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Dynamics Stochastic Interaction Approach to Foreign Direct Investment (FDI), Non-Oil Exports and Economic Growth in Nigeria

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Abstract:

This study was motivated owing to the current need to critically examine the dynamic interaction of FDI, exports and economic growth in Nigeria which has received little attention in the literature. The study extracted data from CBN Statistical Bulletin and UNCTAD investment report from 1980-2016. Consequently, impulse response and variance decomposition were tested. The results of the study show that the interactions among FDI, exports and economic growth appear very weak and do not follow a predictable pattern in Nigeria: that foreign direct investment should lead to improvement in exports and eventually expand the frontier of economic growth. This suggests that there are some structural rigidities in the economy that are preventing the impact of exports from being fully felt by the economy, particularly through economic growth channel. This further reinforces the presence of some institutional factors that create inherent problems in the economy that could frustrate any valid and sincere investment policies formulated by the government. The study recommends among others that that policy shocks to FDI, exports, and economic growth in Nigeria do not show immediate responses in the desired direction. Therefore, policy makers should as a matter of fact bear it in mind the time lag it involves in order to ensure appropriateness in the timing of policies in this regard.

Keywords; *FDI, exports, economic growth, impulse response, variance decomposition, Nigeria*

1. Introduction

In the past three decades, Foreign Direct Investment (FDI) inflows and outflows have been connecting the African economies to the rest of the world. The strategic roles in which FDI inflows are playing in African economies have necessitated many policy makers in this region of the world to embark on different policy measures to motivate further attraction of this indispensable variable to the continent. As a matter of fact, Nigeria has been identified as the principal FDI inflows destination in ECOWAS sub region in the past few decades. This statement was reinforced by the submission of UNCTAD (2007) which argued that 70% FDI inflows to West Africa sub region finds its way to the Nigerian economy. However, Nigerian economy does not possess strategic characteristics of emerging economies like the Asian Tigers and South Africa in terms of friendly investment climate, modern infrastructural facilities and well developed financial and institutional mechanism yet her huge consumer market alongside with relatively larger average-income, enormous natural resource endowments, good communication and network system has given the country a competitive advantage over some other African nations in attracting FDI.

Meanwhile, before the discovery of oil in Nigeria, exports in agricultural inputs and intermediate products constituted the life wire of the Nigerian economy. The oil boom of 1970s shifted the attention of the Nigerian economy from agriculture which had once been the principal component of the country's gross domestic product. From 1970 till date, the over reliance of the country on proceeds from crude oil has been identified a critical factor that has not allowed the country from being insulated from unfavorable global oil price shocks (Enoma and Mustafa, 2011). Consequently, it has been registered in the literature that, there are various ways by which FDI and economic growth are linked through exports. Goldberg and Klein, (1998) argued that multiplier effects of FDI in propelling export promotion, import substitution, or greater trade in intermediate inputs has been the major basis of business existence between parent and affiliate producers. The role of exports in attracting FDI inflows by the country cannot be undermined as such, OECD (1998) submitted that the compelling reason for persistent investment by most multinational firms in foreign countries is

geared towards exports, which has the capacity and capability to integrate host economy with the global community with a view to in generating economic growth in the long run.

In the recent time, the behavior of non-oil exports in Nigeria has been improving consistently. Evidence from the Central Bank of Nigeria, 2007 showed that the third quarter of 2007 Gross Domestic Product was increased by 0.31 of the second quarter. This growth has been arrogated to the improvement in the performance of the nonoil sector. It is worth of note to stress here that non-oil exports serve a cushion effect to set back the country experienced in 2007 as result of shot fall in oil production orchestrated by the crisis in the Niger Delta region of the country. (IMF, 2008)

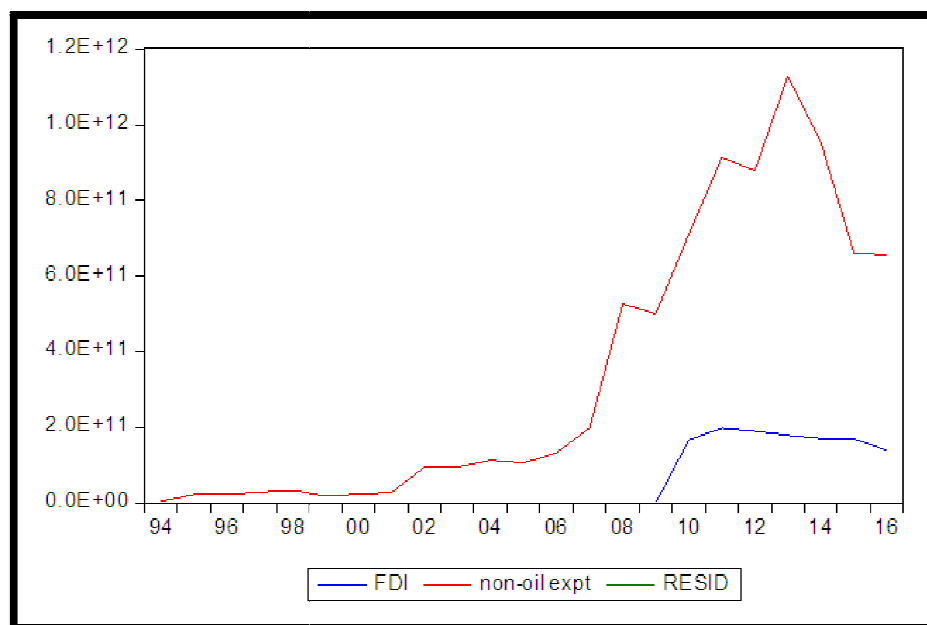


Figure 1: FDI Inflows and Non-Oil Exports in Nigeria 1994-2016

Source: CBN, UNCTAD, 2017

From figure 1 above, it could be deduced that FDI inflows in Nigeria has been growing on a consistent basis from 1994 to 2008. It got to its pinnacle in 2011, though there was amid-break in inflows in 2008, but the years after 2012 have been characterized with persistent declining in inflows. On the other hands, the performance of non-oil exports in Nigeria is not noticeable from 1994 to 2007. It was 2008 that the performance of this variable started becoming visible, and since then the growth has been fluctuating consistently.

From the above report, it could be established that FDI inflows and non- oil exports have been interacting in the country in the past 2 decades. There have been different approaches adopted by scholars to investigate the relationship that exists between these important economic variables in Nigeria in the time past. See Otepola (2002), Akinlo (2004), Onayemi and Akintoye (2009), Okodua (2009), Aderemi and Aberu, 2018. There have been few studies that examined the nexus between FDI, non-oil exports and economic growth in Nigeria in the recent time. These studies failed to utilize dynamics stochastic approach to critically analyze the relationship that exists between FDI, non-oil exports and economic growth in Nigeria. In view of the above, the study is set to contribute to the existing literature in that regard. Hence, relevance of this study.

2. Literature Review

This section of the paper provides both theoretical and empirical review of literature on how foreign direct investment, non-oil exports and economic growth are linked;

2.1. The New Growth Theory

The new growth theory popularly known as endogenous growth theory which was championed by Paul Romer (1986). The theory integrates technology in such a way it can be related with function of the market. It sees advancement in technology as a direct product of investment level, capital stock and human capital in the economy. The theory majorly capitalizes on knowledge as a paramount catalyst of propelling economic growth. It is the investment in human capital that stimulate economic growth. This theory opines that, when national market is liberalized it will draw more local and foreign investment into the economy which in turn leads to an increase in capital accumulation with economic growth as the overall resultant effect.

However, it is expected that for an economy sustain its growth it will continue to direct investment towards research and development innovation that will speed up rate economic growth thereby generating more income and improving welfare of the citizenry

Researcher	Year	Country	Methodology	Results
Oyinlola	2005	Nigeria	Using Chenery and Stout's two-gap model Chenery and Stout, (1966),	The study showed that FDI and economic development have a negative relationship in Nigeria.
Zakia and Ziad	2007	Jordan	Testing the imports on the same dependent variable over the period 1976-2003	The estimated results indicated the existence of bi-directional relationship between FDI and output, and between imports and output as well.
Zsofia and Migeul	2013	Hungary	Using unit root, cointegration analysis and error correction model	The study indicated that a stable long-run relationship existed among the included variables,
Akinlo	2004	Nigeria	Using data for the period 1970 to 2001 to estimate error correction model (ECM)	The results showed that both private capital and lagged foreign capital have small and insignificant impact on economic growth. This study however established the positive and significant impact of export on growth.
Abogan, Akinola and Baruwa	2014	Nigeria	Ordinary Least Square Methods and Error correction mechanism alongside with over-parametrization and parsimonious were used	Johansen Co integration test revealed that the variables of interest were co integrated which confirmed the existence of long-run equilibrium relationship between the variables.
Efobi and Osabuohien	2011	Nigeria	1970 to 2007 using the Vector Auto-Regressive (VAR) technique	The study established that there exists a long-run relationship between the ACGSF and export, but the magnitude is minimal. It was therefore recommended, inter alia, that adequate infrastructural and storage facilities, which increase the shelf-life of agricultural outputs are needed to improve non-oil exports in Nigeria
Onodugo, Ikpe and Anowor	2013	Nigeria	Employing data from 1981 to 2012 to estimate Augmented Production Function (APF) and Endogenous Growth Model (EGM)	The study revealed non-oil export and economic growth in Nigeria showed a moderate relationship.
Aderemi and Aberu	2018	Nigeria	Employing data from 1980 to 2016 using granger causality approach	The study showed that a unidirectional causality runs from FDI to economic growth as well as non-oil exports in Nigeria.

Table 1: Empirical Literature on FDI, Non-Oil Exports in Nigeria

Source: Authors' Compilation, 2018

2.2. Empirical Literature on FDI, Non-Oil Exports in Sub Saharan African Countries

Ayadi, Ajibolade, William and Hyman (2010), evaluated the long-term relationship between corruption and FDI inflows in Sub Saharan African countries with aid of panel in conjunction with the Fernandez Arias and Montiel framework. The findings of the study revealed that foreign direct investment and level of transparency have a long run equilibrium relationship. However, Ojo and Alege (2010), while examining 27 countries in Africa between 1987 to 2007, with a view to analyzing the current global financial crisis, policy implications and the impact of the sudden rise on FDI flows, as well as the consequent financial and economic development in Africa. The authors employed panel Vector Auto regression. The result of the study showed a direct significant relationship between gross domestic product and foreign capital inflows in Africa. Similarly, Hausmann and Fernandez (2000), adopted cross sectional data, to estimate both panel and sub-period panel regressions on foreign direct investment and trade openness in Sub Saharan African Economies. The results of the analysis confirmed that a higher investment return alongside with improvement in infrastructure brings about positive impact to foreign direct investment inflows into Sub Saharan African economies. But, foreign direct investment showed no significant impact on the gross domestic product of the continent. However, it could be concluded from the above reviewed empirical studies, that there are a lot of augments and controversies in the type and kind of relationship that exists among FDI, exports and economic growth in Nigeria. More importantly, the literature is silent about stochastic dynamic interaction approach to foreign direct investment, non-oil exports and economic growth in Nigeria. Therefore, this study would move the frontiers of knowledge in that regard.

3. Methodology

3.1. Introduction

This study makes use of secondary data from 1980 to 2016. The data on GDP and exports are sourced from Central Bank of Nigeria Statistical Bulletin. Meanwhile, data on FDI are sourced from UNCTAD database published by World Bank. VAR modeling was estimated using E-Views software.

3.2. Model Specification

The specification of the VAR model is made up of three variables depicting the relationship between FDI, exports and economic growth. The VAR approach builds on the earlier work of Sims (1980) which employed an identification of the impulse response through a priori restrictions on the covariance matrix of the structural errors. This becomes useful to avoid arbitrary identifying restrictions that characteristic the unrestricted VAR. This study follows Chakraborty (2006) in examining the dynamic interaction of FDI, exports and economic growth. Therefore, the model can be specified thus;

$$RGDP_t = \alpha_0 + \sum_{i=0}^p \alpha_1 FDI_{t-1} + \sum_{i=0}^p \alpha_2 NonEXP_{t-1} + \sum_{i=0}^p \alpha_3 RGDP_{t-1} + \varepsilon_{1t} \text{-----} 1$$

$$FDI_t = \beta_0 + \sum_{i=0}^p \beta_1 FDI_{t-1} + \sum_{i=0}^p \beta_2 NonEXP_{t-1} + \sum_{i=0}^p \beta_3 RGDP_{t-1} + \varepsilon_{2t} \text{-----} 2$$

$$NonEXP_t = \gamma_0 + \sum_{i=0}^p \gamma_1 FDI_{t-1} + \sum_{i=0}^p \gamma_2 NonEXP_{t-1} + \sum_{i=0}^p \gamma_3 RGDP_{t-1} + \varepsilon_{3t} \text{-----} 3$$

RGDP denotes economic growth, FDI measures foreign direct investment inflows and Non Exp stands for non-oil exports. By estimating models 1, 2 and 3, it would give us the dynamic interaction among foreign direct investment and economic growth in Nigeria.

Meanwhile, $t = 1980 \text{-----} 2016$.

α_0, β_0 and γ_0 are intercepts and $\beta_1, \beta_2, \beta_3, \alpha_1, \alpha_2, \alpha_3, \gamma_1, \gamma_2$ and γ_3 are slope parameters.

3.3. Results and Discussion

3.3.1. Dynamic Interaction of FDI, Exports and Economic Growth in Nigeria

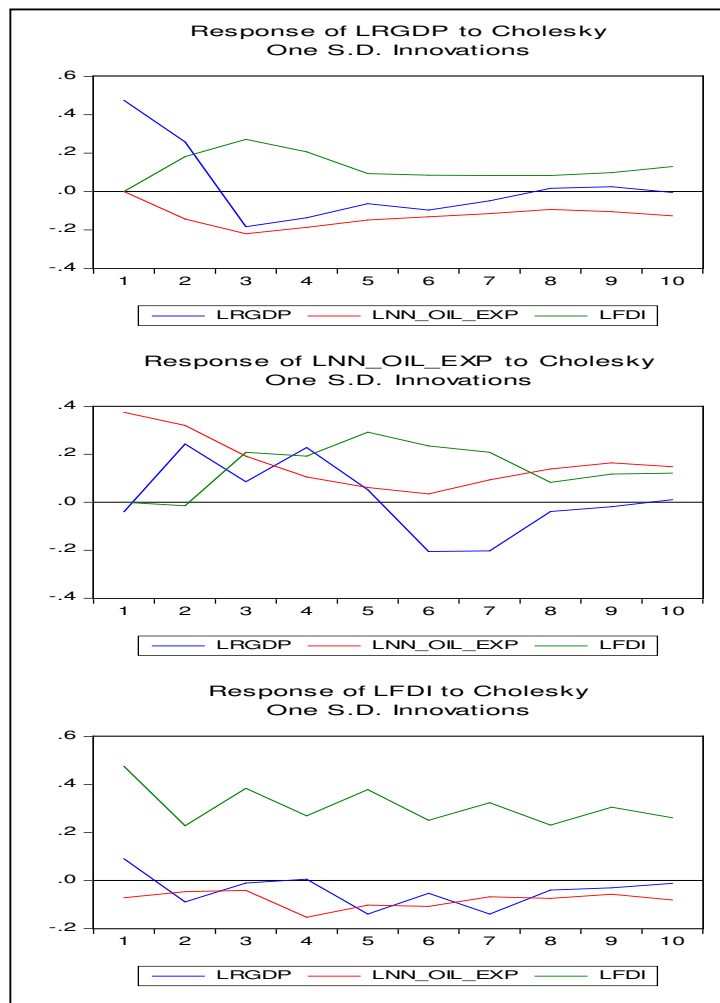


Figure 2: Impulse Response

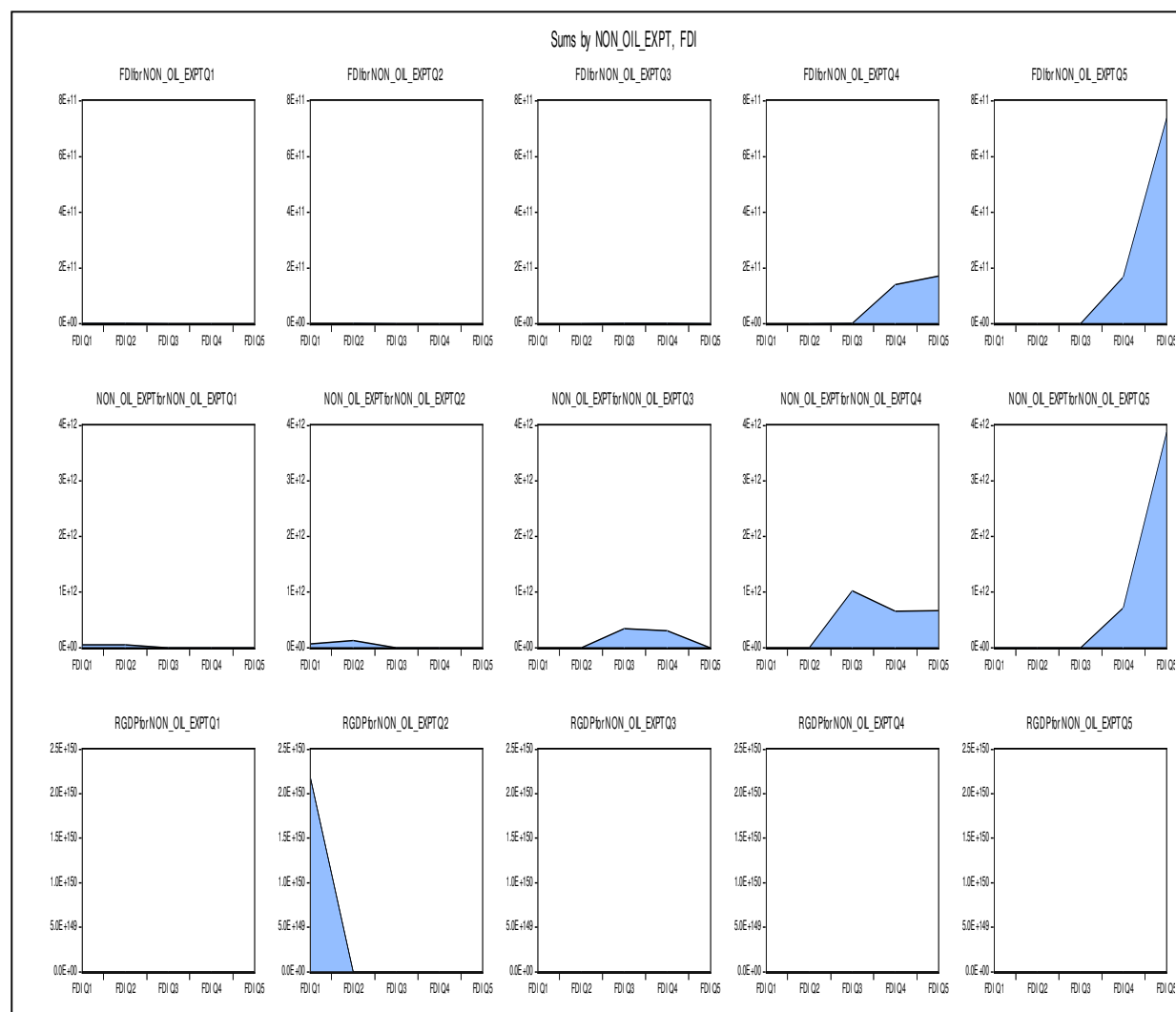


Figure 3

Source: Eview Output, 2018

The impulse response function is used in order to trace out the responsiveness of the dependent variables to shocks to each of the other variables (Pesaran and Shin, 1998). It shows the dynamic impacts of various shocks in the future and their interaction. However, the result is presented in Figure 2, it employs for ten-year horizon. We note that the FDI inflows are slumped over the forecasted period. This response is due to its own shock in which is starting to be negative for the sixth year through the end period. Also, a shock of FDI will cause a negative influence on GDP started from the first year until the end period. While for the export, FDI shock will lead to a positive impact for the first two years, and begins to be negative from the third period until the tenth year accordingly, we can say that the FDI inflows to Nigeria have an important impact on the country economy as well as level of exports. However, a shock to FDI inflows is a crucial factor that determines the level of economic growth in Nigeria. Hence, attracting more FDI could be considered a good policy towards the increase of the level of economic growth in general. More so, the figure depicts a gradual slowdown response of GDP started from the first period through the end year, this response is due to its own shock. While FDI inflows would witness a steady response begins in the first year, and then it started its declining from the second year to be negative by the fourth year through the end period; whereas export is negatively responded to a shock of GDP from the first to the fourth period. Furthermore, FDI began to be positive after fifth period forecasted until the tenth year. However, the figure infers a high linkage between GDP and exports, which implies the significant role of these exports. In other words, exports are still remaining as a major factor of economic growth in Nigeria, if well harnessed. In the Figure we see that the downward of exports is because of its own shock. And the GDP has faced a slight dropping over the forecasted period. However, the two responses are almost correspondent. This asserts that the exports have a direct impact on the level of GDP. Furthermore, we noted that the FDI inflows have witnessed a sharp decline for the first two years, and then begins to be increased from the third through the end period. This implies that with a low level of exports, the FDI is significantly needed in future. In other words, sustaining level of exports is highly linked to foreign companies which have advanced technologies for maintaining industry in Nigeria.

Period	S.E.	LRGDP	LEXP	LFDI
1	0.474849	100.0000	0.000000	0.000000
2	0.587748	84.47718	6.038849	9.483969
3	0.708196	64.92648	13.85535	21.21817
4	0.773396	57.63915	17.50548	24.85537
5	0.795628	55.11524	20.04249	24.84227
6	0.816662	53.72189	21.64957	24.62854
7	0.830281	52.31927	22.87855	24.80218
8	0.839800	51.17846	23.61039	25.21115
9	0.852359	49.76706	24.45685	25.77610
10	0.871308	47.62980	25.52543	26.84478

Table 2: Variance Decomposition of LRGDP

Period	S.E.	LRGDP	LEXP	LFDI
1	0.377917	1.070199	98.92980	0.000000
2	0.552342	19.92545	80.01123	0.063322
3	0.626798	17.33618	71.56003	11.10379
4	0.702225	24.37396	59.27212	16.35392
5	0.764797	21.02246	50.62554	28.35199
6	0.826591	24.17361	43.50946	32.31694
7	0.881369	26.58731	39.41398	33.99871
8	0.896939	25.85750	40.45559	33.68691
9	0.919622	24.63571	41.66275	33.70154
10	0.939628	23.61114	42.42422	33.96464

Table 3: Variance Decomposition of LEXP

Period	S.E.	LRGDP	LEXP	LFDI
1	0.490203	3.377530	2.162315	94.46016
2	0.549784	5.376099	2.442518	92.18138
3	0.671767	3.629905	2.013333	94.35676
4	0.739665	2.998975	5.978889	91.02214
5	0.849026	5.018434	5.995464	88.98610
6	0.893531	4.898386	6.903182	88.19843
7	0.963038	6.333391	6.449809	87.21680
8	0.994074	6.112517	6.625927	87.26156
9	1.041999	5.650359	6.336067	88.01357
10	1.077285	5.298804	6.503099	88.19810

Table 4: Variance Decomposition of LFDI

Source: Eview Output, 2018

3.4. Variance Decomposition

Variance decomposition is regressed to measure the contribution of each type of shocks to the forecast error variance (Campbell, 1991). In respect of economic growth, the result obtained indicates in Table 3. It exhibits that 100 percent of economic growth variance could be interpreted by current growth in economy the first period, and the percentages are still significant over the forecasted period. Furthermore, we note that FDI has a slight gradual increase in its contribution compared to exports. However, exports variance is increased from 6.03 percent in the second period reaching to 25.52 percent in the tenth year; while FDI has achieved only 26.84 percent as a higher ratio at the end period. This result, however, ensures that the FDI inflows are linked to the Nigerian economy more than that of exports.

Table 4 illustrates that 98.92 percent of the export's variance for the first year, while FDI inflows and economic growth have contributed by only 0.00 percent and 1.07 percent respectively. This means that the shocks of exports are largely related to its own shock and slightly to GDP. We note also that the shocks of exports are starting to be reduced gradually from the first period until the end forecasting. However, this ratio has declined to 42.42 percent at the end period. While FDI shocks accounted for 33.96 percent at the end of tenth period. Meaning that, the role of FDI is a significant in comparison to exports.

In addition, table 5 represents that FDI is crucially linked to its own shocks. GDP and exports have contributed by only 3.37 and 2.16 percent respectively. This asserts that the FDI are strongly affected by other factors out of this model which could be attributed to global economic.

4. Conclusion and Recommendation

This study has examined the stochastic behavior of FDI, exports and economic growth in Nigeria over the period of 1980 to 2016 using impulse response and variance decomposition. The results of the interaction between FDI, exports and economic growth show: that an innovation on FDI produces a positive shock effect on economic growth which later

dies off after the sixth year and becomes negative throughout the end period. Meanwhile, a shock of FDI causes a negative influence on economic growth at the initial period until the end of the period. Conversely for the exports and FDI shocks will generate a positive impact for the first two years but this positive response reduces over time. The shock of exports is largely related to its own shock and slightly to GDP. We note also that the shocks of exports are starting to be reduced gradually from the first period until the end forecasting. However, this ratio has declined to 42.42 percent at the end period. While FDI shocks accounted for 33.96 percent at the end of tenth period.

Finally, it is worth noting that policy shocks to FDI, exports, and economic growth in Nigeria do not show immediate responses in the desired direction. Therefore, policy makers should as a matter of fact bear it in mind the time lag it involves in order to ensure appropriateness in the timing of policies in this regard.

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