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ASSESSMENT OF THE INDUSTRIAL SECTOR POTENTIALS AND ECONOMIC GROWTH NEXUS IN NIGERIA

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Abstract

The study assessed the potentials of industrial sector in stimulating economic growth in Nigeria, through identifying the various raw materials, physical capital, and human capital necessary and available in the six (6) geo-political zones in Nigeria for the growth of the industrial sector. The study adopted the Co-integration and error correction model technique, the result showed that all the determinants of industrial development (foreign direct investment, labour, and electricity supply, bank credit to the industrial sector, exchange rate, and inflation rate) have significant effect on the performance of the industrial output. Both labour and electricity supply have significant impact, exchange rate showed a positive and significant impact indicating that currency appreciation might be inimical to the growth of the industrial sector. All variables where subjected to unit root test to test for stationarity. The study concluded that Nigeria should utilise its enormous amount of opportunities and resources (infrastructural, human and capital) to become an industrialised nation, while government need to make favourable policy to attract investors.

Keywords: Industrial Output, Gross Domestic Product

JEL Classification: L7; O4; O14

1. Introduction

History has shown that no country has ever become rich by just exporting raw materials without having a vibrant industrial sector to boost production, and an advanced service sector. The more a country specialises in the production of primary products (Raw materials) only, the poorer it becomes. Nigeria is endowed with a lot of natural and human resources in spite of the abundant natural resources Nigeria's incidence is still classified among the underdeveloped nations in the world. The best explanation for this has been seen in studies which showed that resources alone especially petroleum resources combined with inefficient institutions have a negative relationship with economic growth.

Nigeria has two broad vegetation types: forest and savannah. The Savannah, especially Guinea and Sudan, are the major grains, tubers, vegetable and cotton growing regions. While the tropical evergreen rain forest belts bears timber production, cultivation of cassava; and plantation growing of fruit trees-citrus, oil palm, cocoa, rubber, among others. Most of the crops produced are perishable and they need to be preserved and processed into finished goods by industries, the exportation of these products has the potential to generate more revenue for the economy, and boost economic growth; the afore mentioned, calls for the need to revamp the industrial sector of the economy. There is a need for the transformation of the Industrial Sector as all the industrial policies since independence, have only succeeded in making this indispensable sector contribute less than 5% of Nigeria's Gross domestic product (CBN, 2017).

Nigeria has articulated the sustainable development goal, which targets to advance Nigeria into the league of global economies and to be an industrial country by the year 2030. To achieve this, Nigeria should utilise its enormous amount of opportunities and resources (infrastructural, human and capital) to become an industrialised nation. The Economic explanatory variables necessary for the start-up of industries includes capital, human resources, physical resources and effective policy formulation and implementation necessary to stimulate industrialisation. However, despite all the arrays of policies that conform to different dispensations in the Nigerian economic growth, the contribution of industrialization or industries to Nigeria economic growth still appear to be far below expectation. For example, the share of the Nigeria industrial sector in the Nigeria's GDP fell from 13.18% in 2000 to 11.9% in 2001 it fell further to 10.93% in 2004, the falling trend still continues till date. In the Nigerian setting, these factors do not seem to be lacking (Sanusi, 2011).

Therefore, the nation needs to consider accessibility, cost, deployment and efficiency. It has to include the role of power (infrastructural resource) in industrial development since it plays a key role in the process of industrialisation.

Based on the foregoing, an empirical work that will critically identify and analyse the potentials of industrial output growth in Nigeria is crucial. Therefore, the general objective of this study is to investigate the industrial sector potentials in promoting export and economic growth in Nigeria by processing agricultural products, and natural resources. The specific objectives are to identify the various alternative sources of funds for industrial expansion. The major impediments hindering Nigeria industrial sector from developing includeslack or inadequate power supply to boost production and industrial activities, over dependence in the oil sector which is fast crippling the economy due to perennial fall in global oil price, lack of accessibility to capital for expansion, as most industries use obsolete technology for production. These challenges have made the industrial sector contribution to Nigeria's GDP decline from about20.37% in 2010 to 17.22% in 2013 (CBN 2017)

2. Literature Review

2.1 Empirical Literature

Gado (2012) employed the use of Pearson correlation technique to empirically analyse the transformation of the industrial sector as a key to economic growth in Nigeria covering a 30 years period from 1980- 2010 . The study used a simple association, two impacting variables, Foreign Direct Investment (FDI) and electricity supply and correlated them with two performance variables of contribution to GDP and manufacturing index. The findings showed that electrical supply has a robust positive relationship with the two performance measures in contributing to Gross Domestic Product (GDP) and manufacturing index, while the FDI had a conflicting relationship with that of theory. The study recommended that a complete overhaul of the electricity industry when combined with private public partnership and a revolutionary handling of corruption stimulate the inflow of FDI that will stimulate development in Nigeria. The study concluded that the growth of the Industrial Sector is measurable by looking at its contribution to national income and employment.

Otalu and Keji (2015) assessed the determinants of industrial sector growth in Nigeria, by adopting the co-integration and error correlation model of analysis. The results showed that all the identified determinants of industrial growth (capital, labour, exchange rate, education, inflation rate, capacity utilization, trade openness and electricity generation) have more of permanent effect on industrial output than transitory effect. Anthony, Chukwu and Wilfred (2015) analysed the impact of non-oil sector on economic growth in Nigeria from the period 1981 to 2012. The study adopted the export-led growth hypothesis framework and used the Johansson co-integration and vector error correction model for its empirical analysis. The result from the analysis showed that the non-oil export and economic growth had a positive relationship in the long run and in the short run. The study also adopted a Granger causality technique which revealed no causality relationship between the non-oil export and economic growth.

2.2 The Bank of Industry and Industrial Development

Access to financial capital for industrial expansion can be improved by sourcing for credit through the Nigerian Bank of Industry (Gaddi, 2004). The Bank of Industry (BOI) was set up to help boost the work of the industrial sector, especially those outside the mining sector of the economy. The BOI makes funds (loans) available to those that want to go into production business in the country and do not have the financial capability to venture into the production process. Bank of Industry was established in the year 2001 to stimulate the development of Small and Medium Scale Enterprise (SMEs) in line with the federal government industrial policy. BOI stimulate economic activities throughout the country by mobilizing local resources for entrepreneurship development and provide funds to revamp the indigenous industries, in other to generate employment with preference for enterprises with potentials to generate foreign exchange (Gaddi, 2004). .

The Bank of Industry has made a point of devoting 85% of the Bank's resources to SMEs. Generally it can be concluded that 100% of the Bank's resources are devoted to SMEs because the balance of 15% which is reserved for large enterprises finds its way to small enterprise as well because the bank insists that large enterprises that gets the loans must have linkages with small or medium enterprises (Oputu, 2008). The Bank of Industry since 2006 has been active in encouraging state governments to develop independent power projects in a bit to increase power supply for industrial production

2.2.1 Requirement for Sourcing for Funds from the Nigeria Bank of Industry

Access to loans from the Nigeria bank of industry, the business needs to meet the following criteria.

1. Formal letter of Application

2. Photocopy of Certificate of Registration or Incorporation
3. The Certified True Copies of Forms C02 and C07
4. A photocopy of the Certified True Copy of Memorandum and Articles of Association of the Company.
5. Feasibility Study Report (4 copies)
6. Quotations for items of equipment (at least 2 or 3 quotations from different sources), where applicable.
7. Three (3) years most recent Audited Accounts of the company (for existing company).
8. Organizational Structure and Management of the company.
9. Declaration of total outstanding liabilities of the company.
10. Statement of Account for the past six months from the company's bankers
11. Acceptable Securities shall include a charge/security interest over all of applicant's assets, copyrights, rights etc. and on the equipment/ assets financed and/or the under-listed securities among others:
    - Registered Intellectual Property/Proprietary Assets. Assignments of all agreements and Intellectual Property Rights (IPRs) to Bank of Industry (BOI). The Bank would have right in the negotiation of valuation of IPRs
    - Joint and Several Guarantees of the Directors of applicant Company with Statement of Net worth.
    - Provision of Guarantee cover issued by any financial institution acceptable to the bank.
    - Insurance cover from any acceptable/reputable insurance company for short term lending of not more than one year.
    - Marketable financial instruments.
    - Assignment of receivables/lien on proceeds/deposits and the right of set-off.
    - First hypothecation charge on all the tangible moveable assets under the project.
    - Ordinary producers would be required to bring in at least 25 per cent of the project cost as promoters' contribution.
    - Producers would be required to tie up the advances from the Distributors to cover 35 per cent to 40 per cent of the budget.
    - A Trust and Retention Account (TRA) may be maintained for all capital as well as revenue inflows and outflows. Thus receivables on sale of all IPRs would be credited to TRA. The modalities of TRA would be worked out on case-by-case basis to the satisfaction of the Bank, which will have first charge on the TRA.
    - Any other security that may be acceptable to the bank.
12. Three (3) years most recent Tax Clearance Certificate for the Company and two (2) Directors.
13. Eight recent Passport photographs of each of the two Directors and the Company Secretary.
14. Completed copy of Bank of Industry Questionnaire.

2.2. The Relationship between the Industrial Sector and other Sectors in Nigeria

The various sectors in Nigerian as defined by the Central Bank of Nigeria and the National Bureau of Statistics includes the agriculture sector, industrial sector, wholesale and retail trade sector, building and construction sector, and services sector. Although these sectors are all related to each other in one way or the other, however, the aim of this study is to identify the relationship between the industrial sector and the other sector in economic development.

2.2.1 Agricultural Sector and Industrialisation in Nigeria

The relationship between the agricultural sector and the industrial sector should not be viewed as a competitive one but rather as an interdependent relationship where supply and demand in sectors can be accommodated through a strengthened linkage (Odetola & Etumnu 2013).The Industrial sector is an important sector and any county that strives to attain economic development should work towards strengthening its industrialisation (Lewis, 1954). The position of the agricultural sector in promoting industrialisation cannot be neglected as the case has been in Nigeria. Development of the agricultural sector is a prerequisite for the development of the industrial sector through the provision of raw material for industrial production, increase in rural incomes, and provision of a domestic market for industry and ultimately the release of resources to support industry. The agricultural sector provides raw materials (fruits, crops, hides and skin, timber, wool etc.) for the production of finished goods (fruit juice, processed food, shoes, bags, leather, textile materials, furniture etc.) produced by industries.

Despising the agricultural sector in favour of the other sectors will only slow economic growth and cause income inequality. Although, the agricultural sector may not be able to single-handedly transform the economy, it remains a necessary and sufficient condition in kick starting industrialisation in the early stages of development. In Nigeria, because 70% of the population is employed in the agriculture sector, economic growth will be almost impossible to achieve without developing the sector (Odetola & Etumnu 2013).

2.3. Industrial Potentials of the Geopolitical zones in Nigeria

The industrial sub-sectors as defined by the Central Bank of Nigeria statistics (CBN 2017) includes:

1. Manufacturing industry
   - Oil refining industry; Cement industry; Fruit processing industry; Food processing industry; Other manufacturing industry
2. Crude petroleum and natural gas industry
3. Solid mineral industry
   - Coal mining industry; Metal ore industry; Quarrying and other mining industry

Table 1: Geopolitical Zones assessment of Nigeria Industrial Potentials

Geopolitical Zone	States	Agricultural Products	Natural Resources	Industrial Potentials
North Central (Middle Belt)	Benue, Kogi, Kwara, Nasarawa, Plateau, Federal capital Territory	Groundnut, Yam, Cassava, Citrus, Fruits, Rice, Soya-beans, Maize, Cashew Nuts, Cotton, Sea Foods	Mable, iron ore, lead, zinc, limestone, coal	Food processing industries (Soya oil, Vegetable oil Rice-Mill), Textile Industries, Fruit juice industries, Cement Industry, Mining Industry
North East	Adamawa, Bauchi, Borno, Gombe, Taraba, Yobe	Groundnut, Rice, Wheat, Tomatoes, Pepper,Soya-beans, Maize, Beans, Cowpea, Sugar Cane,	Tin, Columbite , Limestone, Iron ore	Food Processing Industry (Sugar factory, tomato paste factory, vegetable oil factory)
North West	Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, Zamfara	Cattle-Hide, Beef and Skin, Groundnuts, wheat, Beans, Cowpea, cotton,	Copper, Iron ore, Gold, Zinc, salt, limestone	Leather (Shoe and bag) Industries, Food processing industries, Mining industries,
South East	Abia, Anambra, Ebonyi, Enugu, Imo	Oil Palm, Cashew Nuts, Banana, Plantain	Limestone, zinc, crude oil and natural gas	Food processing industries, oil and gas industries, mining, cement industries
South-South	Akwa-Ibom, Cross River, Bayelsa, Rivers, Delta, Edo	Oil-Palm, Cocoa, Timber, Rubber, Cassava, Sea food, Banana, Plantian	Crude Oil and Natural Gas	Oil and gas Industry, Food processing industries, leather industry, plastic industries
South-West	Ekiti, Lagos, Ogun, Ondo, Osun, Oyo	Sea Food, Cocoa, Tobacco, Plantain, coffee, Citrus	Iron Ore, Granite, marble,	Paper Mill, food processing industries, Mining industries, fruit juice industries

Source: Authors computation

In terms of agricultural products and natural resources, Nigeria is one of the richest countries in Africa (Table 1) with known deposits of tin, columbite, tantalite, gold, lead-zinc, limestone, kaolin, clay, shale, marble, radio-active minerals, coal, lignite, petroleum, natural gas, food and cash crops (Adesopo & Asaju, 2004)). The excess of

these agricultural products need to be processed in industries, likewise the natural resources needs to be harnessed for manufacturing purpose. The right of a community to have a measure of control over its natural resources, the usage not only relates to crude oil but all natural resources. With the failure in government policies, individuals and group of investors can secure loans and establish industries to harness the untapped natural resources. Resource control is all about the demand by the states and local governments of Nigeria to have ability to convert these natural resources to wealth for the citizens. States and local governments can be allowed to control/ manage the revenue accruing from the oil and other natural resources in line with the tenets of true federalism. By this, each zone would have a full control of its resources and contribute an agreed percentage towards the maintenance of common services of the government at the centre as the case was in the first republic and as it is being practised in countries like Switzerland, Canada, France, and even United States of America where Nigeria copied her system of governance. Investors and cooperate bodies can source for loans from the Bank of Industry with licence from the government to harnessed these resources to set up industries in these geopolitical zones to achieve economic growth and development.

2.4. Challenges of the Industrial Sector in Nigeria

The industrial sector contributed about 27.36% in 2014,23.71% in 2015, 20% in 2016, and 22.56% in 2017 to the GDP of Nigeria, which is far less when compared to contemporary countries like Turkey, Singapore, China, India, and Indonesia (NBS 2017). China industrial sector contribute about 43. 3% in 2014, 41.1% in 2015, 40.1% in 2016 and 40.5% in 2017 to GDP (Indexmundi, 2018). The major challenges faced by Nigeria industrial sector includes among others:

Power supply

The role of electrical supply in industrialisation cannot be overemphasized. Adenikinju (2008) showed that firms spent over 2 billion naira in 1998 to provide their own electricity for production. Shortage in power supply had cause a significant reduction in the total output performance in production. According to Adenikinju (2008) 93.2% of correspondents ranked power supply as the major constraint to the success of their business. Gado and Nmadu (2011) showed a positive relationship between electricity supply and industrial output of textile industry in Nigeria. Gado and Nmadu (2011) concluded that the power sector needed an emergency if there must be an improvement in industrial performance in the country. Iarossi and Clarke (2011) in a World Bank study that covered 26 states in Nigeria revealed that 83% of all managers indentified electricity outages as serious hindrance to their businesses development above any other limitation.

Capital

Investment capital is another important factor in enhancing industrialisation and acceleration of economic growth in Nigeria. Capital fund is crucial for purchase of machineries, acquisition of modern technology that can be used to increase production output. Funds are also essentially needed to pay workers' salaries and allowances. Not only should these funds be available in sufficient quantity, those acquired through credit should have long enough payback period to allow the investment to begin to yield return (Gado 2012).Access to capital has been a major obstacle to industrialisation in Nigeria. A study on Nigeria investment climate involving 3000 business owners, the result showed that the biggest obstacle of business expansion is lack of capital (Iarossi & Clarke, 2011). It reported that about 60% of loan applications were rejected, not only that a higher percentage of about 89% of successful applications required collateral but most entrepreneurs could not provide such collateral.

Corruption

The corruption perception index ranked Nigeria among the highly corrupt countries in the world. This has discouraged investors and reduced the inflow of Foreign Direct Investment (FDI) into the country. Anti-corruption policies implemented in the country have been targeted on enforcement measures rather than addressing the root causes of corruption. (Chete, Adeoti, Adeyinka, & Ogundele 2014). The major causes of corruption in Nigeria have been identified to include over-centralisation of resources at the centre and social insecurity. Although law enforcement agents, suitable laws and viable institutions such as the Economic and Financial Crime Commission (EFCC) and Independent Corrupt Practices commission (ICPC), has been set up to fight against corruption in Nigeria, but their greatest challenge has been in formulating a strategic plan of action to deal with the root causes of corruption.

Insecurity

Insecurity in Nigeria has become a severe challenge in recent time, which includes internal conflicts, economic, religious, and ethnic crises all this have greatly affected investors' confidence in investing in certain parts of the country. This has also scared foreign investors from investing in Nigeria, there by slowing industrialisation and economic development. Although, insecurity of lives

and properties had become noticeable following the civil war and the subsequent military regimes which directly intensified urban violence, the recent upsurge of violence and insurgency in the country heightens the need to comprehensively address the persistent causes of social tension as a risk factor to Nigeria as an investment destination.

Infrastructure

Infrastructural development is critical in achieving industrialisation in any economy. The current infrastructural base in Nigeria, are grossly inadequate in terms of capacity and quality and is not capable of catering for the anticipated industrial development. Infrastructure can be described as the set of interconnected structural elements that provide framework supporting an entire structure of development. The term typically refers to the technical structures that support a society, such as roads, water supply, sewers, electrical national grids, telecommunications, and it is the physical components necessary for industrial development (Oyedele, 2012). Nigeria still has huge infrastructural deficits, particularly in the area of road and power generation. Lack of good road networks and the low current power generation capacity estimated to be less than 2000 megawatts which is about 20% of the estimated national demand. The key challenge faced by private investors is the lack of infrastructure in Nigeria and this has slowed industrial output to its barest minimum.

3. Research Methodology

This paper employs the use of macroeconomic variables such as inflation rates, exchange rates, foreign direct investment, as key determining variables of industrial output. The study further identifies the role of other factors such as trade openness, labour, electricity generation and bank credit on the development of industrial sector in Nigeria. The role of these variables in determining development of the industrial sector cannot be over emphasised.

3.1 Model Specification

In examining the impact of the above listed variables on the industrial sector output in Nigeria, the following model will be employed for empirical analysis.

$$INS_t = \beta_0 + \beta_1 FDI_t + \beta_2 BCI_t + \beta_3 REER_t + \beta_4 ES_t + \beta_5 IR_t$$

Representing the above equation in a log-linear form,

$$\log INS_t = \beta_0 + \beta_1 \log FDI_t + \beta_2 \log BCI_t + \beta_3 \log REER_t + \beta_4 \log ES_t + \beta_5 \log IR_t + U_t$$

Where

INS = Industrial Sector contribution to GDP

FDI= Foreign direct investment, net inflows (% of GDP)

BCI= Bank Credit to the Industrial Sector

REER = Real Effective Exchange Rate

ES = Electricity Power Supply

IR = inflation Rate

U = Error term

3.2. Data Source

Data for the study were obtained from the Central Bank of Nigeria (CBN) statistical bulletin, the National Bureau of Statistics and the World Bank Development Indicator. The data on the industrial Sector contribution to GDP are contained in section C (sheet C1.2) of the 2018CBN bulletin. Data on total labour force, inflation and real exchange rate were obtained from the World Bank Development Indicator, the data covered the period between 1980 to 2017.

4. Empirical Results and Discussion

4.1 Unit Root Test

Testing for the existence of unit roots is a necessary condition for a time series models and co-integration. Testing for the presence of unit roots in a model is equivalent to testing whether a stochastic process is a stationary or non-stationary, the presence of unit root shows that the time series under study is non-stationary while the absence of a unit root means that the stochastic

process is stationary (Otalu & Keji,2015). A good number of commonly used methods of testing for unit roots exist, which includes the DickeyFuller (DF), Augmented Dickey-Fuller (ADF) test and the Philip Peron (PP) test. The Augmented Dickey-Fuller (ADF) test is considered superior when compared to the Dickey-Fuller (DF) test because of its ability to tackle the problem of Autocorrelation. Therefore this study adopts the Augmented Dickey-Fuller and the Philip-Perron Unit Root Test.

H_0: Variable is non stationary or got Unit Root

H1: Variable is Stationary or does not have Unit Root

Table 2: Augmented Dickey Fuller (ADF) Unit Root Test

Variables	Test Statistics	ADF Critical Value at 5%	Order of integration
INS	-4.0145	-1.95	I(1)
FDI	-5.3065	-1.95	I(1)
ES	-5.7379	-1.61	I(1)
IR	-6.5659	-2.62	I(1)
REER	-3.6494	-2.01	I(1)
BCI	-5.0494	-1.61	I(1)

Source: Authors computation

The result of the unit root stationarity test shown in tables 1 was conducted using Augmented Dickey Fuller (ADF). The result of the ADF test revealed that the variables are not stationary at level, Therefore the entire series was subjected to further test at first differencing. It is evidence that all the variables achieved a stationary trend process after the first differencing for both the ADF tests. Hence, the null hypothesis of unit root could no longer be accepted for the variables at this level. This means that the series is regarded to be integrated of order (1) process.

4.2. Granger Causality Test

The granger causality test is applied to determine the nature of the causal relationship among the variables in the model; the study was further subjected to a granger causality test.

Table 3: Granger Causality Wald Test

Null hypothesis	X^2-square	Probability Value
LFDI does not granger cause LINS	3.233	0.019
LINS does not granger cause LFDI	3.5384	0.170
LES does not granger cause LINS	9.3614	0.009
LINS does not granger cause LES	0.69175	0.218
LIR does not granger cause LINS	2.9864	0.015
LINS does not granger cause LIR	1.8659	0.393
LREER does not granger cause LINS	4.4806	0.011
LINS does not granger cause LREER	9.0831	0.016
LBCI does not granger cause LINS	13.742	0.001
LINS does not granger cause LBCI	6.3585	0.142

Source: Authors Computation

The granger Causality test result showed that there is a Bidirectional causality between Industrial Sector contribution to GDP (LINS) and the independent variable Real Effective Exchange Rate (LREER). This implied that a change in INS can cause a change REER, likewise, a change in REER will cause a change in INS. While the result in table three showed that there is a unidirectional relationship that flows from LFDI, LES, LIR, LBCI to LINS because the probability variables are less than 5%. This implies that Foreign Direct Investment (LFDI), Electricity power supply (LES), Inflation Rate (LIR), Real Effective Exchange Rate (LREER) and Bank Credit to the Industrial Sector (LBCI) granger causes Industrial Sector contribution to GDP (INS), and a change in these variables will affect the dependent variable LINS, but a change in LINS cannot affect these variables. The result

showed that LINS do not granger cause LFDI, LES, LIR, LBCI because the probability variables are less than 5%. All the results are evident at 5 percent level of significance.

4.3. Johansen Co-integration test Results

The Johansen co-integration test is applied to test for the existence of a long-run relationship among the variables in the model. The justification for this test is based on the result of the Augmented Dickey Fuller unit root test which revealed that all variables in the model are integrated of order one and as such informs the choice of a Johansen co-integration test. Secondly, the Granger Causality Test result reported in Table 3confirmed a bidirectional causality running from the independent variables LINS to the dependent variable Real Effective Exchange Rate (LREER). However, the result of the test as indicated by the Trace Statistics and Maximum Eigenvalue reports two co-integrating equations each and as such points to the existence of a long-run relationship among the variables in the model. These results are shown in Tables 4 and 5.

Table 4 Co-integration rank test (Trace)

No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical value
None*	-	301.0944	94.15
At most 1*	0.98054	175.0375	68.52
At most 2*	0.90554	99.5324	47.21
At most 3*	0.75187	54.9304	29.68
At most 4	0.71262	15.0276	15.41

Trace test indicates 3 co-integrating equation(s) at the 0.05 level

Table 5 Co-integration rank test ((Maximum Eigenvalue)

No. of CE(s)	Eigenvalue	Max-Eigen Statistics	0.05 Critical value
None*	-	126.0569	39.37
At most 1*	0.98054	75.5050	33.46
At most 2*	0.90554	44.6021	27.07
At most 3*	0.75187	39.9028	20.97
At most 4*	0.71262	14.2357	14.07

Max-Eigenvalue test indicates 4 co-integrating equation(s) at the 0.05 level

The results from the Trace statistics test revealed that there are at most 3 co-integrating equations at 5% critical value. This means that the values of the trace statistics from this equation(s) are greater than the tabulated critical values. Therefore there is co-integration or a long run relationship among variables. Similarly, the Max-Eigenvalue statistics indicates 4 co-integrating equations, which implied that the variables in this model move together and are associated in the long run.

4.4. Vector Error Correction Model

The study employed the Vector error correction model (VECM) for estimating the model, the justification for using the VECM is because the variables are stationary at first difference I(1), and the result of the Johansens co-integration test for both trace statistics and the Max-Eigen-value test revealed that all variables are co-integrated and have a longrun relationship.

Table 5.Vector Error Correction Model Result

Dependent Variable: D(INS)

	Coefficient	**Std. Error**	**Z-Statistic**	**Prob.**
CE1	-0.1302433	0.1567677	-0.83	0.002
CE2	-0.00003	.000041	-0.72	0.004
CE3	-2.105844	3.435001	-0.61	0.006
INS(LD1)	0.0124152	0 .2542791	0.05	0.002
INS(LD2)	0.2969234	0.1405284	2.11	0.035

BCI(LD)	-0.0001945	0.0002321	-0.84	0.05
BCI(LD2)	.0002501	.0002216	1.13	0.029
ES(LD)	-0.8708306	3.239396	-0.27	0.007
ES(LD2)	-0.9473486	2.372122	-0.40	0.019
REER(LD)	1.667512	1.788201	0.93	0.005
REER(LD2)	-O.5174528	2.073315	-0.25	0.003
IR(LD)	7.969364	13.16256	0.61	0.061
IR(LD2)	15.69961	10.45748	1.50	0.033
FDI(LD)	-112.315	115.9461	-0.97	0.013
FDI(LD2)	-87.82355	67.62683	-1.30	

Source: Authors computation

5. Discussion of Result

The empirical Results obtained from the Vector Error Correction Model (VECM) and Granger causality models showed that the three error correction term (CE1, CE2, CE3) with the coefficient -0.1302433, - 0.00003, -2.105844 respectively are positively significant with probability values less that 5 %. This means that there is a long run causality running from Foreign Direct Investment (FDI), Bank Credit to the Industrial Sector (BCI), Real Effective Exchange Rate (REER), Electricity Power Supply (ES), and Inflation Rate (IR) to Industrial Sector contribution to GDP (INS). The results further revealed that the coefficient of electric power supply (ES) for the two lag period LD1 and LD2 which are -0.8708306 and -0.9473486are significant. The coefficient of Foreign Direct investment (FDI) for the two lag period LD1 and LD2 are -112.315 and -87.82355 are also significant.. This implied that electric power supply (ES) and Foreign Direct investment (FDI) cause major changes and have long run causality on Industrial Sector contribution to GDP (INS).This is shown by the positive impact on INS in all two lag periods. Real Effective Exchange Rate (REER) was found to exert changes on INS at the second year lag period with the error correction term -0.5174528, while Bank Credit to the Industrial Sector (BCI)-0.0001945 only exerted changes on INS at the first lag period. The results obtained in this study have some implications, indicating that the proportion of FDIs going to the industrial sector have a great effect on the potential growth of the sector and these translates into meaningful economic development in Nigeria. Similar, increase in power supply contributes greatly to the potential and growth of the industrial sector in Nigeria. The result showed that these two variables are the most effective instruments for stimulating the improvements in the performance of the industrial sector in Nigeria. Although, real effective exchange rate, Bank credit to the industrial sector and Interest Rate also affect the potentials of the industrial sector in Nigeria, as such changes in the exchange rates such as devaluation of the Naira will have serious impacts on the industrial sector.

6. Conclusions and Recommendations

The finding of this study showed that the industrial sector in Nigeria has the potentials to stimulate economic growth in Nigeria. Inflow of FDI greatly contributes to the growth of the industrial sector through the provision of needed capital and technology. The finding relating to electricity supply showed a robust positive relationship with the industrial sector and its contribution to GDP. Nigeria industrial sector suffer acute shortages of infrastructure such as power supply. Electricity outages and voltage fluctuations are commonplace, causing damage to machinery and equipment. Consequently, most firms rely on self-supply of electricity by using generators, which escalates their costs of production and erodes their competitiveness relative to foreign firms. Furthermore, improvements in the performance of the industrial sector were found to be necessary for the attraction of commercial bank credit to the sector. This is not surprising in view of the unwillingness of Nigerian banks to lend money to business men for start-up of new businesses.

Based on the findings from the result, the study recommends the following

1. Private and publicly owned industries should divert to the use of alternative renewable sources of energy like the solar photovoltaic (PV) system, as the country is endowed with abundant energy resources. This will enhance domestic production of goods and services by local industries in the country.

2. The Nigerian government needs a revolutionary an intelligent approach in tackling the current insecurity problem so as to create a conducive

environment that will attract foreign direct investors.

3. The development of the agricultural sector should be prioritized, as it has the potential of producing raw materials for industrial production. The government should empower individuals with the necessary funds, equipment's and technology to embark on large scale production.

4. Finally policy makers should encourage the creation of new industries in the various geo-political zones in the country, industries sited in each geo-political zone should be based on the natural resources and agricultural crop and livestock found in such region, this will potentially stimulate economic growth in the country

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