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Time Series Analysis of Factors Affecting Foreign Direct Investments in Nigeria

Musa Y.[1,a*] and Agwamba E. N.[2]

[1*,2]Department of Mathematics, Statistics Unit, Usmanu Danfodiyo University, Sokoto.

Abstract

This study investigated some factors that influence the inflow of foreign direct investment in Nigeria and the relationship that exists between the selected macroeconomic variables. The study employed Vector error correction model to analyze the short and long run relationships among the variables. Innovation forecasting, impulse response function and variance error decomposition was also used to forecast the variability causes. The study found the existence of long run equilibrium among the variables. The study also found that there is bi-directional causal relationship between FDI in Nigeria and Exchange rate, Inflation rate, and Lending rate, while a uni-directional relationship runs from market size and Interest rate to FDI. The study found that own (FDI) shock decreased from short run and ended below its natural path in the long run. It also found that FDI responds negatively to shocks from inflation rate and market size in the long run. FDI response to shocks from interest rate and lending rate, exchange rate and external debt was just above its natural path. The study also found that own shock explains much of the fluctuations experienced by FDI in the short run, which decreases into the long run. Also, in the long run, Market size, interest rate, inflation rate, lending rate, exchange rate, economic globalization and external debt explain much of the contribution to the fluctuation experienced by FDI in the long-run.

Keywords: FDI, VEC Model, Nigeria

1.0 Introduction

Foreign Direct Investment (FDI) is now the largest source of foreign private capital reaching developing countries. The potential role of foreign capital in accelerating growth and economic transformation has caused many developing countries to seek such investments to accelerate their development efforts. Promoting and attracting foreign capital in the form of foreign direct investment has therefore become a major component of development strategies for developing countries.

In the case of African countries, and Nigeria in particular, the role of FDI as a source of capital has become increasingly important not only because of the belief that it can help bridge the savings–investment gap, but also the belief of spill-over to domestic firms in host countries.

However, attracting FDI is a major challenge for most host countries as they face the problem of identifying and controlling the major factors that influence and determine the FDI location decision in their environment. It is to be noted that the volume of FDI flowing to the Least Developed countries has increased significantly over time, its distribution been characterized by large variations between and within different regions of the world [1]. Nigeria as a country, given her vast natural resources base and large market size, qualifies to be a major recipient of FDI in Africa. However, the level of FDI attracted by Nigeria is low compared with the resource base and potential need [2,3].

That Nigerian economy is in the woods is no longer an issue of debate, especially in the face of dwindling crude oil fortune occasioned by militant activities in the Niger Delta region and the attendant fall in the price of oil at the international oil market. The evidences are seen in the rising level of unemployment and under-employment, poverty, very low level of domestic savings, crime and insecurity, corruption, income inequality, etc. With the current reduction in oil prices to all time low, it has become necessary to augment domestic savings by encouraging FDI inflows. This is to say that FDI is now seen as a driver of development by providing resources for advancement and transformation [4]. With these developments, policy makers have outlined road map for attainment of economic development of which attracting FDI is at its focal point.

Since independence in 1960, several polices have been put in place geared towards the twin objectives of achieving economic growth and maximum domestic production by influencing domestic investment and putting in place polices aimed at stimulating the flow of foreign investment in the various sectors of the economy.

Correspondence Author: Musa Y., Email: arimaym@gmail.com Tel: +2347030168606

While such efforts appear necessary to facilitate the inflow of foreign capital for the development of Nigeria's economy, the success of such initiatives has been short lived [5]. This is due to lack of efficient and effective co-ordination of the prevailing local business operating conditions and the supporting factors which attracts FDI into Nigeria. Since FDI is promoted as the panacea to changing the economic fortunes of Nigeria, the questions confronting us are: what factors influence FDI inflow into Nigeria? To what extent has FDI contributed to the growth and development of the country in the period under review? In effect, did the economy grow as a result of FDI inflows in the years 1974 to 2014.

Therefore, in the light of the foregoing, it becomes very clear that the flow of FDI into the country is a very vital panacea to our economic woes. Hence, there is the need for government to clearly understand the factors that will promote FDI inflow to the economy. It is against this background that we embarking on this study in the hope that it will empirically isolate these factors and prioritize those that are critical to the Nigerian economy.

An extensive body of empirical studies exists on the flow of Foreign Direct Investment (FDI) and its determinants.

Vector error correction model was used in [6] to examined the factors influencing FDI flows into the Nigerian economy. The study revealed that the market size is significant in attracting FDI into Nigeria. Deregulation of the economy was positively related to FDI inflows and also significant. Political instability in the previous year appeared to have a significant positive effect on FDI. Furthermore, the results reveal that exchange rate is significant in explaining changes in FDI.

Co-integrated VAR model and VEC model was employed in [7] to study the causal impact of foreign direct investment on gross domestic product with other four macroeconomic variables in the Nigerian economy for the period of 1970 to 2004. The result showed that FDI has impact on GDP. It also showed that there exist a long run relationship between FDI and GDP.

The Vector Error Correction Model (VECM) was utilized in [8] to examine the determinants and impact of FDI in Nigeria. Granger causality methodology was used to analyze and establish the nature of relationship between FDI and its determinants on one side and economic development on the other. Their empirical analysis reveals that macroeconomic variables (exchange rate, interest rate, inflation) and openness of the economy are among the major and important factors that determine the inflow of FDI into Nigeria during these periods.

The Generalized Method of Moment (GMM) was adopted in [9] for the analysis of the macroeconomic determinants of foreign direct investment in Nigeria. He used annual time series data for the period of 1985 to 2010. The results from the GMM estimates showed that only exchange rate, interest rate, Market size and Openness of economy determine foreign direct investment in Nigeria.

Determinants of FDI in Nigeria were investigated in [10]. Using time series econometrics techniques incorporating stationarity test, co-integration, error correction mechanism and variance decomposition analysis. The analyses revealed that Exchange rate exerts a long run negative effect on FDI flows in Nigeria.

Determinants of foreign Direct Investment in Nigeria were investigated in [11] using the vector error correction model approach. The results show that the major determinant of foreign capital inflow in the economy is the ratio of external debt to Gross Domestic Product both in the short run and long run.

A study was conducted in [4] to determine the determinants of foreign direct investments in Nigeria. They analysed the time series data covering the period 1980 – 2011 using the multiple regression analysis. They investigated 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 between real wage rates and inflow of FDI.

Some macroeconomic determinants of inflow of foreign direct investment (FDI) in Nigeria were analyzed in [12]. The result reveals that there is long run relationship between FDI inflows and the macroeconomics determinants. Also error correction test was performed on the series, and the study found that credit to the private sector proxy for financial development, GDP proxy for market sized and exchange rate are the main macroeconomic determinant factors which determine the inflow of FDI in Nigeria.

The study in [13] examined FDI as a function of five other variables which include Market size, trade openness, Infrastructure, Natural resources and Inflation rate. The result showed that there is positive causality running from market size to FDI and also, positive causality also exists between inflation and FDI. There exist also a causal relationship running from macroeconomic stability to market size, and finally, natural resources also have a positive causal relationship with openness of the economy.

The determinants of FDI in Pakistan was empirically investigated in [14] . Their analysis identified some economic determinants of FDI in Pakistan, like GDP growth rate, volume of exports, human population, tariff on imports and price index. Volume of exports emerged the most powerful determinant of FDI.

Determinants of foreign direct investment (FDI) for a panel of ten OECD member countries were explored in [15]. Granger causality tests were used to identify causalities, both in the short- and long-run, between FDI and the variables that emerge as significant determinants of FDI during the study period. Estimated results of fixed effects estimation indicate that market size, labor cost and quality of infrastructure have significant effect on FDI for the panel of countries. A bi-directional short-run relationship is established between market size and labor costs in the short-run; whereas quality of infrastructure causes market size and labor costs in the short-run. In the long-run, a deviation of FDI from equilibrium was recorded. However, market size, labor costs and quality of infrastructure all exerted joint effect in the short-run to re-establish the equilibrium.

Finally, the determinants of FDI in Iran was investigated in [16]. Simple econometric model and Ordinary least squares technique were used to determine the various economic factors that affect FDI inflows.

The departure of this study from other studies on the area of study is the inclusion of economic globalization as an important factor that affect FDI in Nigeria. The study also addressed the shortcomings of the traditional granger causality test adopted by reviewed works by employing the Toda-Yamamoto causality test in exploring the causal relationships between FDI and the economic variables in our model. This study also went beyond analysis of the causal relationship between FDI and determining factors by exploring the proportion of systemic movement of the variables due to shocks (innovations) to itself and shocks to other variable(s) by carrying out impulse response analysis. We also added to the works of lead literature by investigating the forecast error variance decomposition.

2. Materials and Methods

This section seeks to shed light on the methods and techniques to be adopted to arrive at the objectives of the study.

The stationarity profile of the various time series data is assessed using Dickey-Fuller Generalized Least Squares (DF GLS) test. This study is adopting the Vector Error correction model procedure. Using the VAR co-integration procedure, the long run relationship between the FDI and the explanatory variables will be investigated. Where the series are found to be co-integrated, the short run relationships will be assessed using the Vector Error Correction (VEC) procedure. We further carried out a causality analysis using the dynamic Toda-Yamamoto causality test. We also, carried out an Impulse Response function Analysis and a forecast error variance decomposition analysis on our series.

2.1 Data Sources and Data Description

The data used for this study is the annual time series of the selected variables and covers the period of 1974 to 2014. The variables include: (i) Market size Ms; (ii) External debt, ExD; (iii) Lending Rate, Lr; (iv) Exchange rate, Exr; (v) Inflation rate, Inf,; (vi) Interest Rate, Int; and (vii) the level of Economic globalization (Ecg).

The sources of data are from the World Bank Databank – Nigeria Data portal, the global economy data base/ Nigerian portal, Swiss Institute of Technology, Zurich, and the International Monetary Fund International Financial Statistics covering the period between 1974 and 2014.

2.2 Model Specification

We adopted the VEC model procedure for our analysis as against the Multiple regression model as was used in [4].

For the purpose of analysing specific effects of different factors on the foreign direct investment in Nigeria, this study has specified in vector FDI as a function of seven variables as shown in the following model:.

$$LnFDI_t = \alpha_0 + \alpha_1 LnMs + \alpha_2 LnInt + \alpha_3 LnInf + \alpha_4 LnLr + \alpha_5 LnExr + \alpha_6 LnEcg + \alpha_7 LnExD + \varepsilon_t \quad (1)$$

Where,

LnFDI is the natural log of foreign direct investment inflow, LnMs is the natural log of market size, LnInt is natural log of Deposit interest rate, LnInf is natural log of inflation, LnEXr is the natural log of exchange rate, LnLr is the natural log of lending rate, LnEcG is natural log of economic globalization , LnExD is the natural log of external debt, α_0 is a constant, $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7$ are coefficients to be estimated, ε_t is the unobservable error term. The consideration for the above variables is based on the fact that investment in Nigeria could be considered given favourable conditions of these variables in Nigeria.

The general form of a vector autoregressive (VAR) of order p framework developed in [17], is given by the following unrestricted (reduced form) system.

$$y_t = \delta + \phi_1 y_{t-1} + ... + \phi_p y_{t-p} + \varepsilon_t \quad (2)$$

Hence, in compact form Equ.(2) become

$$\phi(\mathrm{L}) y_t = \delta + \varepsilon_t \quad (3)$$

Where $\phi(\mathrm{L}) = [I_n - (\phi L + \phi_2 L^2 + ... + \phi_p L^p)]$ i.e a matrix of polynomials in the lag operator, $y_t = [y_{1,t}, ..., y_{k,t}]'$ is the set of K×1 time series vector of variables, δ is the constant term, ϕ_i's are (K×K) coefficient matrices, $\varepsilon_t = [\varepsilon_{1t}, \varepsilon_{2t}, ...\varepsilon_{kt}]'$ is a k×1 vector of non-autocorrelated disturbances (or innovations) with zero mean and contemporaneous covariance matrix $E\{\varepsilon\varepsilon'\} = \sum$ and are i.i.d (N) over time, p is the number of lags.

Once there is a co-integration relationship among the variables, this relationship which is of particular interest to us is better analyzed using Vector Error Correction Model (VECM), which is given by:

$$\Delta y_{t-1} = \Pi y_{t-1} + \Gamma_1 \Delta y_{t-1} + ... + \Gamma_{p-1} \Delta y_{t-1+p} + \delta + \varepsilon_t \quad (4)$$

Where,

$\Pi = -(I_k - \phi_1 - ... - \phi_p)$ and $\Gamma_j = -(\phi_{j+1} + ... + \phi_p)$ for j= 1,2,...,p-1.

Πy_{t-1} Contain the co-integration relations. This Πy_{t-1} is often referred to as the long-run term of the model. The short term movements or dynamics of the variables are determined by the Γ_j's (j=1, 2,.., p-1) which are called short-run parameters or short-run dynamics. Hence, the model in (4) is abbreviated as the VECM (p-1).

Specifically, for our study, we have:

$$\Delta LnFDI_t = \alpha_0 + \alpha_1 \Delta LnMs + \alpha_2 \Delta LnInt + \alpha_3 \Delta LnInf + \alpha_4 \Delta LnLr + \alpha_5 \Delta LnExr + \alpha_6 \Delta LnEcg + \alpha_7 \Delta LnExD + \lambda_i \sum_i ECM + \varepsilon_t \quad (5)$$

Where, Δ is the first difference of the variables. Other variables are defined as in above.

Granger Causality based on Toda-Yamamoto Procedure

The scope of this work includes investigating the causal relationship existing between the variables of interest in this study. The most common way to test the causal relationship between variables is the Granger-Causality test proposed in [18]. The test involves estimating the following simple vector auto-regressions (VAR):

$$X_t = \sum_{i=1}^{n} \alpha_i y_{t-i} + \sum_{j=1}^{n} \beta_j X_{t-j} + \mu_{1t}$$

$$Y_t = \sum_{i=1}^{m} \lambda_i X_{t-i} + \sum_{j=1}^{m} \delta_j Y_{t-j} + \mu_{2t}$$

Where, it is assumed that the disturbances μ_{1t} and μ_{2t} are uncorrelated. The first equation represents that variable X is caused by lagged variable Y and X. The second equation has variable Y being caused by the lagged values of X and Y.

According to [18], a variable Y is said to "Granger-cause" X, if and only if X is better predicted by using the past values of Y. In this study, if FDI causes Ms, and Ms does not cause FDI, it is a unidirectional causality that runs from FDI to Ms. If FDI do not cause Ms and Ms does not cause FDI, then Ms and FDI are statistically independent. If FDI causes Ms and Ms Causes FDI, then a feedback exists between Ms and FDI.

In other words, researchers can jointly test if the estimated lagged coefficient $\Sigma\alpha_i$ and $\Sigma\lambda_j$ are different from zero with F-statistics. When the joint test reject the two null hypotheses that $\Sigma\alpha_i$ and $\Sigma\lambda_j$ both are not different from zero, causal relationships between X and Y are confirmed.

Interesting yet simple procedures which we are going to adopt in this study are proposed in [19]. It requires the estimation of an augmented VAR which guarantees the asymptotic distribution of the Wald statistic (an asymptotic χ2-distribution) since the testing procedure is robust to the integration and co-integration properties of the process.

The augmented Granger causality test method in [19] is based on the following equations:

$$Y_t = \alpha_1 + \sum_{i=1}^{h+d} \lambda_{1i} Y_{t-i} + \sum_{i=1}^{k+d} \lambda_{2j} X_{t-i} + \varepsilon_{yt}$$

$$X_t = \alpha_2 + \sum_{i=1}^{k+d} \beta_{1i} X_{t-i} + \sum_{i=1}^{h+d} \beta_{2j} Y_{t-i} + \varepsilon_{xt}$$

Where,

d is the maximum order of integration suspected to occur in the system; h the optimal lag length of Y_t and k is the optimal lag length of X_t and ε_t are error terms $\varepsilon_{y_t} \sim WN(0, \Sigma_{\varepsilon_y})$ and $\varepsilon_{x_t} \sim WN(0, \Sigma_{\varepsilon_x})$ are the residuals of the model and Σ_{ε_y} and Σ_{ε_x} the covariance matrices of ε_{y_t} and ε_{x_t}, respectively.

3.0 Results and Discussion

Table 1 reports the result of the DF-GLS unit root test. The result shows that the natural log of all the variables under investigation are integrated of order one, I(1).

Table 1: Dickey-Fuller-GLS unit root Test

Variable	Intercept			Intercept & Trend		
	t-statistic	5% C.V	Order	t-statistic	5% C.V	Order
LnFDI	-1.488090	-1.949609	I(1)	-2.922831	-3.190000	I(1)
LnMs	-0.401230	-1.949609	I(1)	-0.665225	-3.190000	I(1)
LnInt	-0.772668	-2.630762	I(1)	-1.646598	-3.190000	I(1)
LnInf	-0.908359	-1.949609	I(0)	-1.113366	-3.190000	I(0)
LnLr	- 0.911930	-1.949319	I(1)	-1.203314	-3.196000	I(1)
LnExr	0.432227	-1.949319	I(1)	-1.231072	-3.196000	I(1)
LnEcg	-0.051783	-1.949319	I(1)	-1.707799	-3.196000	I(1)
LnExD	-0.747130	-1.949319	1(1)	-0.845730	-3.190000	I(1)

3.1 Co-integration Analysis

To determine the number of cointegrating relations r conditional on the assumptions made about the trend, we can proceed sequentially from $r = 0$ to $r = n - 1$ until we fail to reject the null hypothesis. The result show that the statistical hypothesis of no cointegration are rejected at r = 0, r ≤1, r ≤ 2, and r ≤ 3 for both Trace test and Maximum Eigen value test. Both the trace test and Maximum Eigenvalue test indicate four cointegration equations at 5% level of significance. This is a confirmation of the existence of long run relationship among the non-stationary variables. This means that the linear combinations of the non-stationary variables under study are stationary and integrated of an order higher than their linear combination.

Table 2: Trace Test Result

Hypothesized No. Of CE(S)	H_0	H_1	Eigen Value	$\lambda_{\text{Trace Test}}$	5% Critical Value	Prob***
None*	r=0	r≥1	0.949297	250.9526	125.6154	0.0000
Atmost 1*	r≤1	r≥2	0.816134	149.5859	95.75366	0.0000
Atmost 2*	r≤2	r≥3	0.681476	92.00521	69.81889	0.0003
Atmost 3*	r≤3	r≥4	0.589177	53.10724	47.85613	0.0148
Atmost 4	r≤4	r≥5	0.313478	22.86107	29.79707	0.2530
Atmost 5	r≤5	r≥6	0.219697	10.07308	15.49471	0.2751
Atmost 6	r≤6	r≥7	0.047051	1.638602	3.841466	0.2005

Trace test indicates 4 cointegrating equations at 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
** p-values

Table 3: Maximum Eigen value Test Result

Hypothesized No. Of CE(S)	H_0	H_1	Eigen Value	$\lambda_{\text{Max-Eigen stat}}$	5% Critical Value	Prob**
None*	r=0	r=1	0.949277	101.3667	46.23142	0.0000
At most 1*	r≤1	r=2	0.816134	57.58067	40.07757	0.0002
At most 2*	r≤2	r=3	0.681476	38.89797	33.87687	0.0116
At most 3*	r≤3	r=4	0.589177	30.24616	27.58434	0.0222
At most 4	r≤4	r=5	0.313478	12.78799	21.13162	0.4719
At most 5	r≤5	r=6	0.219697	8.434481	14.26460	0.3363
At most 6	r≤6	r=7	0.047051	1.638602	3.841466	0.2005

Trace test indicates 4 cointegrating equations at 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
** p-values

3.2 Vector Error Correction (VEC) Analysis

VEC model specifications can only be estimated if there is a cointegrating relationship among the variables which, according to the Johansen test, is indeed the case for our study.

3.3 Cointegration Equation Estimate(Long run relationships)

The four cointegration vector normalized on FDI, Ms, Int and Lr which are also called the VEC models beta vectors.

$$Ceq_1 = -102.4234 + LnFDI - 4.469445LnExr + 30.8217LnEcg - 1.476759LnExD$$

$$Ceq_2 = -68.98774 + LnMs - 2.543096LnExr + 18.21405LnEcg - 0.506289LnExD$$

$$Ceq_3 = -61.42536 + LnInt - 2.625461LnExr + 17.83076LnEcg - 0.723044LnExD$$

$$Ceq_4 = -133.1651 + LnLr - 5.67292LnExr + 39.35724LnEcg - 1.710071LnExD$$

This result implies that Exr and ExD have positive impact on FDI in the long run, while Ecg impact FDI negatively in the long run. In other words, a ceteris paribus increase in exchange rate and external Debt induced FDI flows to Nigeria in the long run within the time frame under review, while a ceteris paribus increase in economic globalisation reduced inflows to the country also in the long run during the time under review. For instance, a1% improvement in FDI inflow during the time frame under investigation was actually as a result of 4.47% appreciation in the value of the naira against the US-dollar.

3.4 Toda-Yamamoto Causality (MWALD) Test

This section discusses the direction of causality between FDI and the macroeconomic variables used in this study. The Table 4 shows the result of the test based on Toda-Yamamoto procedure. The estimates of the test (T-stat) are standard χ^2 -statistics.

Table 4: Granger causality based on Toda Yamamoto

Null Hypothesis (H_0)	T-Stat	p-value	Granger causality Decision at 5%
FDI does not granger cause Ms	1.07232	0.28357490	H_0 accepted
Ms does not granger cause FDI	3.77932	0.00015725	H_0 rejected
FDI does not granger cause Int	1.00422	0.31527100	H_0 accepted
Int does not granger cause FDI	-2.65446	0.00079435	H_0 rejected
FDI does not granger cause Inf	4.92983	0.00000082	H_0 rejected
Inf does not granger cause FDI	-2.83677	0.00455731	H_0 rejected
FDI does not granger cause Lr	2.96978	0.00298016	H_0 rejected
Lr does not granger cause FDI	-2.63797	0.000834036	H_0 rejected
FDI does not granger cause Exr	-2.84415	0.00445295	H_0 rejected
Exr does not granger cause FDI	5.02967	0.00000049	H_0 rejected
FDI does not granger cause Ecg	-4.24768	0.00002160	H_0 rejected
Ecg does not granger cause FDI	1.39192	0.16394512	H_0 accepted
FDI does not granger cause ExD	-2.80132	0.00508937	H_0 rejected
ExD does not granger cause FDI	-1.32291	0.18586612	H_0 accepted

The result of the test shows that there is a one-way causality running from Market size to FDI. This implies that there is a positive and uni-direct relationship between Ms and FDI, which indicates that there is a positive and direct relationship between Ms and FDI. This means that the higher the level of economic and development activities in Nigeria, the higher the flow of FDI into the country. LnInt Granger cause LnFDI implies that better and increase deposit interest rate in the economy lead to increased trading relationship with the rest of the world. Thereby, attracting more foreign flow of investment to Nigeria since foreign investors usually seeks for higher return on their investment. There is also a uni-directional causality running from FDI to economic globalisation. This means that economic globalisation did not lead to increased flow of FDI into the country within the time frame under investigation. This is expected given the fact that hidden import barriers, mean tariff regimes and high taxes on international trade don't encourage inflow of foreign investments.

There is a bi-directional causal relationship between FDI and inflation rate. This implies that within the period under review, FDI granger cause Inflation and vice versa. There is also a bi-directional causal relationship between FDI and Lending rate. This means that FDI granger cause lending rate and Lending rate granger cause FDI within the period under investigation. This implies that within the period under review, investors are attracted where cost of doing business is low and will yield more returns on investment. There is also a bi-directional causal relationship between exchange rate and FDI within the period under consideration. FDI does not granger cause Market size and Interest rate within the period under investigation. Within the time frame under investigation, economic globalisation and external debt does not granger cause FDI.

3.5 Impulse Response Function (IRF) Analysis

The Cholesky impulse Decomposition method captures the IRF'S of FDI to all kinds of shocks in the system. The interpretation of the impulse response functions takes into account the first differencing of the variables as well as the vector error correction estimates. A value of zero will mean that the variable has no effect on FDI. Hence, the variable would have continued on the same part, had there been no shock from that variable to the system. A positive value is an indication that the shock would cause the variable to be above its original path. Similarly, a negative value indicates that the shock would cause the variable to be below its natural path. We set the response forecast period at ten years. This avails us with the privilege of capturing both the long term and short term responses.

Figure below shows the impulse response function of FDI shocks. The response of FDI due to its own shocks in the first year is positive but went on an irregular sharp decline from short-run to below its natural path even in the long run.

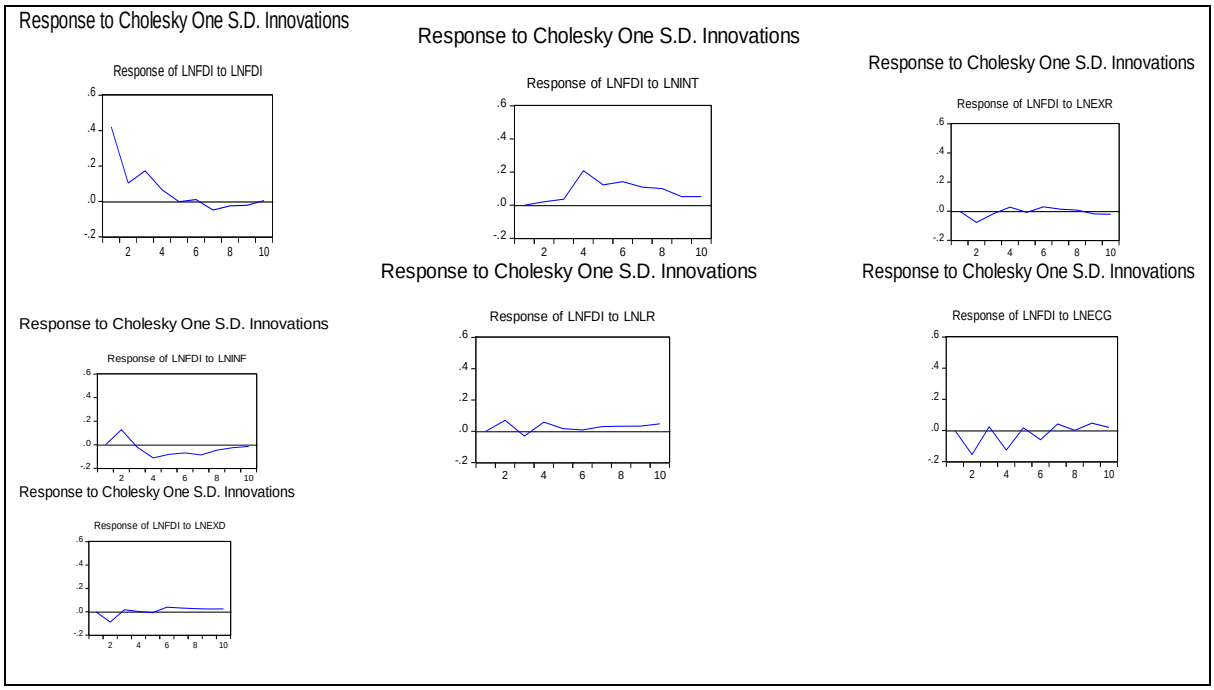

Figure 1: Impulse Response of FDI to Shocks

There was no response from FDI impulse due to shock from market size in the first year which climbed to a higher positive level in the second and third period before declining to nearly no effect in the fifth year. It further declined to a negative response in the sixth year and maintained this negative response even in the long run.

FDI had no response to innovations from Deposit Interest rate in the first year. But this changed from the second year moving up positively to its peak in the fourth before coming down still maintaining this positive path even in the long run.

Also, FDI had no response to impulse from inflation rate in the first year. In the second year, it moved up in the positive direction but swiftly made a u-turn to a negative response in the third year and maintained a negative level response up to the long run.

FDI had no response to innovations from Lending rate in the first year, responded slightly positive in the second year and assumed an irregular pattern of response over and below its natural path over a long period but ended up slightly positive in the long run.

The response of FDI to shocks from exchange rate started with no effect in the first year and took a dip to series of negative response from second year through the most path of the six years that followed. From the seventh year, it started responding negatively to impulses from FDI.

FDI had no response to shocks due to Economic globalisation in the first year but responded negatively in the second year, maintained a slight negative to possitive response over its natural response path till the tenth year.

The response to impulse from external Debt also was nill in the first and descended to a negative response till the sixth year. It started responding possitively from the seventh year and maintained this path way up to the tenth year.

3.6 Forecast Error Variance Decomposition (FEVD) Analysis

Here, we are going to consider a forecast period of ten years ahead. A period of three years will be considered short term, while a period of ten years will be regarded as long term. So, our analysis will cover both short term and long term periods.

Table 5: variance decomposition of LnFDI

Variance Decomposition of LNFDI:

Period	S.E.	LNFDI	LNMS	LNINT	LNINF	LNLR	LNEXR	LNECG	LNEXD
1	0.421376	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.512917	71.58871	5.860713	0.164466	6.197016	1.870771	2.282348	9.087272	2.948702
3	0.544809	73.48827	5.202038	0.582666	5.661228	1.973553	2.138262	8.237851	2.716133
4	0.615068	58.78105	4.427649	11.89570	7.737114	2.443415	1.879640	10.70218	2.133255
5	0.633473	55.41589	4.346136	14.94872	8.944621	2.372891	1.788726	10.15957	2.023440
6	0.658926	51.24194	4.482337	18.41597	9.361358	2.207141	1.858829	10.21646	2.215972
7	0.679461	48.70484	4.656469	19.85596	10.44065	2.271826	1.786052	9.979291	2.304908
8	0.696574	46.46947	6.268288	20.96205	10.37629	2.376842	1.709429	9.495092	2.342539
9	0.709883	44.84164	8.176159	20.70046	10.11787	2.504196	1.715037	9.577139	2.367500
10	0.723472	43.17587	10.34951	20.43718	9.778291	2.838759	1.735304	9.293442	2.391642

From Table 5, the target is foreign Direct Investment. In the short run, innovation to FDI account for about 100% variation in the first year, 71.56% variation in the second year, and 73.496% variation in the third year, of the fluctuations in FDI (i.e own shock).

In the Long run, as we can see from the table, the contribution by the shock to FDI (this is own shock) is decreasing from 58.8% at the fourth year to 43.2% in ten years' time. For Ms, there is gradual increase from the short run period to a maximum of about 8.2% in eight years, then, the contribution moved up to about 10.35% in ten years' time. Interest rate contribution to fluctuation in FDI got to a peak of about 20.9% in eight years' time, and then started a slight drop to about 20.4% in ten years. The contribution of Inflation to the fluctuations in FDI will continue increasing slightly thereby contributing 10.1% of the entire fluctuations in FDI inflow in ten years' time. Lending rate will be increasing its small contribution and will cause 2.8% innovations in FDI in the long run. The contribution of Exchange rate to the variance fluctuation in FDI will be on a gradual increase in the long run to about 1.73% in ten years. There is small but continuous variation in FDI caused by economic globalisation, which took a small dip in ten years. Similarly, the percentage of variation in FDI which could be traced to External debt is small but gradually will increase in the long run.

4.0 Conclusion

The cointegration equation estimates established that FDI has a long term negatively relationship with Economic globalization within the time frame under investigation. This implies that during the time under review, the government policies as it relates to import barriers, tariff regimes and taxes on international trade were favourable to inflow of FDI. Market size, deposit interest rate, and lending rate relates positively with FDI. Therefore, improvement in policies on deposit interest rates and market size in the country would lead to improvement in the inflow of FDI into the country. Also, improvement in cost of doing business would lead to more inflow of foreign investments into the country.

There is a long-run positive relationship between FDI and exchange rate which may be attributed to high level of currency depreciation during this period. Therefore, reduction in the value of our local currency would negatively impact on the inflow of foreign investments into the country in the long term.

FDI response to shocks on external debt hovers so much around its natural path especially in the long-run. This implies that the current external debt profile of Nigeria was a major bane of the attraction of meaningful foreign capital inflow in the country within the time frame under investigation. However, in the long run, and with appropriate adjustments in market size, Real interest Rate and Exchange Rate, the economy can gain significant foreign capital inflow.

In the long run, Inflation, market size, deposits interest rate, and economic globalization jointly explains most of the forecast error variance in FDI. As regards the impact of inflation as explanatory variable on FDI, the percentage contribution to FDI variance fluctuation based on the analysis is expected since the inflation in Nigeria is justified on the ground of deficient domestic production which is lower than the market demand and as such, it has to import most of her goods. Coupled with system failures, foreign investors are not motivated by the demand in Nigeria to move in their capitals and such inflationary pressures in the country scare away foreign investors because the business environments which when put together add to the overhead costs which could prevent high return on investment.

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