Public, Private Sector Investments and Growth of the Industrial Sector: A Panacea for Sustainable Economic Development in Nigeria.

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Abstract
The study examined public, private sector investments and growth of the industrial sector as panacea for sustainable economic development in Nigeria. This is in consideration of the fact that the industrial sector in Nigeria accounts for a tiny proportion of economic growth which has not translated to meaningful development as Nigeria ranks among the poorest countries in the world in spite of rising public and private sector investments profiles. This paper therefore is an investigation into the impact of public, private sector investments on industrial growth in Nigeria using time series data on public, private sector investments and industrial growth sourced from the Central Bank of Nigeria Statistical Bulletin and World Development Indicators from the period 1986 to 2016. Public sector investments were disaggregated into capital expenditures in the areas of economic services, social community services, administration and transfers, while private sector investments were decomposed into private domestic investments and foreign direct investments. In the same vein, industrial growth was proxied by industrial production index. The Johansen Cointegration Test and Vector Error Correction Mechanism were used for analysis. The cointegration results revealed the existence of long run relationship between public, private sector investments and industrial growth in Nigeria. The VECM showed that short run deviations can be corrected in the long run at the speed of -0.021876 approximately 2.19% with insignificant t-statistic of -0.90653. That is to say, though there is a long relationship, but the impact has not been statistically significant to infer causality. Further evidence of the analysis revealed that in the short run, only public sector investments in the area of economic services and private domestic investments contributed positively and significantly to the growth of the industrial sector in Nigeria. Therefore, the study recommended that government policies geared towards promoting industrial growth in the country through public and private sector investments especially in the areas of economic services and private domestic investments should be encouraged through sustainable increased expenditure.

Keywords: economic services, social community services, administration, transfers, private domestic investments, foreign direct investments, industrial production index.

Introduction
Over the years, public, private sector investments in developing economies seemed to have steadily increased and as such a continued analysis of its role in the economic development of these economies cannot be overemphasized. It is an important variable in the economic development of developed, underdeveloped and developing countries. Investment, whether public or private, depicts economic activity which involves the use of resources to produce goods and services. There is no doubt that gross domestic product growth rate and development

is higher for those countries with relatively higher investment. Thus, economic development literature acknowledges the importance of investment in the development process of any nation. Economic development on the other hand involves processes where low income national economies are transformed into modern industrial economies. During most of the 1960s and early 1970s, economists generally described the development process as structural change by which the reallocation of labour from the agricultural sector to the industrial sector was considered the key source for economic growth. Two well-known representatives of this approach are the Two-Sector Model (Lewis 1954), and the Structural Change and Patterns of Development (Chenery 1960).

Apart from being a "sine qua non" for growth and development, public and private sector investments nevertheless, is also an ardent booster of industrial growth, standard of living, employment rate, education, human capital development, per capita income among others. However, increases in investment in developing countries with little or no effect on the development indices have made investment a subject of national and international discourse. Economic development is a major macro-economic phenomenon that reflects the economic, social, political and technological well-being of a given people over time. In recent times, it has been measured by such indices as Human Development Index, Unemployment rate, Balance of Payments position, Political State and more especially the state of industrial development among others. That is to say, changes in the composition of inputs and output that generally include shifts in the underlying structure of production away from agricultural towards industrial activities are very essential.

According to Kalu and Mgbemena (2015), societal progress is directly and/or indirectly associated with investment expenditure; and investment is a propellant of economic growth and development. Growth and development of economies more importantly, stem from industrialization of such economies. Thus, as postulated by the classical economists, increased investment expenditure is a key to promoting long-run economic growth which leads to economic development with industrialization as one of its major component. Therefore, there is no gainsaying the fact that any nation that needs to meet her objective of economic development needs increased investments in the area of industrialization. From whatever theoretical angle that one may look at it, economic development indicates the ability of an economy to increase production of goods and services with the stock of capital and other factors of production within the economy (Nnanna, Englama and Odoko, 2004). There is no doubt that the remarkable record of high and sustained development of most economically advanced countries today are attributable to investments in industries, good development policies that are investment friendly in form of maintaining stable macroeconomic fundamentals, reliable legal and regulatory framework amongst others. This stems from the realization that countries that directed their resources to carefully chosen development drivers and put in place enabling policies especially aimed at stimulating investments in the identified development drivers achieve higher growth leading to economic development.

According to Chete, Adeoti, Adeyinka, and Ogundele (2012), the structure of the Nigerian economy is typical of an underdeveloped country. Over half of the gross domestic product (GDP) is accounted for by the primary sector with agriculture continuing to play an important role. The oil and gas sector, in particular, continues to be a major driver of the economy, accounting for over 95 per cent of export earnings and about 85 per cent of government revenue between 2011 and 2012. The sector contributed 14.8 and 13.8 per cent to GDP in 2011 and 2012, respectively. It also recorded an increase in reserves from 37.119 billion barrels in 2012 from 36.042 barrels in 2011. In contrast, the industrial sector in Nigeria (comprising

manufacturing, mining, and utilities) accounts for a tiny proportion of economic activity (6 per cent) while the manufacturing sector contributed only 4 per cent to GDP in 2011. This is despite policy efforts, over the last 50 years, and, in particular, more recently, that have attempted to facilitate the industrialization process. They further noted that despite the drive for industrial development1 in Nigeria dating back to the early 1960s with the first National Development Plan for the period 1962 - 1968. Under the First Plan the country embraced import-substituting industrialization (ISI) policy with the objective of mobilizing national economic resources and deploying them on a cost/benefit basis among contending projects as a systematic attempt at industrial development. It was observed that Nigeria's industrial production reached an all-time high of 20.1% in March 2011 and record low of -20.3% in March 2016. According to CBN (2015), this is in spite of the increasing public, private investments over the years. For instance, total capital investment expenditure rose from ₦6.57 billion in 1981 to ₦239.45 billion in 2000. This came to all time high of ₦1152.80 billion in 2009 before declining to N818.35 billion in 2015. In the same vein, private investment in the country rose from N8.6 billion in 1981 to ₦508.30 billion in 2000. This has continued to assume an upward trend such that in the first and last quarter of 2015 it came to ₦13,357.10 billion and ₦13,086.20 billion respectively. Unfortunately, rising public and private sector investments has not translated to meaningful development, as Nigeria ranks among the poorest countries in the world (CBN 2015). It is no doubt that investments, whether public or private, are geared towards the economic development of nations via growth in various facet of the economy amongst which is the industrial sector. However, the prevalent and worrisome state of the industrial sector of developing countries like Nigeria despite huge investment policies and programme, has raised enormous public debate on the impact of public and private investments on the growth of the industrial sectors; thus the need for this paper.

Conceptual Review
In economics, investment is the purchase of goods that are not consumed today, but are used in the future to create wealth. That is, it is the net increase in the existing stock of real capital assets such as machinery, building, plant and equipment. It also includes the increase that takes place in inventories (Kalra, 20007). In finance, investment connotes purchase of financial securities like share, bonds, debentures etc and financial derivatives like options, futures and the likes. Whichever way, investment is long term in nature and it has an opportunity cost. Jhingan (2006) stressed that investment leads to technical progress which helps to realize the economies of large-scale production, increases specialization, thus provides machines, tools and equipment for the growing labour force. Further noted is that investment leads to the expansion of market and helps to break vicious circles of poverty. For countries to develop, the proportion of its investment spending or savings for investment purposes must exceed that of consumption spending. Investment has been considered as one of the macro-economic variables for achieving price stability and promoting employment opportunities thereby contributing to sustainable economic growth that egenders development (Shimelis, 2014).

Generally, investment is basically classified into public investment and private investments. Public sector investments include government capital expenditures in the area of administration, social and community services, economic services and transfers. According to Nwinee and Torbira (2012) public sector investment comprises the summation of federal, states and local government spending as well as those of their agencies and financial transfers to the parastatals at the three tiers of governments. It is a form of investment that is not profit driven. Public sector investment represents significant portion of national investments. Government seeks to promote greater coordination of this type of investment. Private sector investment is the undertaken or promotion of investment by both local and foreign-based companies into

productive investments. Public investment which also means public sector investment primarily entails public or government capital expenditures. Public expenditure is an important instrument for government to control an economy. It plays an important role in the functioning of an economy whether developed, underdeveloped or developing. Public sector investment according to Okoro (2013) was born out of revenue allocation which refers to the redistribution of fiscal capacity between the various levels of government or the disposition of responsibilities between tiers of government.

According to Nnamocha (2002), government expenditure in the Nigerian context includes all expenditures on goods and services, transfers and capital expenditure by the Nigerian government. However, it excludes inter-governmental transfers. This limits government expenditure then to government expenditure on goods and services, and transfers to the non-government sector of the economy. It is the totality of the final public sector expenditure for whatever purposes. Equally, public expenditure in Nigeria can be broadly categorized into recurrent and capital expenditure. The former are government expenses on administration such as wages, salaries, interest on loans, maintenance etc., whereas the latter are expenses on projects like roads, airports, health education, telecommunication, electricity generation etc. Public sector investment represents significant portion of national investments. Government seeks to promote greater coordination of this type of investment. In other words, capital expenditure are permanent investments whose benefits last for a long period of time, usually beyond one accounting year or period while recurrent expenditures are routine expenditures whose benefits are used up entirely within one accounting period. Capital expenditure, no doubt, is an important aspect of public sector investment that transforms and engenders development of a nation. Public sector investment began to be more prominent in the management of the economy following the word of Meynard Keynes. Thus, in Nigeria, governments over the years embarked on diverse macroeconomic policy options to direct and redirect the economy on the path of growth and development.

On the other hand, private sector investment is the undertaken or promotion of investment by local private individuals/corporate bodies and foreign-based companies into productive investments. It comprises foreign direct investment, foreign portfolio investment and private domestic investment. The foreign investment when it is on tangible asset such as establishment of companies in a particular country by foreigners is otherwise referred to as Foreign Direct Investment (FDI). It is called portfolio investment when it is on shares, bonds, securities etc. (Bakare, 2011). Private sector investment is a form of investment that is profit oriented or profit elastic. Here, investors (individuals and corporate Individuals) are motivated and influenced by marginal efficiency of capital that is profit expectations and the rate of interest. Private sector investment (foreign or local) could be in form of private domestic investments and foreign private investment (foreign direct investment and foreign portfolio investment). Foreign Direct Investment, FDI for short, entails investment from one country into another, normally by companies rather than government. It involves establishing operations or acquiring tangible assets, including stakes in businesses in other countries, while foreign portfolio investment involves the purchase of one country's securities by nationals of another country.

Udo (2016) observed that private investment is generally conceptualized in terms of physical capital formation. He noted that private investment in physical capital, usually are undertaken by firms and individuals to accumulate, overtime, real capital goods, which yield a future flow of goods and services. The real capital goods, according to Soludo (1998), is classified into business fixed capital goods like new machinery and equipment, new factories and offices, other durable goods, investing in new techniques and product with the aim of improving the

quality and quantity of firm's output; and working capital such as cash, stock of raw materials and inventories. The private sector is also described by other names like capitalism, free enterprises system, the voluntary exchange economy, the market system and the profit system (Adamu, 2006). The role of the sector in propelling economic growth and development via employment and income generation amidst other potentials underscores the overwhelming emphasis and importance accorded private sector investment.

Issues on Public, Private Sector Investments and Industrial Growth in Nigeria.
Prior to the introduction of the structural adjustment programme (SAP) in 1986, Nigeria was operating more of mixed economy in which government owned and operated most public enterprises. However, with the emergence of SAP in 1986, the economy of the nation became more or less capitalist with major public enterprises either privatized or commercialized. In addition to this, there has been several national and economic development plans geared to some specific objectives like increase in real income of average citizen, reduction in unemployment, increased sectoral and regional development, maintenance of economic stability etcetera. These plans are achievable particularly through increased investments. Development models have come to accept that the rate of development of an economy is determined by the accumulation of physical and human capital, the efficiency of resource use and the ability to acquire and apply modern technology-investment. Todaro and Smith (2006) noted that any portrayal of the structural diversity of developing nations requires an examination of eight critical components. These include such diversities as the size of the country, its historical and colonial background, endowments of physical and human resources, coupled with ethnic and religious composition. Others are the relative importance of its public and private sectors, the degree of dependence on external economic and political forces as well as the diversity in the distribution of power and the institutional and political structure within the nation. The role of the industrial sector in propelling economic growth and development via employment and income generation amidst other potentials underscores the overwhelming emphasis and importance accorded public and private sector investments.

It is on literature that the real production output in the industrial sector of any economy is among the major determinants of economic development of a given country. In other words, economic development demands increase in real output of the industrial sector, which undisputable depends and/or requires investment from both the public and private sectors. Public sector investments in form of capital expenditure in the areas like economic services (provision of infrastructure, agriculture, transportation, communication and other economic services), social and community services etc, no doubt engender investment friendly environment and further deepen on the money supply in an economy. On the other hand, availability and easy access to investment funds, investment friendly environment etc, attracts private sector investments (for example FDI) in the areas of manufacturing, agriculture which further enhance and improve the real output of a country and as well as the index of production or production index.

Investment (public and private) expenditures are channeled to raising or maintaining the stock of capital. These stocks of capital include tangible assets, plants and machines etc which aid production. In addition, provisions of infrastructure among others are relevant factors needed for encouraging and improving economic activity. According to Ade (2005), no sector, be it agricultural, manufacturing, mining etc can survive without the requisite investment from the public and private sector. The public sector provides and promotes investment friendly environment through capital expenditure upon which the private sector often relies to foster or facilitate production. The industrial sector is an economic designation devoted to producing

goods as opposed to sectors devoted to providing services and raw materials products. Financial analyst and economists consider a strong industrial sector to be a sign of well-functioning economy with a high GDP and high quality of life (Economic Watch, 2016).

Nurkse (1973) asserted that for an economy to attain a level of development, all her resources/reserves must not be forwarded completely to current consumption but rather greater portions should be allocated to capital goods. The study further explains that allocation of some quantum of a nation's resources on investment such as plants, machinery, tools, equipment will help in stimulating the productive capacity of the economy, such that it will increase stock of capital goods which will in turn promote the productive output of the nation in the future

Industrial Production Index (IPI) in Nigeria decreased 1.10% in the first quarter of 2017 over the same quarter in the previous year. IPI in Nigeria averaged 1.29% from 2007 until 2017, reaching an all-time high of 20.10% in the first quarter of 2011 and a record low of -10.10% in the first quarter of 2016 (CBN 2016). As earlier pointed out, it was observed that Nigeria's industrial production reached an all-time high of 20.1% in March 2011 and record low of -20.3% in March 2016.This is amidst rising public, private sector investment expenditures profile.

The Industrial sector is an economic designation devoted to producing goods as opposed to sectors devoted to providing services and raw materials products. Financial analyst and economists consider a strong industrial sector to be a sign of well-functioning economy with a high GDP and high quality of life (Economic Watch, 2016). Nurkse (1973) asserted that for an economy to attain a level of development, all her resources/reserves must not be forwarded completely to current consumption but rather greater portions should be allocated to capital goods.

Theoretical Framework
The study relies on the Structural Change Theory of economic development. During most of the 1960s and early 1970s, economists generally described the development process as structural change by which the reallocation of labour from the agricultural sector to the industrial sector was considered the key source for economic growth. Two well-known representatives of this approach are the two-sector model (Lewis 1954), and the structural change and patterns of development (Chenery 1960).

In Lewis' (1954), the Two-Sector Model or theory of surplus labour, labour increasingly moves away from the agricultural sector to the industrial sector. However, with unlimited supply of labour from the traditional sector, these transferred workers continually received only subsistence wages. The excess of modern sector profits over wages and hence investments in the modern sector continued to expand and generate further economic growth on the assumption that all profits would be reinvested. Both labour transfer and modern sector employment growth were in turn brought about by output expansion in that sector. This process of modern sector self-sustaining growth and employment expansion facilitated the structural transformation from a traditional subsistence economy to a more modern developed economy to take place. Like the Harrod–Domar model, the Lewis model considered savings and investments to be the driving forces of economic development in the context of the less developed countries.

Although promoting the roles of savings and investments, the structural change and patterns of development analysis extended in comparison with the Lewis model. The analysis identified

that the steady accumulation of physical and human capital are among conditions necessary for economic growth, apart from savings and investments. Moreover, the structural changes occurred not only in the two sectors but also in all economic functions, including the change in consumer demand from an emphasis on food and basic necessities to desires for diverse manufactured goods and services, international trade and resource use as well as changes in socioeconomic factors such as urbanization and the growth and distribution of a country's population.

Empirical Review

Bojunjoko (1998) assessed the private and public investment nexus, growth and policy reforms in Nigeria. He employed the VAR approach to accelerate as well as project inter-temporally, private investment response to its major shocks namely, domestic credit, public investment, as well as output shocks. The result(s) of the VAR illustrates that government strategies that create sustainable growth output, stable public investment and encourage the availability of domestic credit to the private sector will support investment in the long run and short run. Daibi (2014) employed a review approach to examine the challenges and opportunities of Nigeria's industrial development since the past seventy years (1943 – 2013). It described the history of industrialization while critiquing the process as well as impact of industrial policies formulation and implementation on Nigeria's industrialization since 1943. It was observed that there were multiplicity of industrial policies, most of which were either discontinued at their prime stages by succeeding governments or were interrupted by exogenous factors whose effects were never factored into these policies. It was also revealed that some of these policy changes were mere semantic differences as the concepts and models for implementation remained the same. Jelilov, Enwerem and Isik (2016) investigated the Impact of Industrialization on Economic Growth (2000-2013). The study sets three major objectives, which include investigating the effect of fiscal and monetary policy on Gross Domestic Product (GDP), determining the relationship between government spending and industrial development and to determine the effect of budget on investment or employment generation. The study only utilized secondary data from the 2011 Central Bank of Nigeria Statistical Bulletin and the Nigerian National Bureau of Statistics. The study specified a workable model, which has GDP as the dependent variable while industrial output, foreign direct investment, interest rate, foreign exchange rate and inflation rate were independent variables. Ordinary least square (OLS) technique, F-test was used as analytical techniques. The study revealed that industrialization has a negative impact on economic growth in Nigeria in the long run. Chukwuedo and Ifere (2017) in their study on Nigeria, noted that manufacturing subsector has become increasingly important as the engine and driver of economic growth in both developing and developed economies. Their study set out to investigate the relationship between manufacturing output and economic growth. The analysis was conducted using time series data from the period of 1981-2013. To quantify the relationship between manufacturing output and economic growth, an eclectic model consisting of both the Kaldor's first law of growth and the endogenous growth model was estimated. Findings from the study showed that manufacturing output, capital and technology were the major determinants of economic growth. Results also revealed that quality of institutions and labour force does not exert any impact on economic growth. Udo (2014) noted that in a quest for industrialization in Nigeria, different industrial policies have been implemented. This study explores the industrial policies and the performance of industrial sector. The findings of the study showed that the policies, identified as ISI, EPI and FPII, have not helped Nigeria to attain the required level of industrialization that could produce dynamic change in the economic structure of the country and the performance of industrial sector especially as manufacturing had been below expectation. The

policies have a common feature of foreign inputs reliance which make their successful implementation in Nigeria very costly.

3.0   Methodology

This study adopted the Vector Error Correction Mechanism (VECM) to empirically examine the existence of long run relationship between public, private sector investments and industrial growth in Nigeria. Time series data on public, private sector investments were sourced from the Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics, while, data on Industrial Production Index were sourced from World Development Indicator published by World Bank and United Nations Development Programme (UNDP), from the period 1986 to 2016.

Model Specification

The choice of the variables considered were drawn from the literature of this work. Therefore, the model for the study is as specified below:

$$IPI = f (ECS, TRS, ADM, CMS, PDI, FDI)………………………(1)$$

From the above functional relationship, the model equation to be estimated is presented below:

$$IPI_t = \alpha_{01} + \alpha_{11t}ECS_{t-1} + \alpha_{21t}TRS_{t-1} + \alpha_{31t}ADM_{t-1} + \alpha_{41t}CMS_{t-1} + \alpha_{51t}PDI_{t-1} + \alpha_{61t}FDI_{t-1} + \mu_{1t} \text{ --(2)}$$

IPI	=	Industrial Production Index
ECS	=	Economic Services
TRS	=	Transfers
ADM	=	Administration
CMS	=	Community service
PDI	=	Private Domestic investment
FDI	=	Foreign direct investment
t	=	time t
$\alpha_1 - \alpha_6$	=	Parameters to be estimated or slope
α_0	=	Intercept.

4.0   Data Presentation, Estimation and Results

Table 4.1: Table of Public, Private Sector Investments and Economic Development variables in Nigeria (Administration, ADM; Economic Services, ECS; Social and Community Service, CMS; Transfers, TRS Foreign Direct Investment, FDI; Industrial Production Index, IPI and Private Domestic Investment, PDI)

YEAR	ADM ₦'b	ECS ₦'b	FDI ₦'b	IPI Rate (%)	PDI ₦'b	CMS ₦'b	TRS ₦'b
1986	0.26	1.1	0.7358	103.5	0.01135	0.66	6.51
1987	1.82	2.16	2.4528	122.1	0.01523	0.62	1.78
1988	1.9	2.13	1.7182	108.8	0.01756	1.73	2.59
1989	2.62	3.93	13.8774	125	0.02683	1.84	6.65
1990	2.92	3.49	4.686	130.6	0.04012	2.1	15.55
1991	3.35	3.15	69.161	138.8	0.04519	1.49	20.36
1992	5.12	2.34	14.4631	136.2	0.07081	2.13	30.18
1993	8.08	18.34	29.6603	131.7	0.09692	3.58	24.5
1994	8.79	27.1	22.2	129.2	105.58	4.99	30.04
1995	13.34	43.15	75.9	128.8	141.92	9.22	55.44
1996	14.86	117.83	113.3	132.5	204.05	8.66	71.58
1997	49.55	169.61	110.5	140.6	242.9	6.9	43.59
1998	35.27	200.86	80.7	133.9	242.26	23.37	49.52
1999	42.74	323.58	92.8	129.1	231.66	17.25	114.46
2000	53.28	111.51	116	138.9	331.06	27.97	46.7
2001	49.25	259.76	132.4	144.1	372.14	53.34	76.35
2002	73.58	215.33	225.2	145.2	499.68	32.47	0.0001
2003	87.96	97.98	258.4	147	865.88	55.74	0.01
2004	137.77	167.72	248.2	151.2	863.07	30.03	15.73
2005	171.57	265.03	654.2	158.8	804.4	71.36	11.5
2006	185.22	262.21	624.5	166.8	1546.53	78.68	26.27
2007	226.97	358.38	759.4	175.2	1936.96	150.9	23.04
2008	287.1	504.29	971.5	184.7	2053.01	152.17	17.33
2009	291.66	506.01	1273.8	114.6	3050.58	144.93	210.2
2010	260.2	412.2	905.7	127.9	9183.059	151.77	59.7
2011	231.8	386.4	1360.3	133	8425.762	92.85	207.5
2012	190.5	320.9	113.5	137.6	8640.765	97.4	265.9
2013	283.65	505.77	875.1	139.2	9320.347	154.71	164.27
2014	229.63	393.45	738.2	139.45	10571.74	111.29	48.75
2015	226.81	348.75	602.1	118.8	10432.23	82.98	159.82
2016	150.3535	261.2776	1124.1	108.5	3345.578	79.63	143.5266

Source(s):   **(1) Central Bank of Nigeria Statistical Bulletin, 2016**
　　　　　　　　(2) World Development Indicators Published by World Bank, 2016

Unit Root Tests
Table 4.2: Summary of Augmented Dickey-Fuller Unit Root Tests Results

Variables	ADF t-statistic	McKinnon critical values 5%	ADF Probability Values	Stationarity ~I(d)
ADM	-4.939762	-2.967767	0.0004	1(1)
ECS	-6.757016	-2.967767	0.0000	1(1)
FDI	-10.84952	-2.967767	0.0000	1(1)
IPI	-6.414395	-2.967767	0.0000	1(1)
PDI	-3.151528	-2.967767	0.0337	1(1)
CMS	-6.262084	-2.967767	0.0000	1(1)
TRS	-8.387738	-2.967767	0.0000	1(1)

Source: e-views 9.0 output

Table 4.2 above shows the summary result of the ADF unit root tests for each of the variables. The analysis was carried out because results obtained by using non-stationary time series may be spurious in that they may indicate a relationship between two variables where none exist. Non-stationary can be trends, cycles, random walks or combinations of the three.

The results revealed that at first difference, the value of the ADF t-statistics for each of the variables (in absolute value) were more than the mckinnon critical values at 5% level of significance. In addition, all the probability values were less than 5% level of significance, thus leading to the rejection of the null (H_0) hypotheses that there is a unit root and acceptance of the alternative hypotheses (H_1) of no unit root. Consequently, the variables are confirmed to be integrated of order I(I) or stationary at first difference which qualifies the proposed model for long run or cointegration analysis.

Johansen Cointegration Results
The Trace Statistic and Maximum Eigenvalue was applied on the model to establish the presence or absence of long-run relationship between the variables, having satisfied the condition for cointegration.

Table 4.3: Long Run Relationship

Date: 10/21/18   Time: 07:23
Sample (adjusted): 3 31
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: IPI ADM CMS ECS TRS PDI FDI
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.965514	236.9301	125.6154	0.0000
At most 1 *	0.852497	139.2812	95.75366	0.0000
At most 2 *	0.755739	83.77785	69.81889	0.0026

At most 3	0.551276	42.90178	47.85613	0.1350
At most 4	0.336994	19.66273	29.79707	0.4460
At most 5	0.179864	7.744551	15.49471	0.4931
At most 6	0.066457	1.994274	3.841466	0.1579

Trace test indicates 3 cointegratingeqn(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 *	0.965514	97.64887	46.23142	0.0000
At most 1 *	0.852497	55.50334	40.07757	0.0005
At most 2 *	0.755739	40.87607	33.87687	0.0062
At most 3	0.551276	23.23905	27.58434	0.1635
At most 4	0.336994	11.91817	21.13162	0.5558
At most 5	0.179864	5.750277	14.26460	0.6455
At most 6	0.066457	1.994274	3.841466	0.1579

Max-eigenvalue test indicates 3 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: e-views 10.0

Tables 4.3 above shows that both the trace statistic and maximum eigenvalue test of the Johansen cointegration test results indicates four (3) cointegrating equations at 5% level of significance, thus establishing the existence of long-run relationship among the variables. Therefore, having established that the variables are cointegrated, the vector error correction model (VECM) was applied to determine the speed of adjustments of any disequilibrium in the long run among the variables that are cointegrated.

Vector Error Correction Estimates
The VECM was used to investigate if the errors in the short-run are likely to be corrected such that in the long run we have the same result. Also, if the errors are adjustable, the degree or level of errors that can be adjusted.

Table 4.4 Error Correction:	D(IPI)
CointEq1	-0.021876
	(0.02413)
	[-0.90653]

Source: e-views 10.0

The Error Correction result showed that the error correction term for Industrial Production Index (IPI) is properly signed with a negative coefficient of -0.021876 and insignificant t-statistic of

-0.90653. This result reveals that approximately 2.19% of disequilibrium in the short run is corrected every year by changes in public, private sector investments in the long run. This is to say that the claims of long run equilibrium relationship are sustained and adjustments from the short run can be corrected in the long run at the speed of 2.19%.

Table 4.5 Least Square System Equation
Dependent Variable: D(IPI)
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 10/23/18   Time: 13:57
Sample (adjusted): 4 31
Included observations: 28 after adjustments
D(IPI) = C(1)*(IPI(-1) - 53.2557011797*ADM(-1) - 0.99557176812*CMS(-1)
    + 3.72245741537*ECS(-1) + 12.1909866546*PDI(-1) +
    47.2075007721*FDI(-1) + 2.25690248011) + C(2)*D(IPI(-1)) + C(3)
    *D(ADM(-1)) + C(4)*D(CMS(-1)) + C(5)*D(ECS(-1)) + C(6)*D(PDI(-1)) +
    C(7)*D(FDI(-1)) + C(8)*D(IPI(-2)) + C(9)*D(ADM(-2)) + C(10)*D(CMS(
    -2)) + C(11)*D(ECS(-2)) + C(12)*D(PDI(-2)) + C(13)*D(FDI(-2)) + C(14)
    + C(15)*TRS

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.021876	0.024132	-0.906528	0.3812
C(2)	-0.145282	0.163355	-0.889364	0.3900
C(3)	-2.085156	1.512464	-1.378648	0.1913
C(4)	0.030855	0.389016	0.079316	0.9380
C(5)	0.322217	0.324364	0.993382	0.3387
C(6)	0.784854	0.775190	1.012467	0.3298
C(7)	-0.472930	0.813616	-0.581269	0.5710
C(8)	-0.158647	0.283712	-0.559182	0.5855
C(9)	0.627918	1.123566	0.558862	0.5858
C(10)	-0.605819	0.407268	-1.487518	0.1607
C(11)	0.801634	0.347792	2.304922	0.0383
C(12)	3.347328	0.886138	3.777436	0.0023
C(13)	-0.821531	0.504993	-1.626816	0.1278
C(14)	-0.172260	0.159502	-1.079991	0.2998
C(15)	-1.221104	0.196307	-6.220394	0.0000

R-squared	0.848118	Mean dependent var	-0.000593
Adjusted R-squared	0.684552	S.D. dependent var	0.865833
S.E. of regression	0.486293	Akaike info criterion	1.700162
Sum squared resid	3.074250	Schwarz criterion	2.413843
Log likelihood	-8.802271	Hannan-Quinn criter.	1.918342
F-statistic	5.185189	Durbin-Watson stat	1.489944
Prob(F-statistic)	0.002621		

Source: e-views 10.0
To actually establish whether the t – statistics (-0.90653) of the error correction term is significant and confirm causality between Industrial Production Index and public, private sector investments, the least square system equation for IPI shown on table 4.5 above was extracted and estimated.

The result of the least square system equation shows that C (1) -0.021876 is the coefficient of the cointegrated model for IPI and represents the speed of adjustments towards long run equilibrium. Furthermore, it must be negative to correct short run deviations in the long run. With a probability of 0.3812 > 5% (insignificant), causality cannot be inferred. In other words, the study concludes that public, private sector investments statistically, do not granger cause or have significant impact on industrial growth in Nigeria. Other findings emanating from the least square system equation test result showed the results of short run relationship and significance. The result indicates that in the short run, only public sector investments in the area of economic services and private domestic investments lagged two periods have positive relationship and significant impact on industrial growth in Nigeria with probability values of 0.0383 (C11) and 0.0023 (C12) < 5% respectively. These results are in conformity with our a priori expectations. Although, there appeared to be positive relationship between public sector investments lagged one period in the areas of social community services (C4) and administration (C9), but they have no significant impact on industrial growth in Nigeria. Still on the same model, The Durbin-Watson statistic value of 1.489944 from the least squares equation shows the absence of autocorrelation.

Table 4.6 Serial Correlation Test Result
Breusch-Godfrey Serial Correlation LM Test:

| F-statistic | 3.416103 | Prob. F(2,11) | 0.0702 |
| Obs*R-squared | 10.72788 | Prob. Chi-Square(2) | 0.0947 |

Source: e-views 10.0

The DW statistic on table 4.5 depicts the presence of auto correlation. In any case, the Breusch-Godfrey Serial Correlation LM Test was used to test for serial correlation in order to address the problem of autocorrelation. The result in table 4.6 above shows that there is no serial correlation in the residuals equations with F-statistic of 3.416103 and probability F (2, 11) 0.0702 as well as obs* R-squared of 10.72788 and prob. Chi-square (2) 0.0947.

Discussion of Results
The study examined the impact of public, private sectors investments and industrial growth as a panacea for sustainable economic development in Nigeria. A most enduring debate in literature is whether public, private sector investments have any effect on industrial growth especially in Nigeria. This is in consideration of the fact that despite the increasing status of public, private investments in Nigeria, industrial growth still stagnates as earlier enumerated in literature. This is in expectation of the fact that public and private sector investments engender industrial growth or development. The data collected for the study were subjected to unit root test to establish the stationarity of the variables included in the study. The Augmented Dickey-Fuller test results showed that the variables were integrated at order I(I) or stationary at first difference. This satisfied the conditions that necessitated the adoption of the analytical technique used in the evaluation of the model proposed by the researcher.

In order to ascertain the existence of long-run relationship between public, private sector investments and industrial production index, the Johansen cointegration test for long run analysis was employed. The results of the test revealed that both the trace statistics and the maximum eigenvalue showed three (3) cointegrating equation at 5% level of significance. This, in other words, confirms the existence of long-run relationship between the public, private

sector investment variables and the concerned industrial growth indicator/variable. That is to say, what is obtainable in the short-run also persists in the long-run.

The Vector Error Correction result showed that the error correction term for industrial production index is properly signed with a negative coefficient of -0.021876 and insignificant t-statistic of-0.90653. This result reveals that approximately 2.19% of disequilibrium in the short run is corrected every year by changes in public, private sector investments in the long run. These shows that public, private sector investments on administration, economic services, social and community service, transfers, private domestic investment and foreign direct investments has not significantly yielded the desired result in the area of industrial sector development given the insignificant t-statistic of -0.90653. This further confirms the reason for the downward trend witnessed in the areas of industrial sector growth in Nigeria in recent times.

Conclusion
Theoretically, it was expected that public and private sector investments disaggregated into administration, economic services, social community services, transfers, private domestic investment and foreign direct investment have significant positive effect on industrial production index which leads to economic development. However, the result of the VECM analysis showed that public, private sector investments have not translated into meaningful development in the area of industrial production index within the period under review. This suggests lack of policy coordination on the part of concerned authorities and therefore calls for a rethink on the part of stakeholders and the need to revisit policies geared towards the achievement of industrial growth through public, private sector investments in Nigeria.

Recommendations
On the basis of the findings and conclusion drawn from this research work, the following recommendations were suggested:

1. Government policies geared towards promoting industrial growth in the country through public and private sector investments in the areas of economic services and private domestic investments should be sustained through increased expenditure. This is because public and private sector investments in these areas in the short run have shown to be a vital policy instrument towards the advancement of industrial growth in Nigeria.

2. Given the result that neither public sector investments nor private sector investments alone have significant impact on industrial production index in the long run, policy makers should adopt a holistic approach that will encourage the growth of the industrial sector.

3. Government and stakeholders in the private sector should rethink their pattern of expenditure on the industrial sector in order to facilitate the growth of the industrial sector.

4. Policies that promote fluctuation of public, private sector investments especially in the area of industrial growth should be revisited while policies that encourage greater and sustained investments in these areas should be sustained. Through this means government and its agencies can guarantee adequate provision of infrastructural facilities like good roads, electricity, etc.

5. Sustainable policies that will ensure and encourage growth of private sector investments should be vigorously pursued by stakeholders in the industry. These policies could come in form of access to cheap funds, subsidization of inputs in the production process, tax waivers for newly established firms among other policy initiatives.

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Appendix
Vector Error Correction Estimates
Date: 10/21/18   Time: 10:47
Sample (adjusted): 4 31
Included observations: 28 after adjustments
Standard errors in ( ) & t-statistics in [ ]

CointegratingEq:	CointEq1
IPI(-1)	1.000000
ADM(-1)	-53.25570
	(0.95863)
	[-55.5541]
ECS(-1)	3.722457
	(0.24413)
	[15.2478]
CMS(-1)	-0.995572
	(0.55843)
	[-1.78281]
PDI(-1)	12.19099
	(0.34173)
	[35.6739]
FDI(-1)	47.20750
	(0.97759)
	[48.2897]
C	2.256902

Error Correction:	D(IPI)	D(ADM)	D(ECS)	D(CMS)	D(PDI)	D(FDI)
CointEq1	-0.021876	0.008795	0.030009	-0.012164	0.056353	-0.050832
	(0.02413)	(0.00869)	(0.01905)	(0.01835)	(0.01781)	(0.01054)
	[-0.90653]	[1.01177]	[1.57551]	[-0.66290]	[3.16417]	[-4.82102]
D(IPI(-1))	-0.145282	0.012803	0.031423	-0.038267	-0.299845	0.079476
	(0.16336)	(0.05884)	(0.12893)	(0.12421)	(0.12056)	(0.07137)
	[-0.88936]	[0.21758]	[0.24371]	[-0.30807]	[-2.48714]	[1.11352]
D(IPI(-2))	-0.158647	-0.082633	-0.102178	-0.010157	-0.134946	0.056169
	(0.28371)	(0.10220)	(0.22393)	(0.21573)	(0.20938)	(0.12396)
	[-0.55918]	[-0.80855]	[-0.45630]	[-0.04708]	[-0.64450]	[0.45312]
D(ADM(-1))	-2.085156	0.803481	2.567953	0.448707	3.296810	-1.416097
	(1.51246)	(0.54482)	(1.19376)	(1.15005)	(1.11622)	(0.66083)
	[-1.37865]	[1.47476]	[2.15115]	[0.39016]	[2.95356]	[-2.14290]

D(ADM(-2))	0.627918	0.922203	2.015248	-0.365826	3.275768	-2.226765
	(1.12357)	(0.40473)	(0.88681)	(0.85434)	(0.82921)	(0.49091)
	[0.55886]	[2.27855]	[2.27247]	[-0.42820]	[3.95049]	[-4.53596]
D(ECS(-1))	0.322217	0.011526	-0.657364	0.156939	-0.037900	0.168628
	(0.32436)	(0.11684)	(0.25601)	(0.24664)	(0.23938)	(0.14172)
	[0.99338]	[0.09864]	[-2.56768]	[0.63631]	[-0.15832]	[1.18985]
D(ECS(-2))	0.801634	0.029810	-0.328829	0.549656	0.180154	-0.229153
	(0.34779)	(0.12528)	(0.27451)	(0.26445)	(0.25668)	(0.15196)
	[2.30492]	[0.23794]	[-1.19790]	[2.07845]	[0.70188]	[-1.50799]
D(CMS(-1))	0.030855	0.356037	0.649316	-0.105601	0.253858	-0.028030
	(0.38902)	(0.14013)	(0.30704)	(0.29580)	(0.28710)	(0.16997)
	[0.07932]	[2.54072]	[2.11474]	[-0.35700]	[0.88422]	[-0.16491]
D(CMS(-2))	-0.605819	0.187630	0.119389	-0.065709	0.358616	-0.151781
	(0.40727)	(0.14671)	(0.32145)	(0.30968)	(0.30057)	(0.17795)
	[-1.48752]	[1.27894]	[0.37141]	[-0.21218]	[1.19312]	[-0.85296]
D(PDI(-1))	0.784854	-0.520837	-1.019107	-0.571219	-0.434224	0.751774
	(0.77519)	(0.27924)	(0.61184)	(0.58944)	(0.57210)	(0.33870)
	[1.01247]	[-1.86519]	[-1.66564]	[-0.96909]	[-0.75900]	[2.21959]
D(PDI(-2))	3.347328	0.710383	0.296822	1.386888	0.460406	-1.046372
	(0.88614)	(0.31921)	(0.69941)	(0.67380)	(0.65398)	(0.38718)
	[3.77744]	[2.22547]	[0.42439]	[2.05830]	[0.70401]	[-2.70258]
D(FDI(-1))	-0.472930	-0.902368	-1.566285	-0.371655	-2.435926	1.243248
	(0.81362)	(0.29308)	(0.64217)	(0.61866)	(0.60046)	(0.35549)
	[-0.58127]	[-3.07889]	[-2.43905]	[-0.60074]	[-4.05678]	[3.49729]
D(FDI(-2))	-0.821531	-0.157718	-0.356481	0.193875	-1.152351	0.946971
	(0.50499)	(0.18191)	(0.39858)	(0.38399)	(0.37269)	(0.22064)
	[-1.62682]	[-0.86701]	[-0.89437]	[0.50490]	[-3.09197]	[4.29185]
C	-0.172260	-0.059941	-0.085267	-0.054398	-0.302691	0.277940
	(0.15950)	(0.05746)	(0.12589)	(0.12128)	(0.11771)	(0.06969)
	[-1.07999]	[-1.04325]	[-0.67731]	[-0.44852]	[-2.57140]	[3.98822]
TRS	-1.221104	-0.202511	-0.000983	-0.281931	-0.271541	0.259701
	(0.19631)	(0.07071)	(0.15494)	(0.14927)	(0.14488)	(0.08577)
	[-6.22039]	[-2.86380]	[-0.00634]	[-1.88876]	[-1.87429]	[3.02784]
R-squared	0.848118	0.860246	0.745941	0.718507	0.758917	0.965176
Adj. R-squared	0.684552	0.709743	0.472340	0.415362	0.499288	0.927673
Sum sq. resids	3.074250	0.398914	1.915147	1.777466	1.674429	0.586884
S.E. equation	0.486293	0.175173	0.383822	0.369768	0.358890	0.212473
F-statistic	5.185189	5.715776	2.726376	2.370171	2.923090	25.73603

Log likelihood	-8.802271	19.78671	-2.176539	-1.132062	-0.296027	14.38158
Akaike AIC	1.700162	-0.341908	1.226896	1.152290	1.092573	0.044173
Schwarz SC	2.413843	0.371773	1.940577	1.865971	1.806254	0.757854
Mean dependent	-0.000593	0.050250	0.054143	0.050632	0.032832	0.093682
S.D. dependent	0.865833	0.325144	0.528387	0.483599	0.507187	0.790049

Determinant resid covariance (dof adj.)	1.23E-09
Determinant resid covariance	1.23E-11
Log likelihood	113.3479
Akaike information criterion	-1.239137
Schwarz criterion	3.328421
Number of coefficients	96

Serial Correlation Test Result

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.416103	Prob. F(2,11)	0.0702
Obs*R-squared	10.72788	Prob. Chi-Square(2)	0.0947

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/25/18   Time: 11:49
Sample: 4 31
Included observations: 28
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.000145	0.020614	0.007013	0.9945
C(2)	0.023920	0.158771	0.150659	0.8830
C(3)	-0.061693	0.334950	-0.184186	0.8572
C(4)	-0.092133	0.294998	-0.312318	0.7606
C(5)	0.031951	1.296268	0.024649	0.9808
C(6)	0.304520	0.714769	0.426040	0.6783
C(7)	0.055362	0.698262	0.079285	0.9382
C(8)	0.247241	0.280695	0.880817	0.3973
C(9)	0.187882	0.360510	0.521156	0.6126
C(10)	0.016083	0.310602	0.051780	0.9596
C(11)	-0.310999	0.983934	-0.316078	0.7579
C(12)	-0.314807	0.767539	-0.410151	0.6896
C(13)	0.007515	0.436782	0.017206	0.9866
C(14)	-0.001463	0.138671	-0.010547	0.9918
C(15)	0.114172	0.173212	0.659148	0.5234
RESID(-1)	0.471440	0.312660	1.507836	0.1598
RESID(-2)	-0.763216	0.331792	-2.300285	0.0420

R-squared	0.383139	Mean dependent var	1.23E-16
Adjusted R-squared	-0.514114	S.D. dependent var	0.337433
S.E. of regression	0.415209	Akaike info criterion	1.359908
Sum squared resid	1.896386	Schwarz criterion	2.168747
Log likelihood	-2.038719	Hannan-Quinn criter.	1.607178
F-statistic	0.427013	Durbin-Watson stat	1.740639
Prob(F-statistic)	0.940578		