Foreign Direct Investment (FDI) Inflow and Insecurity in Nigeria: An Empirical Analysis

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ABSTRACT

This paper empirically examines the impact of defence and security on foreign direct investment (FDI) in Nigeria using quarterly historical data covering the period of 1994q1-2019q4 and an ARDL and VAR econometric techniques are adopted as tools of data analysis. The results from both econometric approaches revealed that foreign direct investment responds negatively to the exogenous occurrence of security threats both in the short and long runs. Also, economic instability and uncertainty are shown to cause drag in foreign direct investment inflow in Nigeria. This study further shows that economic liberalization, proxy with trade openness, and economic progress, proxy with the growth of gross domestic product per capita contribute immensely to the flow of foreign direct investment into Nigeria. The study recommendations drawn from the findings are that national security challenges should be addressed without delay by the government at all the tiers levels to change the course of the downward trend of FDI in Nigeria; establish risk adverting policy to reduce economic uncertainty; promote price stability policy to reduce economic instability; diversifying the economy to further increase economic progress which greatly drives FDI inflow, and encourage economic liberalization which brings benefit through market expansion.

1. INTRODUCTION

The classical theory of economic growth showed that the accumulation of sufficient domestic savings is required to drive investment which later translates to growth. However, when the home country could not by itself provide sufficient savings for productive domestic investment, hence, there is a need for foreign saving augmentation. This is the basis of the renowned two-gap theory of Chenery and Strout (1966). Unarguably, globalization policy through commercial trade openness will therefore give room for FDI inflow into the country. According to Adeleke (2010), FDI includes investments in actual resources, which include physical assets such as industrial plants, land, capital items, businesses, and inventories.

FDI is also seen as a driver of development since it provides much-needed cash for investment, increases competitiveness in host-country businesses, and aids local firms in becoming more profitable by obtaining more product innovation or investing in both human and physical capital (Ajayi, 2006). However, apart from the globalization policy, the economic and political structures of the home economy need to be convincing enough to attract meaningful FDI into the country. The success of both the political and economic structure of a country centres on a strong security system, both internally and externally. Also, the environment in which a business operates is a major determinant of its success and survival, as well as the host country's overall growth. Investors seek to set the business up in tranquil, progressive settings where they may do business without the dangers of insecurity, insurrection, or violence.

Recently, killings, kidnappings, frequent riots, and corruption have been on-the-rise issues be devilling the country, Nigeria, and has posed serious challenges and threats to the security, peace and stability of the country. The 2021 Global Peace Index (GPI) has ranked Nigeria 146 among 163 independent nations and territories, according to its level of peacefulness. Nigeria moved one step from 147 in 2020, though it still ranked eighth among the least peaceful countries in Africa after South Sudan, Somalia, the Democratic Republic of the Congo, Libya, Central African Republic, Sudan and Mali (GPI, 2021). The report further revealed that Nigeria continues to experience challenges in the areas of safety and security, as well as an ongoing conflict. In the Northeast, the fighting between government troops and Boko Haram resulted in an estimated 1,606 deaths in 125 deadly occurrences in 2020, averaging 13 deaths per violent event in the Boko Haram insurgency (GPI, 2021).

Various domestic problems engineered by the insurgency and insecurity in Nigeria; loss of innocent lives, investments and properties, occupation displacement, had caused various firms both domestic, foreign and potentials to move their investments out of the country. According to Awortu (2015), the Boko Haram insurgency in Northern Nigeria has caused people to abandon their businesses, as well as the shutdown of banks and government parastatals. The country's insurgency has resulted in a decline in business performance as well as increased investor apathy, resulting in a low inflow of foreign direct investment (FDI). It is pathetic that despite many government campaigns to encourage foreign investors, the country's level of foreign direct investment continues to drop at an alarming rate. According to Adebayo (2014), any country attempting to grow must reduce crime to the minimal minimum.

It is of importance to empirically show the weight of evil that has befallen the inflows of the FDI in Nigerian economy and this study is therefore carried out with a special emphasis on the impact of rising security concerns on foreign direct investment in order to boost the country's economic growth and development. However, in Nigeria, few studies have been done on this area and too few studies have been carried out empirically (Oriakhi & Osemwengie, 2012) and none adopted dynamic econometric technique(s) to examine the underlying dynamics effects of insecurity. This study adopts ARDL and VAR econometric techniques to uncover both the short and long-run impact of the rising insecurity on the foreign direct investment inflow in the Nigerian economy.

2. Literature review

Unfortunately, very few studies have been carried out on this study matter in Nigeria and the available ones were no of recent. This makes this study to be recent and add to the existing works of literature. Enders and Sandler (1996) analyzed the losses in net foreign direct investment (NFDI) due to terrorism in Spain and Greece. Using a sample period from 1968 to 1991 to estimate ARIMA with transfer function for Spain VAR for Greece, they found in their study that annual NFDI is reduced in Spain by 13.5% while that of Greece is reduced by 11.9%. Bandyopadhyay, Sandler, and Younas (2011) used a system-GMM estimator to analyze the impact of terrorism on FDI/GDP in 78 developing countries from 1984 to 2008, using a dynamic panel with eight three-year averages of all variables. Domestic terrorism, they find, has a negative and substantial impact on FDI as a percentage of GDP.

Given the usual environment of insecurity and terrorism, this means that much-needed development resources may be eroded and displaced. Oriakhi and Osemwengie (2012) examined the impact of national security on foreign direct investment in Nigeria. Their study used historical data on foreign direct investment, security and defence vote, and real GDP from 1980 to 2009 and employed a multiple regression model as a tool of data analysis. Their study showed a negative impact of poor national security on foreign direct investment in Nigeria. Adesegun and Olumide (2015) investigated the impact of insecurity on foreign direct investment in Nigeria. Using time-series data on foreign direct investment, security and defence vote, and real GDP from 2003 to 2012, they estimated a multiple regression model. Their study showed that insecurity, proxy with vote on security and defence, impacted negatively foreign direct investment inflow in Nigeria. Jelilov, Ozden, and Briggs (2018) investigated the impact of insecurity on investment in Nigeria. Their study used data on Nigeria Terrorism Index as a proxy for insecurity, Foreign Direct Investment Inflow, oil prices, and real GDP from 2007 to 2017 to estimate a multiple regression model. Their study concluded that Nigeria's insecurity level due to terrorist activities have a significant negative effect on the growth of economic investment.

3. METHODOLOGY

This study adopts with modification the model of Adesegun and Olumide (2015). In their study, FDI was expressed as a function of the vote on defence and security and gross domestic product;

$$fdi = f(vsd, gdp) \qquad (1)$$

However, the model for this study is expressed as;

$$fdiy = f(vsd, gdpk, to, ui, inf) \qquad (2)$$

Where made use, **fdiy** is the FDI per real gross domestic product, **vsd** is the vote on defence and security, **gdpk** is the GDP per capita, **to** represent the trade openness, **ui** is the macroeconomic uncertainty index, and **inf** is the inflation rate. Since national security cannot be quantified and

following Oriakhi and Osemwengie (2012), and Adesegun and Olumide (2015), this study uses votes on defence and security as a proxy for national security.

Furthermore, the government's security spending pattern shows the level of security in place as well as the government's assessment of the importance of security concerns in Nigeria, especially if the spending pattern is effective (Otto & Ukpere, 2012). The inclusion of trade openness is to capture the effect of globalization on the FDI. Also, the uncertainty index is included in the model since uncertainty from different sources can discourage foreign potential investors. The inclusion of the inflation rate is to control the effect of economic instability on foreign direct investment. Data on FDI per real gross domestic product, GDP per capita growth, trade openness, and inflation rate are sourced from the World Bank Development Index (WDI) database. Vote on defence and security data is sourced from the Central Bank of Nigeria (CBN) data catalogue and that of macroeconomic uncertainty index is sourced from the Economic Policy Uncertainty (EPI) website. The data covered the period of 1994q1-2019q4. The data from the EPI website is available quarterly, hence the Chow-Lin method is used to convert the other variables data into quarterly frequency.

ARDL Model

To parametrically estimate equation 2 above, an ARDL model below is specified as;

$$fdiy_t = \partial_0 + \sum_{i=1}^{l} \partial_{1i}\, fdiy_{t-i} + \sum_{i=0}^{m} \partial_{2i}\, vsd_{t-i} + \sum_{i=0}^{n} \partial_{3i}\, gdpk_{t-i} + \sum_{i=0}^{o} \partial_{4i}\, to_{t-i}$$
$$+ \sum_{i=0}^{p} \partial_{5i}\, ui_{t-i} + \sum_{i=0}^{q} \partial_{6i}\, inf_{t-i} + u_t \qquad (3)$$

The $\partial's$ are the parameters to be estimated and the lags are optimally selected using the statistical information criteria. The u_t is the shock variable which is assumed to be white noise in nature.

The VAR Model

The Vector AutoRegressive (VAR) framework is generally focused on how the innovations to one endogenous variable affect other endogenous variables included in the model (Effiong, 2013). Specifically, the justification for using the Vector AutoRegressive (VAR) is to examine the transmission of unexpected shocks from insecurity to Nigeria FDI inflow and robustly check the ARDL model result. The general algebraic VAR representation is described thus:

$$Y_t = C + \sum_{i=1}^{i=4} D_i Y_{t-i} + v_t \qquad\qquad v_t \sim N(0, D) \qquad (4)$$

The uppercase alphabet $Y_t = \{fdiy_t, vsd_t, gdpk_t, to_t, ui_t, inf_t\}$ is a vector of variables; matrix C contains the constant parameters; matrix D is the lag matrix that controls the underlying dynamics embedded in the model, and the last is the shocks v_t. The shock is normally distributed with zero mean and variance D. The matrix D is the shocks covariance matrix which is correlated. However, the generalized impulse response is computed instead of using the Cholesky decomposition of the covariance matrix which is mostly affected by the arrangement of variables in the VAR model. To

generalized impulse response is consistent irrespective of the arrangement of variables in the model (Pesaran & Shin, 1998).

4. FINDINGS AND DISCUSSION

Table 1: descriptive statistics and pairwise correlation matrix

	fdiy	vsd	gddpk	to	ui	inf
Mean	1.554	0.047	2.073	37.784	0.102	16.054
Max	6.523	0.541	13.639	54.320	0.256	78.059
Min	0.022	-0.376	-4.609	19.266	0.002	4.289
Std. Dev.	1.029	0.123	3.611	9.144	0.065	15.095
fdiy	1					
vsd	-0.258***	1				
gddpk	0.180*	-0.049	1			
to	0.050	0.030	0.351***	1		
ui	-0.108	0.031	-0.303***	-0.275***	1	
inf	0.206**	0.090	-0.363***	-0.131	0.274***	1

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 1 depicts the descriptive statistics and the correlation table for the variables used in this study. The mean statistics show that the average value of all the variables is positive. The minimum and maximum values show that the rate of FDI per GDP frankly increased between the 1990s and the 2000s, but the mean value shows that the average value is very low compared with the maximum value. Also, between 1994 and 2019, the least decline in real gross domestic product per capita growth and growth in security and defence vote is about 4.609% and 0.376%. Trade openness has been increasing over the years has suggested by the minimum and maximum statistics. The maximum value of the uncertainty index is almost twice its mean value suggesting the high degree of uncertainty the Nigerian economy harbours.

It is no doubt that the inflation rate in Nigeria is skyrocketing in nature; the mean value shows that the rate of inflation between the 19s and 20s jumped from the single-digit to double-digit figure. The standard deviation statistics reveals that the degree of variation in inflation is very high; it has a value of about 15.1 which is about five times that of GDP per capita growth. The correlation matrix shows that only the pairwise correlations between inflation rate, GDP per capita, and security and defence vote, and FDI per GDP is statistically significant. The correlation figure already suggests a negative relationship between security and defence vote and FDI per GDP. One interesting fact from the table is that none of the variables pairs wisely correlated with security and defence vote; the implication of this is that there is a high degree of no multicollinearity among the independent variables.

Table 2: Phillips-Perron unit root test result

variable	c		c & t		no c & t		remark
	t-Stat.	Prob.	t-Stat.	Prob.	t-Stat.	Prob.	
fdiy	-4.873	0.000***	-4.642	0.002***	-3.680	0.000***	I(0)
vsd	-3.607	0.007***	-3.668	0.029**	-3.592	0.000***	I(0)
gdpk	-2.358	0.156	-2.223	0.472	-1.935	0.051*	I(0)
to	-2.695	0.078**	-2.996	0.138	-0.433	0.525	I(0)
ui	-3.196	0.023**	-3.459	0.049*	-1.180	0.216	I(0)
inf	-2.507	0.117	-2.388	0.384	-2.176	0.029**	I(0)

*** p < 0.01; ** p < 0.05; * p < 0.1
Note: c (constant), t(trend)

Table 2 depicts the unit root test result for the variables. Three different assumptions are taken into account while conducting the test. The first assumption is that only constant is present in the variables. Under this assumption, the result shows that FDI per real GDP, security and defence vote, trade openness, and uncertainty index are stationary. The second assumption assumed both trend and constant to be present in the data generating process of the variables. The result under this assumption shows that FDI per real GDP, security and defence vote, and uncertainty index are stationary. Lastly, the result of the assumption that both constant and trend are absent from the data shows that FDI per real GDP, security and defence vote, real GDP per capita, and inflation rate are stationary. Conclusively, it can be conferred that the variables are stationary but under the different assumptions of the data generating process. The stationary nature of the variables implies that they are not cointegrated variables and the test for cointegrated is avoided in this study. This justifies the implementation of the stationary ARDL model and the VAR model. Nevertheless, stationary of variables in a single equation model suggest that long-run inflation may likely be present in the variables but no permanent shocks.

Table 3: ARDL regression result
Dependent variable: foreign direct investment per GDP (fdiy)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
vsd_t	-3.493927	1.793283	-1.948341	0.0544*
$gdpk_t$	0.161710	0.071415	2.264370	0.0259**
to_t	-0.168744	0.027653	-6.102195	0.0000***
ui_t	-44.54312	9.171010	-4.856948	0.0000***
inf_t	-0.236854	0.076455	-3.097953	0.0026***
Δvsd_t	-0.335877	0.102755	-3.268717	0.0015***
$\Delta gdpk_t$	-0.085848	0.023258	-3.691077	0.0004***
Δto_t	-0.029775	0.008398	-3.545631	0.0006***
Δui_t	-1.732263	0.357874	-4.840432	0.0000***
Δinf_t	-0.054016	0.008222	-6.569954	0.0000***
ecm_{t-1}	-0.038890	0.003730	-10.42580	0.0000***

| c | 0.557125 | 0.063700 | 8.746136 | 0.0000*** |

*** p < 0.01; ** p < 0.05; * p < 0.1

Tables 3 shows the estimated result for the ARDL (1, 0, 1, 1, 0, 1) model automatically selected by the Akaike information criterion. The variables in level are the long-run variables and the ones with changes (Δ) as prefixes are the short-run variables. It can be deduced from the result that the coefficient of security and defence is negative and significant both in the short and long run. This corroborates with the studies of Enders & Sandler (1996); Bandyopadhyay et al., (2011); Oriakhi & Osemwengie (2012); Adesegun & Olumide (2015); Jelilov et al., (2018), although, they could not distinguish between the short and long-run effect. Further, it can be deduced from the result that the negative impact of insecurity, in the long run, is about twenty-five times of the short run. In line with the theory, rising domestic output per head is a good determinant of foreign direct investment inflow into the country.

However, this study provides counterintuitive evidence of the impact of gdp per capita on foreign direct investment in Nigeria in the short run. This is not in line with the studies of Oriakhi & Osemwengie (2012); Adesegun & Olumide (2015). This result might imply that foreign desperadoes might use the privilege of a friendly international trading scheme to exploit the local resources which will adversely affect the domestic output growth and economic development. However, the long-run result conforms to the theory by showing that an increase in the rate of real per capita GDP brings about a 0.16% units average increase in foreign direct investment per output.

Trade openness which proxy economic liberalism is shown to negatively impact foreign direct investment per output in Nigeria both in the short and long run. This has been suggested by the short-run impact of real per capita GDP in the short run. This negative relationship is still reflecting the true intent of most foreign firms; their main motive is to exploit the black nations making abnormal profit through transfer pricing. Further, the result shows that the coefficients of the uncertainty index and the inflation rate are negative and significant both in the short and long runs. This suggests that the higher the degree is uncertainty in the economy, the higher the number of foreign investors discouraged, hence the lesser the inflow of foreign direct investment. Likewise, the higher the rate of inflation which proxy economic instability, the higher the number of discouraged potential investors, hence the lesser the expansion of the market both domestically and internationally.

The error correction terms imply that about 3.9% of disequilibrium in foreign direct investment per real GDP is corrected within four quarters after exogenous shock in the economy. The evolution of the dynamic impact of the independent variables in the ARDL model on the dependent variable is revealed in Figure 1. It can be seen that the immediate and overtime impacts of unexpected social upheavals on foreign direct investment per GDP are negative. The immediate impact of per capita real GDP growth on foreign direct investment per GDP is negative, but switches to positive over time. Trade openness, macroeconomic uncertainty, and inflation rate significantly caused a drag on foreign direct investment per GDP as depicted in the last three figures in Figure 1.
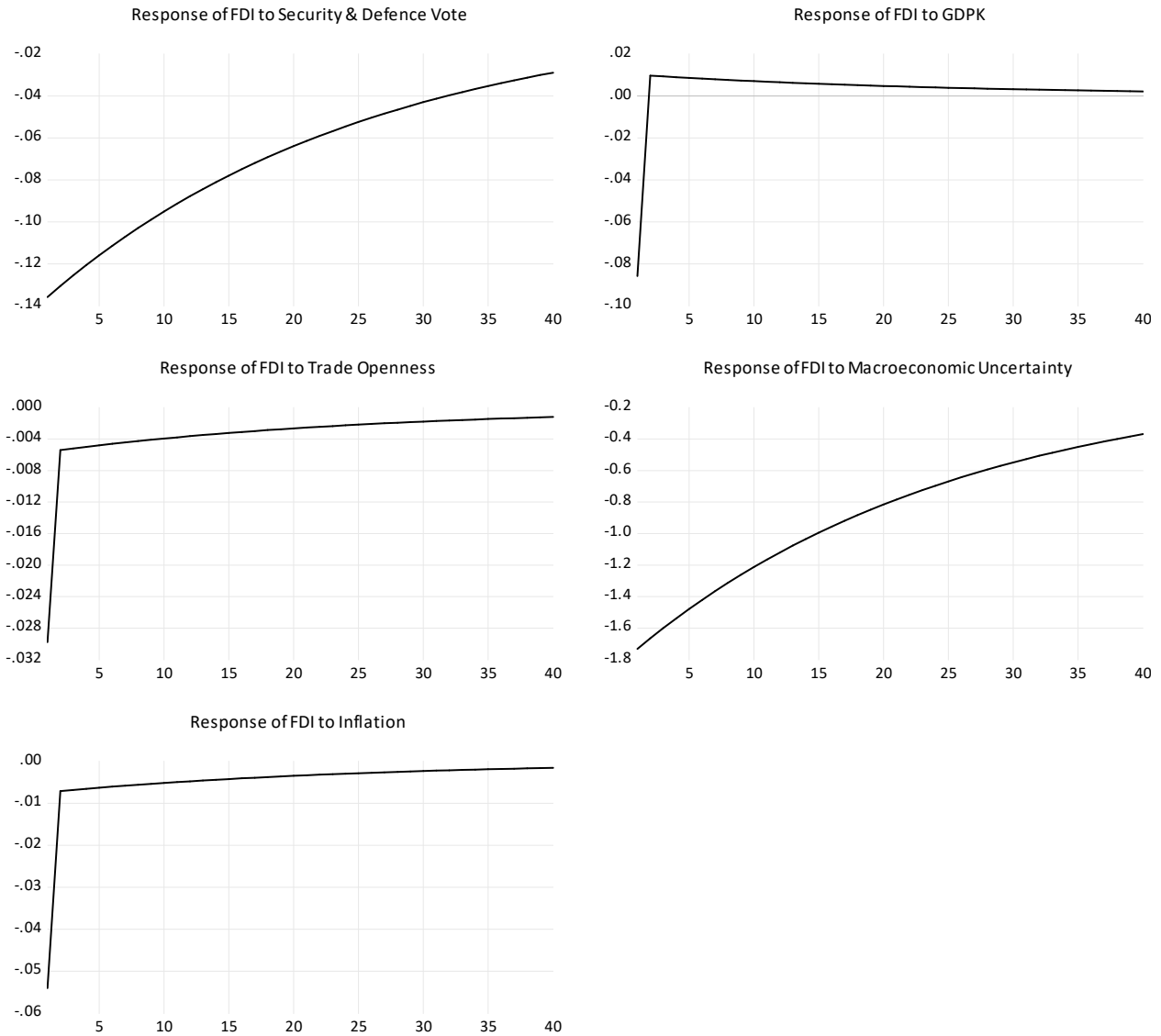
Figure 1: Response of Foreign Direct Investment To Independent Variables Shock

Figure 2 depicts the VAR impulse response function showing how foreign direct investment per GDP responds to shocks in the other variables in the system. The simultaneous involvements of the variables in the process allow us to justify the findings from the estimated ARDL model. It can be seen just like in the estimated ARDL result, foreign direct investment per GDP respond negatively to the immediate exogenous rise in insecurity. However, the effect is positive in the medium-run, but later switches back to negative in the 15th period and takes about 40 quarters for the effect to die off. This is a very lasting effect. Also, the immediate effect of aggregate supply shock to GDP per capita is negative but just for the first quarter.

Likely due to the necessary adoption of macroeconomic policies, the effect becomes positive in the second quarter and reaches the peak around seven quarter and gradually declining before dying off around forty quarters. The response of foreign direct investment per GDP to the external shock to trade openness is negative on the impact but switch in the tenth quarter. Unlike in the ARDL model result, there is a positive persistent effect of a shock to trade openness on foreign direct investment per GDP. The same result holds for the impact of economic uncertainty on foreign direct investment per GDP; it can be deduced from the figure that foreign direct investment per GDP responds negatively throughout to shock to macroeconomic uncertainty. Lastly, foreign direct investment per GDP responds negatively to the aggregate demand shock to inflation on the impact. However, over time, the impact of inflation shock on foreign direct investment per GDP is positive but insignificantly. This is suggesting that moderate inflation is an inducing factor to encourage the producer to produce and also encourage skilled works.
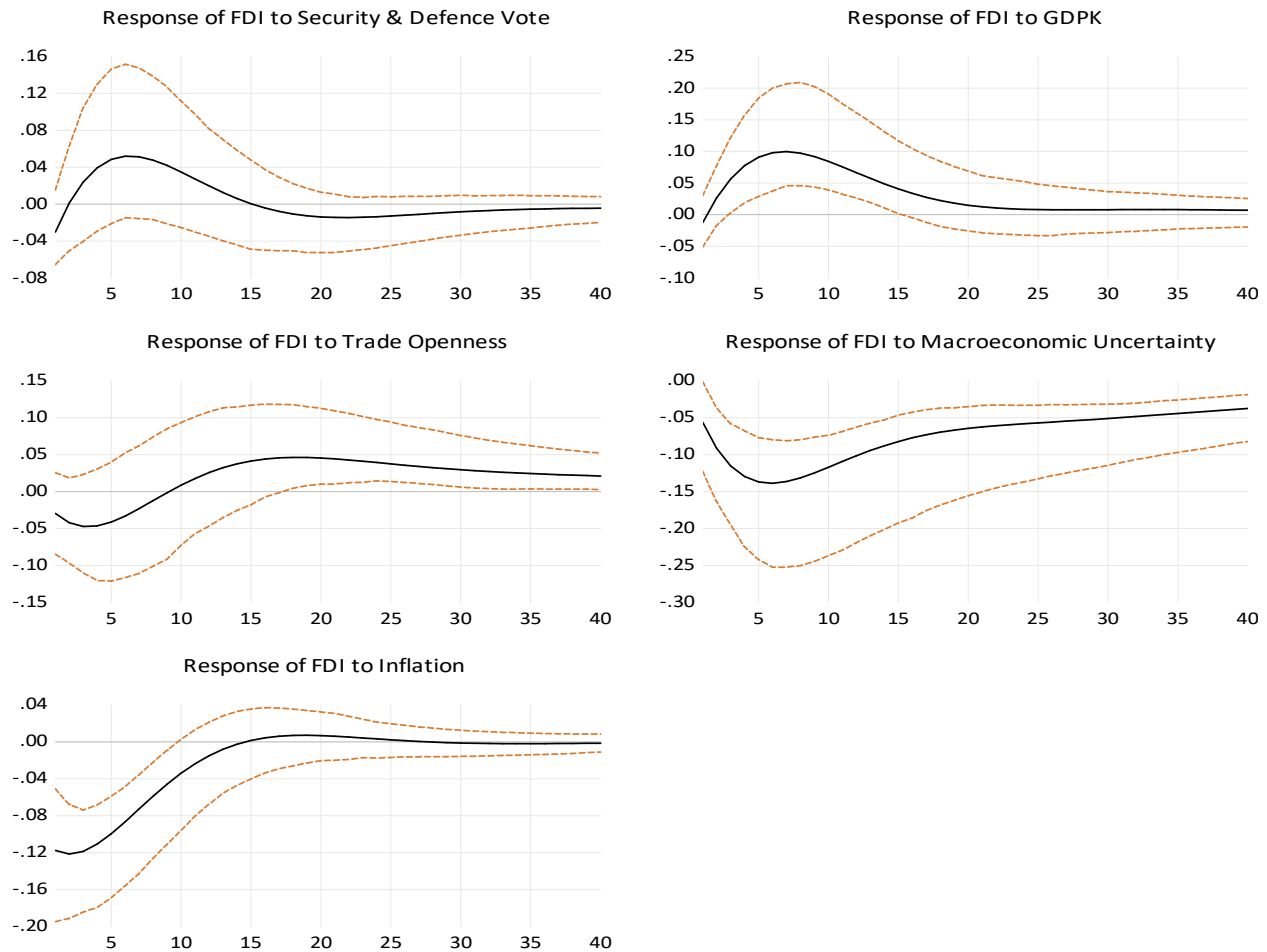

Figure 2: Response to Generalized One S.D. Innovations with 95% confidence interval using Hall's percentile bootstrap with 999 bootstrap replications.

5. CONCLUSION AND RECOMMENDATIONS

Using dynamic econometric techniques, this study empirically examined how poor security and defence can hamper the inflow of foreign direct investment in the case of the Nigerian economy. Based on the results, it is observed that the inflow of foreign direct investment in Nigeria is discouraged by insecurity; given that foreign direct investment is a major source of savings for developing countries like Nigeria, as well as a development engine, the link between insecurity and foreign direct investment is a major subject of concern. Also, an increase in the rate of domestic income is a significant determinant to encourage the inflow of foreign direct investment in Nigeria economy. Trade openness doesn't seem to promote foreign direct investment inflow in Nigeria in the short–run but in the long run. Macroeconomic uncertainty and economic instability are negative factors towards the inflow of foreign direct investment in Nigeria.

The study recommended that national security challenges should be addressed proactively by the government at all levels to reverse the downward trend in FDI inflows. Also, the government and its agents in charge of allocating security funds should make certain that security and defence votes are effectively allocated and used for the purposes for which they were intended in order to bring them up to international standards. There is a need to establish risk-averting policies to reduce economic uncertainty; promote price stability policies to reduce economic instability; diversify the economy to further increase economic progress, which is a major driver of FDI inflows; and encourage economic liberalization.

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