An Empirical Analysis of the Impact of Foreign Direct Investment and Industrial Sector Performance on Nigerian Economy

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Abstract

This research investigated the impact of foreign direct investment and industrial sector performance on Nigeria economy using time series annual data from 1981 – 2015. The study explores dynamics amongst the variables within the Vector Error Correction Model (VECM). The Augmented Dickey Fuller (ADF) and Philip Perron's (PP) test reveals that all variables contained a unit root and were integrated of order one I(1). The Johansen Cointegration test result reveals the presence of a long-run relationship between FDI, Industrial Sector Output and GDP. Furthermore, VECM estimate shows that FDI and industrial sector output had a slight significant positive impact on GDP.The study concludes that Nigeria is yet to fully reap the benefit of FDI since its contribution to GDP is still very low at the moment, whilst the contribution of the industrial sector in the country has not been vibrant enough to spur economic growth in Nigeria. The study therefore recommends among other things that social and economic infrastructure be improved as this will help lessen the burden of industrialist and eventually lower the cost of doing business and in turn attract FDI inflow into Nigeria.

Keywords: Industrial Sector, Dynamics, Cointegration, Inflow, Economy

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INTRODUCTION

Traditionally, industrialization is seen as a necessity for sustainable economic growth, but the reverse has been the case in Nigeria, as policies enacted towards achieving this dream appeared to have little or no significant effect on economic growth. The mainstay of the Nigerian economy for decades now have been earnings from crude oil, with the country's budget been prepared based on forecasted price per barrel of crude oil. It suffices to state that the oil and gas sector accounted for over 95% and about 85% of government revenue, while also contributing 14.8% & 13.8% to GDP in 2011 and 2012 respectively. In contrast, the industrial sector accounted for only 6% to GDP in 2011 (Chete, Adeoti, Adeyinka & Ogundele,). Meanwhile, Adejube (1980) in a reaction to the poor performance of the industrial sector stated that industrial policies, objectives and strategies were often subject to modifications, neglect or even total abandonment. He further adjudged that industrial policies were pursed on ad-hoc basis and in a most uncoordinated manner in Nigeria. As a result, such policies can never promote a holistic growth in the country's GDP.

Ashiedu (2002) Foreign Direct Investment (FDI) is on the increase at an extra ordinary speed in the 21st century. It is therefore on record that the USA, France, Netherlands and Britain are among the major countries that supply foreign capital to Nigeria and that the bulk of this capital goes into the oil sector (Oji-Okoro and Huang, 2012). Nigeria as the largest economy in Africa has attracted significant amount of FDI inflow in recent years. According to UNCTAD World Investment Report (2016), Nigeria saw its FDI inflow decline in 2015 by 27% to $3.4billion as the nation was hard hit by the global drop in oil price, against this backdrop she accounted for about 6% of FDI inflow to Africa and received approximately 31% of the sub-regional total, with the oil and gas sector alone receiving about 70% of the FDI inflow. This therefore clearly shows that FDI over the years domiciled mainly in the now gloomy oil sector in Nigeria, hence contributing to the underdevelopment of the industrial sector. This big question then comes to mind, do these FDIs really impact positively on economic growth in Nigeria? If yes, then sustainability is necessary.

Some stylized facts on Nigerian Economy

Bennett and Anyanwu (2015) observed that a country is said to be industrialized when at least one-quarter of its Gross Domestic Product (GDP) is produced in its industrial sector. An industrial sector that does not contribute at least one-quarter of the country's GDP is widely viewed as major challenge facing a country's economic growth. In spite of the enormous revenue gotten from the sale of crude oil, the World Bank Development Indicators (2016) has shown that majority of Nigerians live below poverty line, with over 80million or 64% of the population living on less than two dollars a day. Likewise, United Nations Human Development Index (2016) also ranks Nigeria 158 out of 188 countries, which is significant, decrease in its human development ranking of 153 in 2013; and World Bank Development Indicators (2012) have placed Nigeria within the 47 poorest countries of the world. The lingering issue of poverty and underdevelopment can be traced to corruption, gross mismanagement, underutilization of available resources and the overdependence on crude-oil revenue which has led to Nigeria been

a mono-economic nation, all these have eventually robbed off on the industrial sector which would have eventually opened opportunity for job creation and economic development.

As shown in Figure 1, the growth rate of the Nigeria industrial sector over the years has witnessed a series of ups and down. In 2001-2003, industrial growth rate witnesses a steady rise, but this was ephemeral, as it declined again in 2004, a steady decline was observed from 2010-2013. In 2015 the growth rate plummeted to an all-time low of -2.60. Despite several policies enacted by the government to ensure an extensive growth in the sector, why has the Nigerian Industrial sector growth rate remain very unstable over the years?

Figure 1: Industry Production Growth Rate for Nigeria, 2000-2015

Source: CIA World Fact Book

Furthermore, comparing Nigeria to Indonesia and Malaysia (which are developing/middle income countries) in terms of industry value added (% of GDP) from 1981 to 2015; Nigeria's industrial performance was the lowest. On the average, Malaysia recorded 42%; Indonesia attained 49% while Nigeria recorded 37%. From Figure 2, the growth of Nigeria's industrial sector value as a % of GDP fluctuated severely as compared to Indonesia and Malaysia which were relatively stable. The industrial sector of Nigeria value added (% of GDP) began to witness a steady decline from 2011 till 2015. Despite the peak moments the industrial sector attained in Nigeria in 1992, 1996 and 2000; these growth rates were relatively low compared to that of Indonesia and Malaysia as shown in Figure 2.

Figure 2: Industry Value added as (% of GDP) for Nigeria, Indonesia and Malaysia, 1981-2015
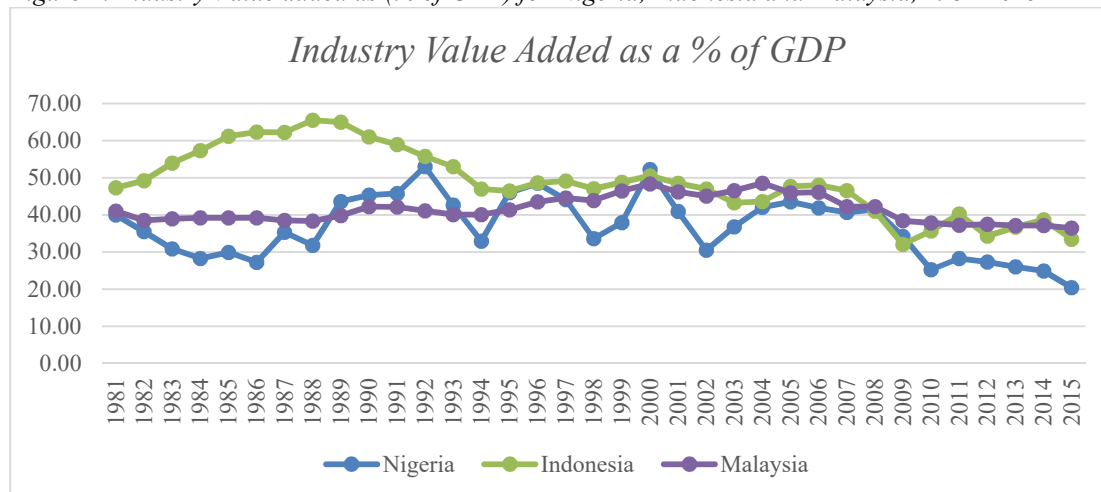
Source: World Bank Development Indicators

According to Makwembere (2014) despite the widely publicized theory linking FDI to economic growth, it is on record that FDI inflows have not really translated to growth in developing nations. With the substantial rise in FDI into Nigeria in years past, little or no impact has been seen on job creation, technology transfer and economic growth. According to UNCTAD World Investment Report (2016), majority of the foreign capital coming into Nigeria are mainly domiciled in the Oil and Gas Industry, with multinational corporations such as Shell, Chevron, Total and Exxon Mobil among those bringing a substantial sum of this FDI. This Oil and Gas sector domiciled FDI could be linked to the return on investment been higher, requiring advanced technical skills which is unavailable locally, creating a situation where much of the manpower is sourced abroad, thereby creating unemployment. If Nigeria is to reap more in terms of sustainable economic growth from the flow of FDI, measures

must be taken to channel foreign capital into other sectors of the economy such as the Industrial Sector by making such sectors attractive to potential investors while also putting other necessary infrastructure in place to enhance a smooth transition of foreign capital. Thus, the broad objective of this study is to empirically investigate the impact of foreign direct investment and industrial sector performance on Nigeria economy. The rest of the paper is thus, structured as follows. Section two provides the review of related literature, section three provides the methodology, section four deals on discussion of empirical results and findings, while section five concludes the paper and recommendations offered.

REVIEW OF RELATED LITERATURE
CONCEPTUAL FRAMEWORK
Foreign Direct Investment
Foreign direct investment essentially refers to direct investment equity flows in an economy .It is the sum total of equity capital, reinvestment of earnings and other capital flows to an economy

ECONOMIC GROWTH
Economic growth can be defined as the increase in value of goods and services produced in an economy over a given time period.
Economic literature is packed with extensive studies on the relationship existing betwen foreign direct Investment and economic growth. This stems as a result of its numerous advantages which includes accelerating long term economic growth, transfer of technology not available locally and technical skills in other to boost local manpower.

THEORITICAL FRAMEWORK
This study is based on the following theories**.**
THE ARROD-DOMAR GROWTH MODEL: The Harrod-Domar growth theory is based on the work by Harrod a British economist and Domar a Polish economist. Although their models were developed independently with significant differences in terms of details, but the assumptions and results are, nevertheless, basically the same. Their theories were based on the famous work by Keynes who offered an explanation of why markets may fail to bring about full employment. `Both models were concerned with determining the rate of income necessary for smooth uninterrupted working of the economy.

Harrod and Domar in their study assigned a key role to investment in the process of economic growth. But they laid emphasis on the dual character of investment. Firstly, it creates income and secondly it augments the productive capacity of the economy by increasing capital stock. The former maybe regarded as the "demand effect" and the latter as the "supply effect" of investment (Jhigan, 2010).

However, Harrod (1939) and Domar (1946) viewed development as a product of the real sector development. Their model is used to explain economic growth rate in terms of the level of savings and productivity of capital especially in economies with large and rapidly growing population. The principal strategy for development according to the Harrod–Domar model is mobilization of saving and generation of investment to accelerate economic growth. In this model, economic growth rate (g) is viewed as direct function of savings ratio (s) and an inverse function of the capital-output ratio (r). Thus $g = s/k$. (Ogbuabor, Orji, & Orji, 2015)

THE DOMAR MODEL
Domar (1946) clarified and supplemented the theory of John Keynes in his theory where investment is seen as a factor not only of income, but also a factor in the creation of production capacities. This represents the factor of development within production and supply of goods. Domar's theory determines the tempo at which investment should grow in order to ensure growth of revenue. This tempo is directly dependent on share of savings in national income (the marginal propensity to savings) and the average efficiency of investments.

In determining the rate at which investment should grow in other to make the increase in income equal to increase in productive capacity such that full employment is maintained, Domar's model forged a link between aggregate supply and aggregate demand through investment, arguing that the aggregate supply (net potential to increase output should be equal to aggregate demand if equilibrium is to be maintained.

Thus implying that in order to maintain full employment the economic growth rate of net autonomous investment must be equal to the marginal propensity to save multiplied by the productivity of capital.

THE HARROD MODEL
Roy Harrods's (1939) theory studied the growth trend of the economy. The model shows how steady growth may occur in the economy. It is based on the theory of the accelerator, which is allowed to determine the ratio of investment growth to growth in income. Roy Harrod's model is based on three rates namely; the actual growth rate, the warranted growth rate and the natural growth rate.

The "actual growth rate" in Harrod's theory is determined by the growth rates of labour and capital

productivity. The "warranted rate of growth" is also called the entrepreneurial equilibrium; it is the growth rate at which producers will be content with what they are doing, at the warranted growth demand is high enough to sustain production and business will continue to produce at the same percentage rate of growth. The warranted growth rate is determined by dividing savings by capital requirement needed to maintain the warranted growth rate.

At full employment, the actual growth rate must equal the warranted growth rate that would give steady advance of the economy. The natural growth rate is the rate of advancement which the increase in population, and technological improvements allow. Thus, during the analysis, Harrod arrived at conclusions similar to those obtained by Domar. Often their theories, as already noted, are combined into a single theory entitled "Harrod-Domar". It implies that, in the technical conditions of production, economic growth is determined by the marginal propensity to save, and the dynamic equilibrium in the market system is inherently unstable, so that maintaining it at full employment requires active and purposeful actions of the state.

SOLOW'S GROWTH MODEL
The Solow model expanded the Harrod-Domar Model that stressed the critical role of savings, investment & capital accumulation. It formalized & expanded the Harrod Model by adding labour, capital, and technology. Technology is assumed to explain the "residual" factor, which is assumed to be determined exogenously.

Solow shows in his model that with variable technical coefficient there would be a tendency for capital-labour ratio to adjust itself through time in the direction of equilibrium ratio. If the initial ratio of capital to labour is more, capital and output would grow more slowly than labour force and vice-versa (Jhingan 2010).

Solow (1957) proceeds from the assumption that a necessary condition for equilibrium of the economic system is the equality of aggregate demand and aggregate supply. In his theory, aggregate supply is determined on the basis of the production function of Cobb-Douglas, which expresses the functional dependence between production volumes on the one hand, and the factors used and their combinations, on the other. Solow's theory can reveal interconnections between three sources of economic growth - investments, workforce and technological progress.

This study is hinged on the Harrod-Domar model which stresses the importance of savings and investment as catalyst for economic growth, this is because banks are major facilitators of growth and investment within an economy, through the vital function intermediation banks are promote productivity, investment and savings within the economy.

EMPIRICAL REVIEW
Hussain and Haque (2016) in their study on foreign direct investment, trade and economic growth in Bangladesh using annual time series data from 1973-2004 within the VECM framework observed that FDI has a positive significant impact on economic growth.

Emmanuel (2016) employing the multiple regression technique examined the effect of foreign direct investment on economic growth in Nigeria, using annual time series data from 1981-2015 found that foreign direct investment has a positive and significant effect on gross domestic product.

Uwubanmwen and Ogiemudia (2016) examined the effect of foreign direct investment on economic growth in Nigeria using annual time series data covering the period 1979 to 2013. The data were analyzed using Error Correction Model. The results reveal that FDI has both immediate and time lag effect on Nigeria economy in the short run but has a non-significant negative effect on the Nigeria economy in the long run. Pulstova (2016) studied the effects of foreign direct investment and firm export on economic growth in Uzbekistan. The study covered the period 1990 – 2014 and descriptive method was adopted. He found that an increase in FDI may cause firms to increase their export of products.

Okafor, Ugochukwu and Chijindu (2016) investigated the relationship between foreign capital inflows and economic growth in Nigeria for the period of 1981-2014 using the Toda Yamamoto test of causality. Their findings revealed that a bi-directional causality runs from GDP to FDI as well as from FDI to GDP. Seng (2016) utilize panel data for 21 Asian countries and find that a 1% increase in FDI and export led to 0.334% and 1.438% in economic growth of Vietnam respectively in the long run.

Umaru, Gambo and Pate (2015) investigated the relationship between economic growth and foreign direct investment in Nigeria from 1981 - 2013 within the VECM (Vector Error Correction Model) framework, found a positive and significant relationship between economic growth and foreign direct investment. Agrawal (2015) examined the relationship between foreign direct investment (FDI) and economic growth in the five BRICS economies over the period 1989–2012 and found that foreign direct investment and economic growth are co-integrated at the panel level, indicating the presence of a long-term equilibrium relationship between them.

Osuji (2015) examined the relationship between foreign direct investment and economic growth in Nigeria from 1981-2013 using the Bounds testing approach and Autoregressive Distributed Lags (ARDL) model. His findings showed that in the short run, FDI has a small positive but insignificant effect on growth while in the long

run; it has a small negative and insignificant effect. Tang (2015) examined the foreign capital flow effects on the European Union (EU) economic growth during 1987–2012 and found that the higher foreign direct investment (FDI) and portfolio investment (FPI) triggered by the European Monetary Union (EMU) have not contributed to growth. The lack of the FDI effect is surprising as they bring enormous benefits.

Muntah, Khan, Haider and Ahmad (2015) studied the impact of foreign direct investment on economic growth of Pakistan covering the period 1995 to 2011, using the Ordinary Least Square Regression; they found that FDI impacts positively on economic growth of Pakistan. Uwazie, Igwemma and Nnabu (2015) studied the causal relationship between foreign direct investment and economic growth in Nigeria from 1970-2013. Using Granger causality, they found that foreign direct investment granger causes economic growth both in the short and long run in Nigeria.

Trinh and Nguyen (2015) using annual series data for the 1990-2013 and Johansen cointegration technique, finds that a 1% increase in FDI is associated with 0.24% increase in economic growth in Vietnam in the long run. Oladipo (2012) explored the FDI-growth nexus with a panel data set of 16 developing countries in Latin American and the Caribbean countries. The data is taken for the last three decades during which the countries implemented profound economic and financial reforms. Their research finds that FDI has a positive effect on economic growth in 13 out of 16 countries.

Anwar and Nguyen (2010) using panel data which covers 61 province of Vietnam over the period 1996-2005 conclude that the direct effect of FDI on Vietnam economic growth is positive but the indirect effect through the economy's absorptive capacity is found to be negative. Li and Liu (2005) using both single and simultaneous equations examine the endogenous relationship between FDI and economic growth in a sample of 84 countries over the period 1970-1999. They find that FDI has a positive effect on economic growth only from 1980 onwards. Before the 1980s, severe economic and social conditions in developing countries hinder FDI from contributing to economic growth.

Gangnes and Noy (2008) use sectorial data for FDI inflows in Vietnam and China to examine the sectorial impact of FDI on growth. Their results show that FDI has a statistically significant impact on economic growth operating directly and through labor productivity and the effect is different among economic sectors. Pham (2008) 2-VAR model indicates that the impact of export on Vietnam economic growth appears to be very small.

Mensah, Ofori-Abebrese and Pickson (2016) within the ARDL (Autoregressive Distributed Lag) framework ascertaining the relationship between industrial performance and macroeconomic factors in Ghana from 1980 - 2013. Their findings indicate a cointegrating relationship between industrial output and macroeconomic factors; they opined that the major macroeconomic factors affecting industrial performance in Ghana were lending rate, inflation, employment and government expenditure. Based on the findings, they recommend that the government of Ghana stabilize the macroeconomic environment in order to achieve industrial growth and development. Bennett, Anyanwu and Kalu (2015) investigated the effect of industrial development on the Nigeria's economic growth from 1973 - 2013 using OLS (Ordinary Least Square) regression they found that the influence of industrial output on economic growth is not statistically significant. They further recommend that the government and its agencies ensure political stability and also implement strategic policies that will create a fair playing ground for foreign investors which will also improve the establishment of industries especially the manufacturing industries to encourage industrialization of the Nigerian economy as this will facilitate the strengthening of economic growth.

Also, Eze and Ogiji (2013) adopted the error correction model to ascertain the impact of fiscal policies on the output of the manufacturing sector in Nigeria from 1990 - 2010. Their findings showed a negative significant relationship exists between government tax revenue and manufacturing sector output in Nigeria, while a significant positive relationship exist between Government expenditure and the output of the manufacturing sector in Nigeria. They further recommended that the government embark on expansionary fiscal policies because such policies have the propensity to accelerate manufacturing production in Nigeria.

Akpan, Riman, Duke and Mboto (2012), using the VECM model explored the long-run implications of industrial production and non-oil export on economic growth in Nigeria from 1970-2006, they found that a unidirectional causality runs from industrial sector output to economic growth. Their result further reveals that a 100 percent rise in industrial production in one lag period in the short run will lead to 76 % rise in non-oil export production and a 7% rise in GDP in the current period. According to Bolaky (2011), he opined that there is a positive correlation between the level of industrialization and per capita income for developing countries.

Chimobi (2010) while estimating the relationship between Economic growth, Investment and Export in Nigeria opined that industrial production has the ability to increase investment which will further lead to the production of more good and eventually result to growth in the domestic economy.

Enang (2010) employing the ARDL (Auto-regressive distributed Lag) bounds examined the nexus between industrialization, electricity supply and economic growth in Nigeria. He found bidirectional causality between GDP and electricity supply, however only a unidirectional relationship was observed between capital employed and GDP. The research finally confirmed that electricity supply, technology and capital employed were necessary for industrial and GDP growth in Nigeria.

Diaz-Bautista (2003) within the framework of Granger causality, found a bi-causal relationship between industrial growth and GNP. Their empirical findings further indicate that the industrial sector and overall economy are co-integrated and have a long run relationship in Mexico.

Uddin and Norman (2002) examine the pattern of long run relationship between exports earnings and industrial activities in Bangladesh. Their findings revealed the existence of a bi-directional causality between exports and industrial activities in Bangladesh. Thus, the authors therefore opined that a viable industrial sector was necessary to drive Bangladesh external trade.

Kemal, Din, Qadir, Femando and Colombage (2002) also found a positive association between export growth, industrial production and economic growth for India as well as other South Asian economies.

Likewise, Blomstrom, Lipsey & Zegan (1994) argued that industrialization through foreign investors can positively influence economic growth. They further opined that the contribution of industrialization to economic growth rate is dependent on the threshold level of income.

Olajide, Akinlabi, & Tijani (n.d) posits that there exists a higher marginal product of labour from the industrial sector than the agricultural sector in Nigeria and so the transferring of resources for the agricultural sector to the industrial sector raises total productivity in the economy.

METHODOLOGY
RESEARCH DESIGN
Research design stipulates the framework for finding solution to problems of study. This study performs a time series analysis, in order to examine the impact of FDI and industrial sector performance on Nigerian economy using secondary data. The study covers a period of thirty-four years (1981 – 2015) using the ex-post factor research design. The study adopted *Ex-post factor* design using historical information in studying existing phenomenon, with the intent of using the result to understand the current trend as regard the issue of study.

METHOD OF DATA COLLECTION
Raw values for Foreign Direct Investment (FDI) and Industrial Sector Growth Rate (IND) were extracted from Central Bank of Nigeria (CBN) statistical bulletin. . The aforementioned data set were applied to analyze their impact on Economic Growth in Nigeria proxied by GDP (Gross Domestic Product).

METHOD OF DATA ANALYSIS
Two major methods of data analysis were used, namely;

Descriptive Analysis: This involves the organization, summarization, and display of data. Descriptive statistics employed includes; mean, mode, standard deviation, skewness and kurtosis.

Quantitative Techniques: The study employed the Vector Error Correction (VECM) model to investigate the interaction among the variables adopted for the study. However, before the estimation of the VECM model, the properties of the variables were diagnosed for stationarity and long-run relationship. The Augmented Dickey Fuller (ADF) and Philips Perron (PP) unit root test was used to access the stationarity and order of integration.

The Johansen cointegration technique was employed to check for the existence of a long-run equilibrium relationship among the variables, since it has the advantages amongst others for allowing for more than one cointegration equation. Finally, all statistical estimation was done using E-Views software.

MODEL SPECIFICATION
The VECM model adopted for the study is specified below:

$$Y_{it} = r_o + \mathcal{E}_{r1} Y_{t-1} + \mathcal{E}$$

Where Y_{it} is a vector of three variables (RGDP, FDI and IND)

Where;

RGDP = Real Gross Domestic Product

FDI = Foreign Direct Investment

IND = Industrial Sector Output

$\mathcal{E}$ = Stochastic error term called shocks or impulses or innovations in the VECM

t = Current time

DISCUSSION OF RESULTS/ FINDINGS.
DESCRIPTIVE DATA ANALYSIS

Table 1

	RGDP	FDI	IND
Mean	32228.55	2.76E+09	2.487429
Median	22449.41	1.59E+09	1.67
Maximum	69023.93	8.84E+09	22.12
Minimum	13779.26	1.89E+08	-13.09
Std. Dev.	18191.76	2.65E+09	7.332296
Skewness	0.838396	1.009697	0.600551
Kurtosis	2.254749	2.705477	3.895755
Sum	1127999	9.67E+10	87.06
Sum Sq. Dev.	1.13E+10	2.38E+20	1827.927
Observations	36	36	36

Source: Author's Computation Using Eviews 9

From table 1, the descriptive statistics shows that the RGDP in Nigeria for the study period has a mean value of 32228.55 with the yearly rates fluctuating between a maximum of 69,023.93 and a minimum of 13,779.26. The skewness with a value of 0.838396 indicates that the distribution is positively skewed. While the kurtosis value of 2.3254749 shows that the distribution is platykurtic. Likewise the descriptive values of FDI (Foreign Direct Investment) and IND (Industrial Sector Performance) were all positively skewed with their respective kurtosis values depicting a platykurtic distribution.

DIAGNOSTIC TESTS.

Before estimating the Johansen cointegration and VECM test, the following diagnostic tests were conducted to make sure that the estimated results are reliable, namely: Unit root, Serial Correlation, Heteroskedasticity, Normality and Spurious Regression.

Unit Root.

Unit Root occurs as a result of trend in a time series, which occurs as result of the mean, variance and covariance not constant across different periods. This study tested for the stationarity of all variables used by applying two different unit root test namely; the Augmented Dickey Fuller and Phillips-Perron Test. According to table 3 below, all variables attained stationarity after first differencing; thereby indicating that all variables were integrated of order 1, i.e. I(1).

Table 2: Unit Root Test Results

Variables	ADF Test	Remarks	PP Test	Remarks
LogRGDP	-3.229346**	1(1)	-3.044705**	1(1)
LogFDI	-11.15135*	1(1)	-11.15135*	1(1)
LogIND	-7.071660*	1(1)	-9.792866*	1(1)

Critical Values of ADF Test:
1% level = -3.639407
5% level = -2.951125
10% level = -2.614300

Critical Values of PP Test:
1% level = -3.639407
5% level = -2.951125
10% level = -2.614300

*/**/***, indicates significance at 1%, 5% & 10% respectively.
Test includes Trend and Intercept
Source: Authors Computation Using Eviews 9

Serial Correlation.

This refers to the relationship between a given variable and itself over various time intervals. Table 4 below shows that the LM-Statistics at lag 1 with p-value of 0.4143 indicates the absence of serial correlation in the model since the p-values are greater than the critical value at 5% level of significance. Thus, we can conclude that there is absence of serial correlation in the model.

Table 3. VEC Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Sample: 1981 2016
Included observations: 35

Lags	LM-Stat	Prob
1	9.252094	0.4143

Source: Author's Computation Using Eviews 9

Heteroskedasticity.

Heteroskedasticity occurs when the residuals for a regression model do not have a constant variance. Table 4, below indicates that the VEC Residual Heteroskedasticity test with a chi-square value of 72.69945 and a p-value of 0.8057 confirms the absence of Heteroskedasticity in the model since its p-values are greater than the critical values at 5% level of significance.

Table 4. VEC Residual Heteroskedasticity Tests: No Cross Terms
(only levels and squares)
Sample: 1981 2016
Included observations: 32

Joint test:

Chi-sq	Df	Prob.
72.69945	84	0.8057

Source: Author's Computation Using Eviews 9

Normality.

Normality test is a statistical process used to determine if a sample or any group of data fits a standard normal distribution. The result of the Jarque-Bera normality test (0.842137) with a probability value of 0.656345 indicates that the model residuals are normally distributed.
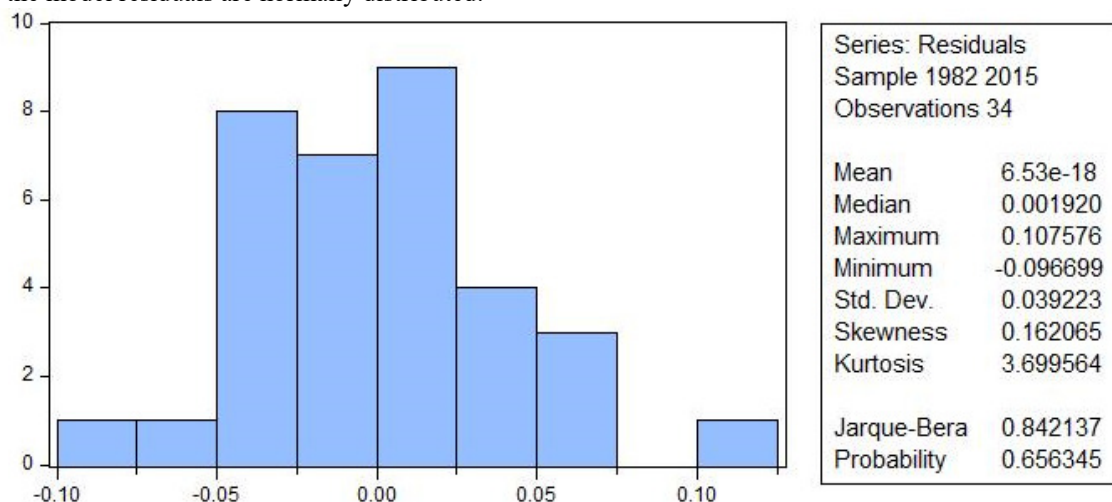

Series: Residuals	
Sample 1982 2015	
Observations 34	
Mean	6.53e-18
Median	0.001920
Maximum	0.107576
Minimum	-0.096699
Std. Dev.	0.039223
Skewness	0.162065
Kurtosis	3.699564
Jarque-Bera	0.842137
Probability	0.656345

Figure 1. Residual Normality Tests

Source: Author's Computation Uising Eviews 9

Spurious Regression.

As a rule of thumb, if the $R^2 >$ Durbin-Watson statistics, spurious regression is said to have occurred in the model. From table 5 below, the results confirmed the absence of spurious regression, since the value of R^2 (0.621758) is less than DW statistics of 2.273120.

Johansen Cointegration Test

Since all variables are stationary and integrated of the same order, i.e. I(1). The next step is to check for the existence of a long-run relationship among the variables. A co-integration test was performed using the Johansen co-integration technique to check for the existence of a long-run relationship. From Table 5 the Trace statistic and

Max-eigenvalue reveals 3 ranks respectively,
thereby leading us to reject the null hypothesis of no cointegration equation among the variable at 5 per cent. This therefore indicates that a long-run relationship exists between foreign direct investment, industrial sector performance and economic growth. This result allows for the estimation of the VECM (Vector Error Correction Model).

Table 5: Johansen Cointegration Test Results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.838430	81.16637	29.79707	0.0000	58.33022	29.79707	0.0000
At most 1 *	0.405243	22.83614	15.49471	0.0033	16.62726	15.49471	0.0033
At most 2 *	0.176365	6.208885	3.841466	0.0127	6.208885	3.841466	0.0127

Source: Author's Computation Using Eviews 9.

Vector Error Correction Model

Given the fact that the variables are cointegrated, the next step is to estimate the short-run dynamics within a vector error correction model (VECM). The coefficient of the lagged error correction term (ECM_{t-1}) as   expected have the negative sign and is statistically significant at 1% with economic growth . The ECM captures the speed of adjustment to restore equilibrium in case of any shock to any of the exogenous variables. The coefficient of the error term, -0.036672 which is significant at 1% level, indicates that about 3.66% of disequilibrium from previous year's shock in GDP converges back to the long-run equilibrium within the current year. This however suggests a very low speed of adjustment in the model.

The adjusted R^2 of 0.567724 shows a fairly good fit, indicating that about 56.77% of changes in the endogenous variable (RGDP) are explained by the cumulative effects of the exogenous variables. While the standard error of 0.027023 suggests that about 2.70% of the variation in the endogenous variable will not be explained by the exogenous variables. Furthermore, the F statistics of 11.50664 indicates that the model significant at 1% level and is a good fit.

Table 6: Overparametized VECM Results
Dependent Variable: D(RGDP)

	Coefficient	Std. Error	t-Statistic	Prob.
RGDP(-1)	0.068408	0.011592	5.901071	0.0000
FDI(-1)	0.073507	0.139990	3.311004	0.0026
IND(-1)	0.010734	0.004801	2.235913	0.0335
C	0.005895	0.004756	1.239665	0.2254
ECM(-1)	-0.036672	0.007813	-4.693542	0.0001

R-squared	0.621758	Mean dependent var	0.001904
Adjusted R-squared	0.567724	S.D. dependent var	0.041101
S.E. of regression	0.027023	Akaike info criterion	-4.245548
Sum squared resid	0.020446	Schwarz criterion	-4.018805
Log likelihood	75.05155	Hannan-Quinn criter.	-4.169256
F-statistic	11.50669	Durbin-Watson stat	2.273120
Prob(F-statistic)	0.000012		

Source: Author's computation using Eviews 9.5

SUMMARY, CONCLUSION AND RECOMMENDATIONS.
SUMMARY
The prima facie purpose of this research was to access the impact of foreign direct investment and industrial sector performance on economic growth in Nigeria using time series data from 1981-2016 modeled within the VECM (Vector Error Correction Model). The unit root test showed that foreign direct investment (FDI), industrial sector output (IND) and economic growth (GDP) attained stationarity after first difference. This result further supports the presence of long run relationship among the variables with evidence of co-integrating variables as depicted by the Johansen cointegration test. Furthermore, both explanatory variables (foreign direct investment and industrial sector performance) were found to be positively significant with economic growth.

CONCLUSION

This research examined the impact of foreign direct investment and industrial sector performance on economic growth in Nigeria.Results from the findings shows that a positive and significant relationship runs from foreign direct investment, industrial sector performance to economic growth in Nigeria. The VECM estimates reveal that FDI had a positive impact of about 7.3% on the economy; this shows that Nigeria is yet to fully reap the benefits of FDI, as its impact on economic growth at the moment is still very little. While the coefficient of industrial sector output was found to be positive, with about 1.1% impact on GDP. This result give credence to the fact that the industrial sector in the country has not be vibrant enough to spur economic growth.

In view of the above, our findings are consistence with the studies of Hussain and Haque(2016); Emmanual (2016) respectively, as the results indicate that FDI had a positive and significance relationship with economic growth.

RECOMMENDATIONS

Based on the findings that growth in FDI and industrial sector performance will significantly lead to an upsurge in economic growth, the following recommendations have been made;

1) The security level in the country should be tightened in order to encourage foreign investors' confidence, as instability anywhere in the country will scare away prospective investors.

2) Policies should be enacted and strengthened by government to limit the repatriation of profits by foreign firms and ensure reinvestment of profit in the Nigerian economy.

3) Proper management of existing industries is encouraged in other to enhance a positive impact on the economy.

4) The electricity situation in the country needed be improved upon as it remains one of the biggest obstacle hindering the industrial sector growth and development.

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