

Determinants of Foreign Direct Investment in Nigeria: A Structural VAR Approach

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ABSTRACT: Foreign direct investment is considered one of the ways through which a nation's economy could grow. As much as it associated with capital flight, foreign direct investment is also associated with transfer of technology and exchange of ideas that could trigger economic development. Nigeria as a country has benefitted immensely from the flows of FDI and the sustenance of which is very paramount to the economic growth and development. This study therefore examines the determinants of FDI in Nigeria. This, with a view of identifying the macroeconomic variables that influence FDI in the country. The study employs the use of Structural Vector Autoregression (SVAR) in analyzing the determinants of FDI in Nigeria. The unit root tested conducted showed that all the variables were non stationary, but were made stationary after first differencing. The coefficients of the explanatory variables showed that of all the variables considered namely; inflation rate (INF), exchange rate (EXR), degree of openness (DOP), infrastructure (INFRA) and growth rate of GDP (RGDP), only infrastructure was found to be negatively related to FDI. Both the SVAR estimates and the impulse response function confirmed this position. The Variance decomposition confirmed inflation rate and exchange rate as the most significant variables that determine FDI in Nigeria. It was recommended among others that social amenities like good road, electricity, Information and communication technology should be improved upon to have an improved FDI.

Keywords: Foreign Direct Investment, Structural VAR and Economic growth

JEL Codes: C51, E22 and F21

1. Introduction

In this era of globalization, the world is becoming a single entity as virtually all human endeavours are almost done in unison. From sport, social interaction, receiving health care across borders, transfer of technology, schooling abroad and exchange of ideas on transformation of a nation's economy, the world indeed is now a global village. Of the many fall outs of the globalization exercise is the foreign direct investment. Foreign direct investment (FDI) has grown strongly as a major form of international capital transfer over the past decades. It is considered a key element for a country's economic integration and represents a key source to finance capital investment. (Dellis, Sondermann and Vansteenkisle, 2017).

According to Asiedu (2002), foreign direct investment (FDI) is an investment in the form of a controlling ownership in a business in one country by an entity based in another country. It is thus distinguished from a foreign portfolio investment by a notion of direct control. It is an investment made by a firm or individual in one country into business interests located in another country. Generally, FDI takes place when an investor establishes foreign business operations or acquires foreign business assets, including establishing ownership or controlling interest in a foreign company. Foreign direct investments are distinguished from portfolio investments in which an investor merely purchases equities of foreign-based companies. Foreign direct investments are commonly made in open economies that offer a skilled workforce and above-average growth prospects for the investor, as opposed to tightly regulated economies. Foreign direct investment frequently involves more than just a capital investment. It may include provisions of management or technology as well. The key feature of foreign direct investment is that it establishes either effective control of, or at least substantial influence over, the decision-making of a foreign business.

The importance of FDI to national development. It is an engine of economic growth. As a subset of one of the major components of aggregate demand, FDI involves the questions of capital flight into a particular country. Such capital inflow all things being equal often lead to increase in money supply. The increased money supply is associated with expansion in national output, increase in employment opportunities and a favourable balance of payment. Given this background, suffice to say that one cannot over-emphasised the importance of FDI.

Given the perceived merits and advantages of FDI as enumerated above, there seems to be a disconnect between FDI and economic development in Nigeria. Many are of the opinion that the multinationals operating in the country are just ripping off the citizenry with reckless abandon. That the business environments are not properly regulated to take into consideration the interest of the masses. The questions that then follow are; given the plethora of all the factors mentioned above, what are the major determinants of FDI in Nigeria? How has the FDI affected economic growth and development in the country? What are the magnitude and signs of the determinants of FDI vis-à-vis FDI itself? How can these determinants be influenced to achieve a positive effect on the nation's economy? These and other unfolding research questions form the basis for the research study.

The broad objective of the study therefore is to examine the determinants of foreign direct investment in Nigeria. Specifically, the study will investigate the relationship between the determinants of foreign direct investment and FDI.

2. Literature Survey

Investment studies have generated a lot of controversies in economic literature. Most of the discussion centres on what constitute investment, significant of investment in any given economy as well as determinants of investment. The literature so examined here have been streamlined to discuss the determinants of foreign direct investment.

According to Blonigen and Piger (2011), the study examined previous studies on bilateral foreign direct investment (FDI) activity. The study exposes that there were substantial differences in specifications with little agreement on the set of covariates that are (or should be) included in most of the studies. As a deviation from the various techniques previously adopted, the study made use

of Bayesian statistical techniques that allow one to select from a large set of candidates those variables most likely to be determinants of FDI activity. The study concluded that variables with consistently high inclusion probabilities are traditional gravity variables, cultural distance factors, parent-country per capita GDP, relative labor endowments, and regional trade agreements. Variables with little support for inclusion are multilateral trade openness, host country business costs, host-country infrastructure (including credit markets), and host-country institutions. Of particular note, is that the results suggest that many covariates found significant by previous studies are not robust.

The study conducted by Narayan (2014) was on the determinants of foreign direct investment in India. The study first examines the theories of FDI and explain why firms undertake foreign investment rather than export to overseas markets. The study confirmed that the determinants of FDI can be grouped under two categories (i) economic conditions and (ii) host country policies. The paper then zero its analyses on the the determinants of FDI inflows in India. The study discussed the changes in the various determinants of FDI over the period 2012-13. Using correlation matrix and multiple regression analysis, the relationship between FDI determinants and FDI inflows was analysed. As the variables have higher degree of correlation leading to problem of multicollinearity, step wise regression was performed to understand the individual and combined impact of various factors. The study concluded among others that the size of GDP and rate of growth of GDP are important for attracting higher inflows of FDI. Higher FOREX reserves also helped India in attracting FDI inflows. The study then offer policy advice that India government should focus on maintaining higher forex reserves and accelerating rate of growth for attracting higher FDI inflow.

The objective of Mattila (2015) is to contribute to the understanding of FDI decisions through an in-depth analysis of location-specific determinants. More explicitly, the aim was to identify and evaluate the most significant variables associated with FDI in Sweden. The main conclusions reached in the study were that resource seeking and market seeking are one of the determinants of foreign direct investment in Sweden. Other noticeable factor was the policy affecting corporate and income taxes and the labour market. Government incentives on investment promotion were equally left out. However the study concluded that that the most significant factors that aided foreign direct investment were economic growth accompanied by the availability of skilled labours.

The central concern of Dellis, Sondermann and Vansteenkisle (2017) was the investigation of the determinants of FDI into advanced countries especially the euro area. The paper as a deviation from other literature makes the advanced countries its priority rather the usual FDI and the developing economies. This paper attempts to provide a deeper understanding on the measures and factors which could encourage capital transfers into advanced economies and the euro area specifically with a particular focus on the role of structural and institutional features. In addition to focusing on institutions the paper also explore a newly available FDI methodology which is able to clean as much as possible the FDI data of statistical artefacts such as financial round tripping. The results suggest that well-functioning economic structures are indeed a relevant determinant of FDI inflows in advanced countries, thereby suggesting that policies to attract FDI should also focus on improving these countries' economic structures. Moreover, the study also confirm earlier findings of the literature, namely the importance of other determinants of FDI inflows, such as labour costs, the size of the target market (as proxied by its economic activity), the trade openness

of the recipient country as well its tendency to tax economic actors. Comparing the empirical results using new FDI data, cleaned of statistical artefacts, such as financial round tripping, with those using series that do not correct for such artefacts, it was found out that results indeed differ somewhat, but remain overall robust.

In their contribution to economic literature on FDI, Offiong and Atsu (2014) examines the determinants of Foreign Direct Investment (FDI) in Nigeria during 1980 – 2011. The study aimed at determining functional relationships that exist between GDP, wage rate, interest rate and relative openness index, and the extent to which each variable has influenced FDI inflow to Nigeria. The paper contributes to existing studies by using the multiple regression analysis in testing whether the set of independent variables explained the dependent variable. The study found that a significant relationship existed between GDP and inflow of FDI as well as real wage rates and inflow of FDI. It also found no significant relationship between FDI in flow and the relative openness index as well as lending rate and FDI inflow in the years under review. Based on the findings, it was concluded that Nigeria being a latecomer to the quest for FDI, campaigns for inward flow of FDI have not yielded the desired result. Specifically, it was found that improvement in GDP would lead to an improvement in inflow of FDI. Per capita income is too low to effectively draw FDI into sectors that will generate positive externalities. When the wage rates increase in Nigeria, it will have a positive impact on the FDI inflow. To address the problem, it was recommended that; government must follow through with the reform programmes and pursue policies that will increase the GDP and income per capita, address the issue of poor wage rates, review trade and investment policies as well as customs and banking regulations.

In a similar study conducted by Ebiringa and Emeh (2013), the paper examines determinants of foreign direct investment (FDI) inflows using Nigeria as a case study, with specific attention on exchange rate, gross domestic product (GDP), inflation, stock market capitalization and interest rate. The study is motivated by the need to promote policies that attracts foreign capital for sustainable economic growth. Unit root test, Co-integration test, Variance decomposition and Error Correction Model (ECM) constituted the analytical methods. Results obtained shows that all the selected determinants individually and jointly exerted significant long run effects on FDI inflows. The recommendation therefore is that concerted efforts must be made to strengthen the capacity of economic planning and management institutions in order to ensure stability in macroeconomic performance, which boosts the confidence of foreign investors in the Nigeria.

In apparent extension of the work on FDI beyond the shore of an individual country, Anyawu (2011) extended the work of FDI to some sub-Saharan African countries. The aim of the study was to determine the major factors that are accountable for FDI into Africa. The central concern of the paper was to respond to the question: what determines FDI inflows to Africa? The motivation for carrying out the study was to understand the factors that will assist African policymakers to formulate and execute policies for attracting FDI. The study's estimation results from a panel of seven five-year non-overlapping windows for the period 1980-2007 indicate that: (i) there is a positive relationship between market size and FDI inflows; (ii) openness to trade has a positive impact on FDI flows; (iii) higher financial development has negative effect on FDI inflows; (iv) high government consumption expenditure attracts FDI inflows to Africa; (v) higher FDI goes where international remittances also goes in Africa; (vi) agglomeration has a strong positive impact on FDI inflows to Africa; (vii) natural resource endowment and exploitation (especially for oil)

attracts huge FDI into Africa; (viii) East and Southern African sub-regions appear positively disposed to obtain higher levels of inward FDI.

A major distinguishing feature of Akinlo (2017) is in the methodology adopted in examining the determinants of foreign direct investments in Nigeria. According to the paper, several studies have analyzed the movement of foreign direct investment in Nigeria using linear approach. In contrast with all existing studies in Nigeria, this paper runs several non-linear FDI equations where the main determinants of FDI are determined using Markov- Regime Switching Model (MSMs). The approach allows for observation of structural changes, where exist, in FDI equations through time. Asides, where FDI regression equation is truly nonlinear, MSMs fit data better than the linear models. The paper adopts maximum likelihood methodology of Markov-Regime Model (MSM) to identify possible structural changes in level and/or trends and possible changes in parameters of independent variables through the transition probabilities. The results show that FDI process in Nigeria is governed by two different regimes and a shift from one regime to another regime depends on transition probabilities. The results show that the main determinants of FDI are GDP growth, macro instability, financial development, exchange rate, inflation and discount rate. This implies liberalization that stems inflation and enhance the value of domestic currency will attract more FDI into the country.

Cuyvers et al (2008) examined the factors that might affect the inflows of FDI into Cambodia's small open economy over the period 1995-2005. Panel data sets were used for both approved and realized FDI. The data from seventeen home countries for approved FDI and fifteen home countries for realized FDI were pooled over 1995-2005. Even though some countries are not included, these panel data sets for the approved and realized FDI represent almost all (about 99 percent) of Cambodia's total FDI inflows during this period. The major difference between the above findings and a number of previous empirical studies on other countries resides in the use of explanatory variables in relative terms and in the application of several diagnostic tests for choosing the best econometric estimation technique. The use of relative values rather than level values stems from the belief that investors are rational in choosing and implementing FDI in host countries in which they set up affiliates, and are comparing both countries in terms of economic, political and institutional factors. Another important feature of this paper is that unit root tests were conducted for all time-variant variables to avoid spurious regression results. Random effects estimation proved to be the most suitable model for estimating approved FDI, while a pooled OLS model performed statistically better for the estimations of realized FDI. Levels and one-year lagged explanatory variables were used to estimate their impact on FDI inflows.

The results show that the determinants of approved FDI and realized FDI are consistently similar, but not identical. The FDI home country's GDP growth rate, its bilateral trade with the host country, and the exchange rate have a positive impact on inward FDI flows into Cambodia. The magnitudes of the economic significance of the estimates are, on average, larger for both approved and realized FDI with one-year lagged explanatory variables, which implies that it takes some time for investors to launch their FDI in an unfamiliar environment abroad, i.e. taking into consideration the conditions under which they planned and finally implemented their investment initiatives. Geographic distance negatively affects the level of FDI inflows in Cambodia.

The study then suggested among other things that, a further liberalization of Cambodia's international trade will attract more inward FDI, which in turn is expected to generate some positive externalities in the economy. As the home country rates of economic growth are a main

driving force of inward FDI flows into Cambodia, it follows that the country's ability to attract inward FDI is, to some extent, beyond its control and depends on the growth of the world economy and specific home countries. Thus, the Cambodian Government should devote much more effort in creating "pull factors" for the country, e.g., by improving its institutions, infrastructures and legal systems, by the removal of administrative barriers, etc., which can result in dynamic positive effects of inward FDI and economic growth, in addition to stimulating technology transfer to the country.

Walsh and Yu (2010) was an attempt determining the factors that aid foreign direct investment in twenty seven advanced countries. Using a dataset which breaks down FDI flows into primary, secondary and tertiary sector investments and a GMM dynamic approach to address concerns about endogeneity, the paper analyzes various macroeconomic, developmental, and institutional/qualitative determinants of FDI in a sample of emerging market and developed economies. While FDI flows into the primary sector show little dependence on any of these variables, secondary and tertiary sector investments are affected in different ways by countries' income levels and exchange rate valuation, as well as development indicators such as financial depth and school enrollment, and institutional factors such as judicial independence and labor market flexibility. Finally, the study found out that the effect of these factors often differs between advanced and emerging economies.

Kolstad and Villanger (2008) uses industry level foreign direct investment (FDI) data from 57 countries 1989–2000, to examine the host country determinants of FDI flows in services as a whole, and in the major service industries. From the study, institutional quality and democracy appear more important for FDI in services than general investment risk or political stability. Democracy influences FDI to developing countries only, suggesting that the absence of democracy is detrimental to investment below a certain threshold. Consistent with the observation that many services are non-tradable, the study found that service FDI is market-seeking, and unaffected by trade openness. A strong correlation between FDI in manufacturing and FDI in producers' services such as finance and transport was equally found out.

In a recent study on determinants of FDI in China and ASEAN, Gopalan, Rajan and Duong (2019), foreign direct investment (FDI) inflows remain an important source of external financing for several countries in the Asian region including China and the Association of South East Asian Nations (ASEAN) bloc of economies. The study was particular about Greenfield FDI inflows and how they have facilitated the development of regional production networks and manufacturing supply chains in Asia. The objective of the study was to investigate the importance of infrastructure in determining Greenfields FDI inflows into China and ASEAN economies. Using a panel data for the region economies, the study found out that roads emerge as the most robust determinant of Greenfield FDI inflows to China and ASEAN countries.

The concern of Uddin, Chowdhury, Shafique and Liu (2019) was on the institutional determinants of FDI in Pakistan. The study was born out of the inadequacy and inconsistent in the findings of existing literature on the subject matter. Using econometric technique, the paper found that certain institutional determinants such as size of the government, legal structure and strong property rights, freedom to trade and civil liberty have strong positive effect on FDI inflows. Among the institutional variables, regulation has been found to be most important to influence inward FDI flow to Pakistan. The paper has also found evidence that there was a structural break in FDI flows

in Pakistan which coincides with market liberalization programme in early 1990s. This confirms the effectiveness of conducive institutional environment to attract foreign investment. Moreover, the study found that military government is more successful in attracting FDI compared to democratic government in Pakistan.

3. Theoretical Framework and Methodology

So many models have been specified in economic literature for the purpose of estimating the determinants of foreign direct investments. This study however adopted the model specified by Anyawu (2011) where the determinants of foreign direct investments were specified as follows:

$$FDI_{ijt} = (UrbanPop_{ijt}, GDPP_{ijt}, Openness_{ijt}, Financialdev_{ijt}, Inflation_{ijt}, ExchangeRate_{ijt}, Infrastructure_{ijt}, Govconexp_{ijt}, Remittances_{ijt}, PoliticalRights_{ijt}, (FDI_{-1})_{ijt}, oil exporters_{ijt}, Region_{ijt}) \quad (1)$$

where i and j denote countries, t denotes time, and the variables are defined as:

FDI _{ij}	=	the net FDI inflows as % of GDP,
UrbanPop	=	the urban population as a percentage of total population,
GDPPC	=	gross domestic product per capita (US\$),
Openness	=	openness index - total trade (% of GDP),
Financialdev	=	financial development (domestic credit to the private sector as % of GDP),
Inflation	=	the annual inflation rate,
ExchangeRate	=	the official exchange rate to the US\$ (annual average),
Infrastructure	=	fixed and mobile subscribers (per 1000 people),
Govconexp	=	government consumption expenditure 9% of GDP),
Remittances	=	international remittances (% of GDP),
Political Rights	=	index of political rights (1=free, 7=repression),
FDI ₋₁	=	first lag of FDI,
Oilexporters	=	dummy for net oil exporters,
Regions	=	a binary variable representing the various regions of Africa (Central Africa, East Africa, North Africa, Southern Africa, and West Africa),

The above model was modified for simplicity and availability of data as follows:

$$FDI = f(RGDP, INF, EXR, DOP, INFRA) \quad (2)$$

where

FDI	=	Foreign Direct Investment into the country
RGDP	=	Growth rate of GDP
INF	=	Inflation Rate
EXR	=	Exchange Rate
DOP	=	Degree of Openness
INFRA	=	Infrastructure

When expressed linearly, the model becomes:

$$FDI = \alpha_0 + \alpha_1 GDP + \alpha_2 INF + \alpha_3 EXR + \alpha_4 DOP + \alpha_5 INFRA + U_t \quad (3)$$

Where the variables are as previously defined and α_0 --- α_5 are the estimated parameters. A priori expectation is that $\alpha_1 > 0$, $\alpha_2 > 0$, $\alpha_3 > 0$, $\alpha_4 > 0$ and $\alpha_5 > 0$.

4. Data Sources and Empirical Results

4.1. Data Sources

The data for the study are purely secondary and are sourced from texts, journals, publications of organizations and periodicals. The data for this study are sourced mainly from the Central Bank of Nigeria Statistical Bulletin (various editions) and from the online database of indexmundi.

4.2. Empirical Results

In terms of estimation procedure, despite the superfluity of methodologies so far use in analysing foreign direct investment, this study has adopted the methodology of Structural Vector Autoregression (SVAR). The SVAR model has proven to be especially useful for describing the dynamic behaviour of economic and financial time series and for forecasting. It often provides superior forecasts to those from univariate time series models. Following the Cholesky ordering and based on economic theory; equation 3 can be represented as follows:

$$FDI = f(INF, EXR, DOP, INFRA, RGDP) \quad (4)$$

Taking a cue from the Structural VAR equations above, $n(\frac{n+1}{2}) = 6(\frac{6+1}{2}) = 21$ restrictions on the

model, and hence, $6^2 - 21 = 15$ more restrictions are required to identify the structural matrix B

$$\tilde{Y} = \begin{bmatrix} b_{11}FDI & +b_{12}INF & +b_{13}EXR & +b_{14}DOP & +b_{15}INFRA & +b_{16}RGDP \\ b_{21}FDI & +b_{22}INF & +b_{23}EXR & +b_{24}DOP & +b_{25}INFRA & +b_{26}RGDP \\ b_{31}FDI & +b_{32}INF & +b_{33}EXR & +b_{34}DOP & +b_{35}INFRA & +b_{36}RGDP \\ b_{41}FDI & +b_{42}INF & +b_{43}EXR & +b_{44}DOP & +b_{45}INFRA & +b_{46}RGDP \\ b_{51}FDI & +b_{52}INF & +b_{53}EXR & +b_{54}DOP & +b_{55}INFRA & +b_{56}RGDP \\ b_{61}FDI & +b_{62}INF & +b_{63}EXR & +b_{64}DOP & +b_{65}INFRA & +b_{66}RGDP \end{bmatrix} \text{ This}$$

matrix can be represented as follows:

$$\begin{bmatrix} b_{11} & b_{12} & b_{13} & b_{14} & b_{15} & b_{16} \\ b_{21} & b_{22} & b_{23} & b_{24} & b_{25} & b_{26} \\ b_{31} & b_{32} & b_{33} & b_{34} & b_{35} & b_{36} \\ b_{41} & b_{42} & b_{43} & b_{44} & b_{45} & b_{46} \\ b_{51} & b_{52} & b_{53} & b_{54} & b_{55} & b_{56} \\ b_{61} & b_{62} & b_{63} & b_{64} & b_{65} & b_{66} \end{bmatrix} \begin{bmatrix} FDI \\ INF \\ EXR \\ DOP \\ INFRA \\ RGDP \end{bmatrix} = \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \\ \varepsilon_5 \\ \varepsilon_6 \end{bmatrix}$$

To arrive at the recursive restriction matrix, the followings restrictions were made to retrieve the structural shocks.

1. Foreign direct investment (FDI) is affected by all the variables in the model. This is in consonance with the foreign direct investment function specified in equation 4.
2. Inflation rate (INF) is affected by exchange rates (EXR) only
3. Exchange rates (EXR) are affected by inflation rate (INF) and degree of openness (DOP)
4. DOP is affected by FDI, EXR and INF.
5. Infrastructure (INFRA) is affected FDI, EXR and INF.
6. Growth rate of (RGDP) is affected FDI, EXR, INF and DOP.

From the assumptions above, the following are applicable. In the case of DOP and INFRA that are assumed to be affected FDI, EXR and INF, $b_{45} = b_{46} = b_{55} = b_{56} = 0$. On the restriction placed on INF, the implication is that other variables with the exception of exchange rates (EXR) do not inflation rates. Therefore, $b_{21} = b_{24} = b_{25} = b_{26} = 0$. Exchange rates are assumed to be affected by inflation rate and degree of openness. This implies that $b_{31} = b_{35} = b_{36} = 0$. The growth rate of GDP is affected by INF and EXR. this implies that $b_{61} = b_{64} = b_{65} = 0$

Based on these restrictions, the resultant recursive matrix is presented thus:

$$B_0 = \begin{bmatrix} b_{11} & b_{12} & b_{13} & b_{14} & b_{15} & b_{16} \\ 0 & b_{22} & b_{23} & 0 & 0 & 0 \\ 0 & b_{32} & b_{33} & b_{34} & 0 & 0 \\ b_{41} & b_{42} & b_{43} & b_{44} & 0 & 0 \\ b_{51} & b_{52} & b_{53} & b_{54} & 0 & 0 \\ 0 & b_{62} & b_{63} & 0 & 0 & b_{66} \end{bmatrix}$$

Expressing the restrictions in linear form, we have:

$$FDI = \alpha_1 = C(1) * \alpha_1$$

$$INF = \alpha_2 = C(2) * \alpha_1 + C(3) * \alpha_2$$

$$EXR = \alpha_3 = C(4) * \alpha_1 + C(5) * \alpha_2 + C(6) * \alpha_3$$

$$DOP = \alpha_4 = C(7) * \alpha_1 + C(8) * \alpha_2 + C(9) * \alpha_3 + C(10) * \alpha_4$$

$$INFRA = \alpha_5 = C(11) * \alpha_1 + C(12) * \alpha_2 + C(13) * \alpha_3 + C(14) * \alpha_4 + C(15) * \alpha_5$$

$$RGDP = \alpha_6 = C(16) * \alpha_1 + C(17) * \alpha_2 + C(18) * \alpha_3 + C(19) * \alpha_4 + C(20) * \alpha_5 + C(21) * \alpha_6$$

4.2.1. Stationarity Property of the Series

The data used for the analysis is time series. The major problem associated with that type of data is the serial or autocorrelation problem. If this problem is not taken care of, the results obtained from a data set that is prone to serial correlation problem will be spurious or nonsense. Testing for the stationarity or otherwise of a series involves testing for the unit root. This study tested for unit root using the Augmented Dickey Fuller approach.

Table 1 shows the unit root test results using Augmented Dickey Fuller (trend and intercept) approach. From the results all the series that make up the model were non stationary. To make them stationary, they were all made stationary after first differencing. Since the stationary properties of the series had been determined, we proceeded to estimate the Vector Autoregression by first examining the lag length needed for the estimation. The results which are presented in Table 2.

The results shows that all the criteria selected lag length 2. This forms the basis for the estimation of our Vector Autoregression.

Table 3 displays the estimates of the SVAR model for the determinants of foreign direct investment in Nigeria. These were the results of the model specified and estimated with the objective of investigating the determinants of foreign direct investment in Nigeria. The 21 coefficients gave an insightful depiction of the kind of cross relationships among the variables that make up the model. The coefficients of major concern to this analysis are C(2), C(3), C(4), C(5) and C(6). These are the coefficient of inflation rate (INF), exchange rate (EXR), degree of openness (DOP), infrastructure (INFRA) and growth rate of GDP (RGDP). All the variables were found to be positively related to foreign direct investment with the exception of the coefficient 5, the coefficient associated with infrastructure. The implication of the results is that they all follow the apriori expectation with the exception of infrastructure which was found to be negative as against the expected positive relation. The results however confirm the real infrastructural situation in the country as most of the social and health amenities that can attract FDI into the country are in state of comatose. The impulse response function of the SVAR is presented Figure 1:

The first figure of Figure 1 shows the response of FDI to its own shock. A one standard deviation shock to FDI led to a rise in FDI from period to period three before it started to decline up to period ten, albeit positive movement.. The second figure shows the response of FDI to the shock from

inflation. With an impulse from inflation the response of FDI was positive from period to period ten. The trend was similar to that of exchange rate and degree of openness. In the case of impulse from infrastructure, the response of FDI was negative from period one to 10. The only mixed response noticed was the response from the impulse of growth rate of GDP. While response was negative from period one to period five, it was positive from period six to ten.

Table 4 shows the results of variance decomposition of the first ten periods' horizon into the future. The results show that in the first period, variations in FDI were wholly explained by own shocks. This implies that variations in FDI were hardly affected by other variables in the first period. The results also show that beside own contribution, variations in FDI can only be attributed marginally to variations to inflation, exchange rates, degree of openness, infrastructural and growth rate of GDP. Exchange rates were the most significant variable that affected variations in FDI followed by infrastructure. They accounted for 0.2% and 0.3% in period 4 and by period 10, it rose to 3.3% and 2.6% respectively.

5. Summary and Conclusion

From the foregoing analysis, it is crystal clear that foreign direct investment is one of the many catalysts of economic growth. So many factors are accountable for the foreign direct investment in any given economy. These include inflation, exchange rate, infrastructural facilities available in the destination country, availability of both skilled and unskilled labour to be supplied at cheaper rate, the tax regime obtainable in such an economy, the political stability in such an economy and a host of other factors. The study made use of five explanatory variables; GDP, INF, EXR, DOP, INFRA to explain foreign direct investment in Nigeria. The study concluded among others that economic growth represented RGDP has positive influence on foreign direct investment. That inflation also exerts positive influence on foreign direct investment. That exchange rate is positively related to foreign direct investment. That the degree of openness is positively related to foreign direct investment. That infrastructure is negatively related to foreign direct investment.

From the summary of the analysis so far, the following are recommended for policy purposes: Efforts should be made by the economic team of the nation to put all necessary macroeconomic policies in place for the country to achieve an annual increase in gross domestic product that should be sustained for a long period such that this would act as attraction to foreign direct investment. That the nation's borders should be more liberalized to allow for interaction between the country and the rest of the world. This also would enhance the coming of foreign direct investment into the country. Infrastructure was found to be negatively related to foreign direct investment. This may not be unconnected with sorry state of social and infrastructural facilities in the country. Efforts should be increased in providing steady electricity, pipe born water, good road, internet facilities, communication telecommunication technology and a host of other amenities that have direct bearing of running a successful business in the country.

Endnotes

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Table 1. Augmented Dickey Fuller Unit Root Test**Critical Statistics: 1% = -4.0302, 5% = -3.4441, 10% = -3.1467**

Variables	Level	1 st Difference	Order of Integration
FDI	-2.8164	-3.2880***	I(1)
RGDP	-3.0051	-3.3437**	I(1)
INF	-2.9877	-4.1407*	I(1)
EXR	-1.9248	-3.4276***	I(1)
DOP	-0.9833	-3.7952**	I(1)
INFRA	-1.3607	-3.9125**	I(1)

Source: Author's Computation *Significant @1%, ** Significant@5%, ***Significant@10%

Table 2. Lag Selection Criteria

VAR Lag Order Selection Criteria						
Endogenous variables: FDI INF EXR DOP INFRA RGDP						
Sample: 1981Q1 2016Q4						
Included observations: 140						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-724.3109	NA	0.001368	10.43301	10.55908	10.48424
1	495.0560	2316.797	6.23e-11	-6.472229	-5.589736	-6.113611
2	646.5414	274.8377*	1.20e-11*	-8.122020*	-6.483105*	-7.456014*
3	664.9232	31.77421	1.55e-11	-7.870331	-5.474994	-6.896938
4	677.1621	20.10672	2.21e-11	-7.530887	-4.379127	-6.250106
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

Source: Author's Computation from E-Views 9

Table 3: Structural VAR Estimates of the Foreign Direct Investment Equation

	Coefficient	Std. Error	z-Statistic	Prob.
C(1)	0.435849	0.025863	16.85230	0.0000
C(2)	0.017734	0.033325	0.532150	0.5946
C(3)	0.173082	0.010271	16.85230	0.0000
C(4)	0.044515	0.014869	2.993804	0.0028
C(5)	-0.070504	0.037406	-1.884836	0.0595
C(6)	0.077150	0.004578	16.85230	0.0000
C(7)	-0.080517	0.018459	-4.361959	0.0000
C(8)	0.056665	0.045597	1.242747	0.2140
C(9)	0.281341	0.101038	2.784520	0.0054
C(10)	0.092889	0.005512	16.85230	0.0000
C(11)	0.047429	0.035026	1.354107	0.1757
C(12)	0.056255	0.081689	0.688647	0.4910
C(13)	0.647488	0.184888	3.502063	0.0005
C(14)	0.179641	0.149533	1.201347	0.2296
C(15)	0.165517	0.009822	16.85230	0.0000
C(16)	0.011434	0.006093	1.876679	0.0606
C(17)	0.001450	0.014142	0.102506	0.9184
C(18)	-0.080231	0.033306	-2.408948	0.0160
C(19)	0.159380	0.025975	6.135970	0.0000
C(20)	-0.000955	0.014504	-0.065833	0.9475
C(21)	0.028606	0.001697	16.85230	0.0000

Source: Author's Computation from E-Views 9

Table 4: Variance Decomposition of FDI

Variance Decomposition of FDI:							
Period	S.E.	FDI	INF	EXR	DOP	INFRA	RGDP
1	0.436	100.000	0.000	0.000	0.000	0.000	0.000
2	0.754	99.761	0.002	0.027	0.012	0.032	0.166
3	0.994	99.322	0.020	0.100	0.047	0.144	0.367
4	1.163	98.797	0.076	0.230	0.101	0.346	0.450
5	1.279	98.175	0.180	0.437	0.166	0.623	0.418
6	1.357	97.370	0.327	0.745	0.228	0.956	0.373
7	1.411	96.299	0.498	1.179	0.276	1.328	0.421
8	1.451	94.944	0.667	1.753	0.300	1.731	0.604
9	1.482	93.359	0.809	2.469	0.304	2.164	0.894
10	1.508	91.637	0.908	3.308	0.296	2.625	1.227

Source: Author's Computation

Figure 1: Foreign Direct Investment Impulse Response Function