation or embezzlement of public fund should properly tried and punished if found guilty. The use of anti-craft agencies such as the Economic and Financial Crime Commission (EFCC) to witch-hunt political enemies will in no way help the country in its ambition of being among the top twenty (20) economies in the world. Every individual (whether in the ruling party or the opposition party) enmeshed in misappropriation or embezzlement of funds for capital projects should be brought to justice in accordance with the anti-craft laws.

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