Foreign Direct Investment and Economic Development in Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Original Research Article

ABSTRACT

This study examined the role of foreign direct investment in the economic development process of Nigeria. Specifically, the study focused on the impact of foreign direct investment on economic development, proxy by human development index (HDI). The constructed model included other factors that affect economic development such as trade openness, government expenditure and inflation. Annual data from 1990 to 2020 was used for the study and sourced from the United Nation Development Report (UNDR), United Nations Conference on Trade and Development (UNCTAD), World Development Indicator (WDI) and Central Bank of Nigeria (CBN) Statistical Bulletin. In estimating the economic development model, unit root, autoregressive distributed lag (ARDL) and Toda and Yamamoto methods were employed. The result indicated that foreign direct investment had negative and significant impact on economic development. Similar relationship was established between trade openness and economic development. These results were supported by the Toda and Yamamoto result as there was no evidence of causality relationship between foreign direct investment and economic development. To reverse this negative impact of foreign direct investment, this study recommends that basic infrastructure should be provided by the government as this will boost real sector activities and appropriately redirect foreign direct investment inflow away from extractive sector to the productive sectors of the Nigerian economy.

1. INTRODUCTION

There has been long standing debate on the most appropriate path to economic development. The need to attain economic development in Nigeria is necessitated by the desire to improve the living standard of Nigerian, build an inconclusive economy and forestall the negative consequences of underdevelopment such as increase level in insecurity, poverty and political instability. The desire to foster economic development is reflected by the various policy programmes of successive government in Nigeria which include the Transformation Agenda

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of the Goodluck Jonathan Administration and more recently the Economic Recovery Growth Plan of Muhammadu Buhari [1-3]. In achieving economic development, the Nigerian government have towed the path of employing fiscal and monetary policy to boost economic activities and help actualize economic development. This is reflected in the currency redesign policy rolled out by the CBN to boost economic development and reduce inflation rate. This is reflected in the increasing public expenditure of government which has risen over the years from N8.83 trillion in 2019 to N13.08 trillion in 2021 [4-6]. While there has been expansion in fiscal spending over the years, economic development indicators have deteriorated over the years. Unemployment level has risen from 20.4 percent in Q4 2017 to 33.3 percent in Q4 2020. The inflation level has also witnessed upward movement from 9.37 percent in November, 2015 to 20.77 percent as at September, 2022, worsening the misery level in Nigeria (NBS, 2021; CBN, 2022). The inability of increased government spending to promote economic development in Nigeria may not been unconnected to the huge saving-investment gap in Nigeria that has forestalled government developmental plans.

Face by these challenges of limited domestic resources to finance economic development, developing countries now looking to foreign inflows to fill the saving-investment gap and overcome the hurdle of insufficient resources to promote economic development [7]. The ability of foreign direct investment to fill the saving-investment gap and help accelerate economic development has been suggested by economic theory, particularly the two-gap model. This has led to the design and implementation of external policies by government of Nigeria to attract foreign direct investment (FDI).

Though foreign direct investment is recognized as a propeller of economic development, there are conflicting findings on how foreign direct investment affect economic development. Some past studies recognized positive relationship between foreign direct investment and economic development [8-10], other have stated that foreign direct investment negatively affect economic development [11,12]. This study examined the role of foreign direct investment on economic development, using human development index (HDI) as measure of economic development. As an improvement over past studies, this study employed the Narayan [13] critical values in testing for cointegrating

relationship between foreign direct investment and economic development. Also, the Toda and Yamamoto causality result was employed in testing the predictive relationship between economic development, foreign direct investment, and other control variables such as trade openness, government expenditure and inflation.

The rest of the paper is structured as follows. Issues in the literature were discussed in Section 2. Section 3 captures the methodology utilized for this study. The results are presented in Section 4 and Section 5 contains the summary and recommendation.

2. ISSUES IN LITERATURE

Alabi [8] used the ordinary least squares (OLS) method to show that foreign direct investment has positive and significant effect on economic growth in Nigeria. The study which used data from 1986 to 2017 also identified currency depreciation as a driver of economic growth and development in Nigeria.

Uwubanmwen and Ogiemudia [9] noted that effect of foreign direct investment on economic growth in the short run is both immediate and has time lag. These effects they found out are positive and significant. In the long run, the analysis of the data from 1979 to 2013 based on the ordinary least square (OLS) method, indicated that foreign direct investment is an insignificant driver of long run economic growth in Nigeria.

Okonkwo, Egbunike and Udeh [14] who used the ordinary least square (OLS) method to analyse Nigerian data from 1990 to 2012 reported that foreign direct investment has positive and insignificant effect on economic growth. Güngör and Ringim [10] examined the relationship between foreign direct investment, domestic investment and economic growth in Nigeria in the vector error correction (VEC) framework. Using annual data for the period of 1980 to 2015, they found uni-directional causality that runs from foreign direct investment to economic growth, indicating that foreign direct investment inflows is a driver of economic growth in Nigeria.

Aust, Morais and Pinto [15] in a panel of 44 African countries for the period of 1990 to 2018, examined the role of foreign direct investment in achieving sustainable development goals. Using an ordered probit method, the result showed that

increased foreign direct investment inflows is critical in achieving SDGs. They noted that FDI inflows positively impact on renewable energy, infrastructure, sanitation and clean water in the host countries.

Osunkwo [16] analysis using the ordinary least square (OLS) method informed that foreign direct investment has an elastic positive and significant impact on economic growth in Nigeria. The conclusion was based on data covering from 1980 to 2018.

Okwu, Oseni and Obiakor [7] showed using data of 30 leading global economies from 1998 to 2017 that foreign direct investment inflow is a significant driver of economic growth. Their pooled ordinary least square method showed that investment enhances economic growth, while economic growth declines as credit to the private sector and domestic inflation increases.

Babalola, Mohd, Ehigiamusoe and Onikola [17] found that foreign direct investment, trade and aid significantly enhance economic growth. They showed evidence of short run causality running from foreign direct investment to economic growth in Nigeria. These conclusions were based on the use of the autoregressive distributed lag (ARDL) to analyse data that spanned from 1980 to 2015.

In Vietnam, Nguyen (2020) who used data from 2000 to 2018 found that foreign direct investment significantly contributes to the growth of the Vietnamese economy. The ordinary least square (OLS) results also revealed that trade, particularly export, enhances long run economic growth.

Using annual data that spanned from 1972 to 2013, Gökmenoğlu, Apinran and Taşpınar [18] employed the dynamic ordinary least square (DOLS) and Toda and Yamamoto causality methods to assess the relationship between foreign direct investment and economic development in Nigeria. With economic development proxy using life expectancy, secondary school enrolment and gross national income (GNI), the DOLS revealed that foreign direct investment had positive and significant effect on secondary school enrolment and GNI. Furthermore, life expectancy declines with increased FDI inflows into Nigeria.

In understanding the linkage between foreign direct investment and economic growth in Nigeria, Giwa, George, Okodua and Adediran [19] employed data from 1981 to 2017 and the model constructed was estimated using the generalized method of moments (GMM). The GMM result displayed negative and significant relationship between capital intensity and economic growth.

3. DATA AND METHODOLOGY

For this study, our data was sourced from the United Nation Development Report (UNDR), United Nations Conference on Trade and Development (UNCTAD), World Development Indicator (WDI) and Central Bank of Nigeria (CBN) Statistical Bulletin, covering from 1990 to 2020. Economic development which is our dependent variable was proxy using human development index (HDI). The predictor variables are foreign direct investment (inflows as percentage of GDP), government expenditure (government final expenditure as percentage of GDP), trade openness (sum of export and import as percentage of GDP) and inflation (change in consumer price index). We obtained data on human development index (HDI) from UNDR; government expenditure (GE) and trade openness (TOP) from WDI; foreign direct investment (FDI) from UNCTAD and inflation (INF) from CBN.

In analysing the data, we started off with the descriptive statistics where we computed mean values, range, standard deviation and normality statistics for all five series. The second step taken was identifying the stationarity status of the series. The primary methods used were the augmented Dickey-Fuller (ADF) and Kwiatkowski, Phillips, Schmidt and Shin (KPSS) [20] tests. The issue of low power motivated the adoption of the KPSS test to complement the ADF results [21]. Before proceeding to estimating the model, we ensured that the condition of cointegration is fulfilled as some of the series are non-stationary. We checked for cointegration differently from previous studies, using the critical values furnished by Narayan [13] over those of Pesaran, et al. [22]. This is because, the unrestricted and no trend critical values of Pesaran, et al. [22] relates to sample size of 1000 observations and as Narayan [13] has shown, there is significant different between the critical values for small sample size and those of Pesaran, et al. [22].

The estimation of the model was carried out using the autoregressive distributed lag (ARDL)

method. This framework was chosen because of its many advantages which include its flexible nature to accommodate purely I(0) or I(1) series and I(0) and I(1) series; producing reliable results when dealing with small sample data, among others [23-25]. In achieving the objective of predictive relationship among economic development, foreign direct investment, trade openness, government expenditure and inflation, we used the Toda and Yamamoto [26] causality method. The procedure allows for causality testing irrespective of whether the series are I(0), I(1), mix-order I(0)/I(1) or even I(2). The unit root bias is avoided using this procedure which augments the $VAR(k)$ model with d_{max} (the optimum integration process) to give $VAR(k + d_{max})$ model [21,27].

Based on past studies, we express the functional form of the econometric model used for this study as:

$$HDI = f(FDI, TOP, GE, INF) \tag{1}$$

We write the econometric specification of equation (1) as:

$$HDI_t = \alpha_0 + \alpha_1 FDI_t + \alpha_2 TOP_t + \alpha_3 GE_t + \alpha_4 INF_t + \varepsilon_t \tag{2}$$

HDI represents human development index, FDI is for foreign direct investment, and TOP denote trade openness. GE show government expenditure and we used INF for inflation. Equation (2) represent the long run model. This is integrated into the short run model in order to employ the autoregressive distributed lag (ARDL) method. The model below is then derived.

$$\Delta HDI_t = \delta_0 + \sum_{j=1}^{p} \delta_2 \Delta HDI_{t-j} + \sum_{j=0}^{p} \delta_3 \Delta FDI_{t-j}$$
$$+ \sum_{j=0}^{p} \delta_4 \Delta TOP_{t-j} + \sum_{j=0}^{p} \delta_5 \Delta GE_{t-j}$$
$$+ \sum_{j=0}^{p} \delta_6 \Delta INF_{t-j} + \alpha_1 HDI_{t-1}$$
$$+ \alpha_2 FDI_{t-1} + \alpha_3 TOP_{t-1}$$
$$+ \alpha_4 GE_{t-1} + \alpha_5 INF_{t-1}$$
$$+ \varepsilon_t \tag{3}$$

Δ stands for first difference operator, δ_i are short run coefficients, α_i denotes long run coefficients and ε_t is white noise.

Assuming there are two series, HDI and FDI, the bivariate framework for causality testing following the procedures of Toda and Yamamoto [26] is given below.

$$HDI_t = \vartheta_0 + \sum_{i=1}^{k} \vartheta_{1i} HDI_{t-i} + \sum_{j=k+1}^{d_{max}} \vartheta_{2i} HDI_{t-j}$$
$$+ \sum_{i=1}^{k} \gamma_{1i} FDI_{t-i} + \sum_{j=k+1}^{d_{max}} \gamma_{2i} FDI_{t-j}$$
$$+ \epsilon_{1t} \tag{4}$$

$$FDI_t = \gamma_0 + \sum_{i=1}^{k} \gamma_{1i} FDI_{t-i} + \sum_{j=k+1}^{d_{max}} \gamma_{2i} FDI_{t-j}$$
$$+ \sum_{i=1}^{k} \vartheta_{1i} HDI_{t-i}$$
$$+ \sum_{j=k+1}^{d_{max}} \vartheta_{2i} HDI_{t-j} + \epsilon_{2t} \tag{5}$$

4. RESULTS AND DISCUSSION

In estimating the model for this study, we first describe the series used. The findings on the statistical properties are provided in Table 1. The level of prosperity in Nigeria is sub-optimal, only averaging 0.4837. The development outcome has improved to the highest of 0.5390 and deteriorated to 0.4500. This low level of economic development could emanate from low foreign capital to augment the dearth of domestic savings, high inflationary environment, reduced trade and insufficient government spending. This is reflected by other metrics. Foreign direct investment and trade openness averaged 1.9288 and 36.8902 percent of gross domestic product (GDP) respectively. Things cost more in Nigeria as inflation averaged 18.06 percent, soaring to 72.84 percent from the lowest of 5.38 percent while the mean value of government spending is 4.43 percent of GDP, ranging from 0.91 percent to 9.44 percent.

4.1 Stationarity Test

Second, we check the level at which the series are stationary. This was done using the augmented Dickey-Fuller (ADF) test and the procedure developed by Kwiatkowski, Phillips, Schmidt and Shin [20], the KPSS test. We establish the following from the unit root results of Table 2. The index of economic development (human development index), foreign direct investment and government expenditure are not level stationary, but are in first difference. Trade

openness and inflation attained stationary in first difference based on the ADF test. However, these series (TOP and INF) are level stationary when the KPSS procedure was applied [28-31]. As the KPSS is superior to the ADF test in terms of power, this study concluded that the series are level and first difference stationary and as a result, we tested for cointegration using the Pesaran, et al. [22] ARDL bound test. The advantage of this procedure has been documented in the literature ranging from appropriateness for small sample to its less restrictive nature as it can be applied for purely I(0), purely I(1) or I(0)/I(1) series [23,22,24,25].

4.2 Test for Cointegration

Here we used the bound test in identifying if the series human development index, foreign direct investment, trade openness, government expenditure and inflation are co-moving. We report the result in Table 3. For the bound test, the F-statistics is compared with the I(1) series

Table 1. Descriptive Statistics

	HDI	FDI	GE	TOP	INF
Mean	0.4837	1.9288	4.4329	36.8902	18.0635
Median	0.4680	1.9835	4.5445	37.0216	12.2200
Maximum	0.5390	4.6207	9.4483	53.2779	72.8400
Minimum	0.4500	0.1837	0.9112	20.7225	5.3800
Std. Dev.	0.0297	1.0252	3.0601	8.6757	16.6473
Skewness	0.7432	0.5269	0.3114	0.0050	2.1305
Kurtosis	1.9523	3.3350	1.6061	2.3982	6.4085
Jarque-Bera	4.2721	1.5797	3.0107	0.4678	38.4584
Probability	0.1181	0.4539	0.2219	0.7914	0.0000
Observations	31	31	31	31	31

Source: Authors' computation (2022)

Table 2. Result of unit root test

Variables	Part I: ADF			Part II: KPSS			Remark I(d)
	Level	1st Diff.	C-Value	Level	1st Diff.	C-Value	
hdi_t	0.5889	-5.2903***	-2.9639	0.6401	0.3360**	0.4630	I(1)
fdi_t	-1.9783	-8.3196***	-2.9639	0.4985	0.1545***	0.4630	I(1)
top_t	-2.9585	-5.1751***	-2.9639	0.2605**	-	0.4630	I(0)
ge_t	-0.9799	-4.6932***	-2.9639	0.5140	0.0785***	0.4630	I(1)
inf_t	-2.0684	-4.4536***	-2.9639	0.3325**	-	0.4630	I(0)

*Note: C-Value = test critical value at 5%; *, ** and *** denote significance at 10%, 5% and 1% level, respectively for ADF and KPSS*
Source: Author computation

Table 3. Bound test result

Model		F-statistics
$F_{HDI}(hdi/fdi, top, ge, inf)$		4.774020**
	K = 4	
Narayan (2004) Critical Values	I(0)	I(1)
1%	4.320	5.785
5%	3.033	4.188
10%	2.518	3.513
Pesaran, et al., (2001) Critical Values	I(0)	I(1)
1%	3.29	4.37
5%	2.56	3.49
10%	2.2	3.09

Note: *Null hypothesis: No level relationship; K = number of regressors; *, ** and *** denote significance at 10%, 5% and 1% level, respectively.*
Source: Author's computation

critical value and if the F-statistics is higher than I(1) critical value, cointegration is favoured. We used the unrestricted intercept and no trend critical values recomputed by Narayan [13] and not those of Pesaran, et al. [22] for long run equilibrium check as the latter's critical values were basically for sample size of 1000 observations. As observed from Table 3, the F-statistics of 4.774020 is higher than 4.188 (the critical value at 5 percent). Hence, we validate cointegration among human development index, foreign direct investment, trade openness, government expenditure and inflation.

4.3 Model Estimation

The long run and short run coefficients were estimated using the autoregressive distributed lag (ARDL) method. Table 4 divulges that improvement in foreign direct investment significantly deaccelerate economic development in Nigeria. In terms of degree to which this happens, we observed that economic development decline by 0.0252 percent for every one percent increase in foreign direct investment. What can be drawn from this is that, increase in FDI has been harmful to economic development and this is not unconnected to the sector that is a major recipient of these FDI inflow – the extractive industry, a sector notorious for environmental degradation and less value addition. The harmful effect of increased FDI inflows on economic development was also noticeable in the short run. We equally observed

that more trade openness is harmful to the economic development of Nigeria in the long run. Every one percent openness of the Nigerian economy reduces economic development by 0.0010% approximately. Our finding contradicts the conventional classical trade theories which posits that trade openness could drive economic growth and development. This negative effect of trade openness on economic development was also obtainable in the short run. Our result agrees with Keynesian argument and past studies that government spending accelerates economic development. Our result precisely shows that every one percent increase in government expenditure, as a percentage of GDP, increases economic development by 0.0053%. We observe striking result concerning how inflation relates with economic development in the long run and short run. Theory suggests that inflation has detrimental effect on economic development [32]. Our result counters this as inflation accelerate economic development significantly in the long run. Economic development improves by 0.0006% for each one percent increase in general price level. Our short run analysis agrees with economic theory as we noted that economic development can only be achieved when there is reduced level of inflation.

The diagnostic tests performed on the short run model and presented in Table 5 were found to be satisfactory. We failed to reject the null hypotheses of the tests and conclude therefore that, there is no problem of heteroscedasticity,

Table 4. Long Run and Short Run ECM results

Dependent Variable: HDI_t				
Part A: Long Run Results				
Variable	*Coefficient*	*Std. Error*	*t − Stats*	*Prob.*
FDI_t	-0.0252***	0.0037	-6.6613	0.0000
TOP_t	-0.0010**	0.0004	-2.4282	0.0266
GE_t	0.0053***	0.0008	6.5568	0.0000
INF_t	0.0006**	0.0002	2.5901	0.0191
C	0.5391	0.0154	34.9641	0.0000
Part B: Short Run Results				
Variable	*Coefficient*	*Std. Error*	*t − Stats*	*Prob.*
$D(FDI_t)$	-0.0081***	0.0017	-4.7788	0.0002
$D(TOP_t)$	-0.0004***	0.0001	-4.3910	0.0004
$D(TOP_{t-1})$	0.0002**	0.0001	2.4855	0.0236
$D(GE_t)$	-0.0008	0.0006	-1.2715	0.2207
$D(INF_t)$	-3.36E-05	7.51E-05	-0.4478	0.6599
$D(INF_{t-1})$	-0.0003**	0.0001	-2.8723	0.0106
ECM_{t-1}	-0.5383***	0.0884	-6.0884	0.0000
R^2 = 0.6164		Adjusted R^2 = 0.5118		

*Note: *, ** and *** denote significance at 10%, 5% and 1% level.*
Source: Authors' computation (2022)

Table 5. Inspection of CLRM assumptions

| Tests	CLRM problem	χ^2 Value	χ^2 Prob.	Decision
Breusch-Godfrey LM	Serial Correlation	0.76640	0.6817	Serial independence
ARCH	Heteroscedasticity	1.2349	0.2664	Constant Variance
Jarque-Bera	Normality	3.4309	0.1798	Normal residuals
Ramsey RESET	Model Specification	0.1386	0.2563	No misspecification
CUSUM	Stability	-	-	Stable Model
CUSUM of Squares	Stability	-	-	Stable Model

Source: Author's compilation (2022)
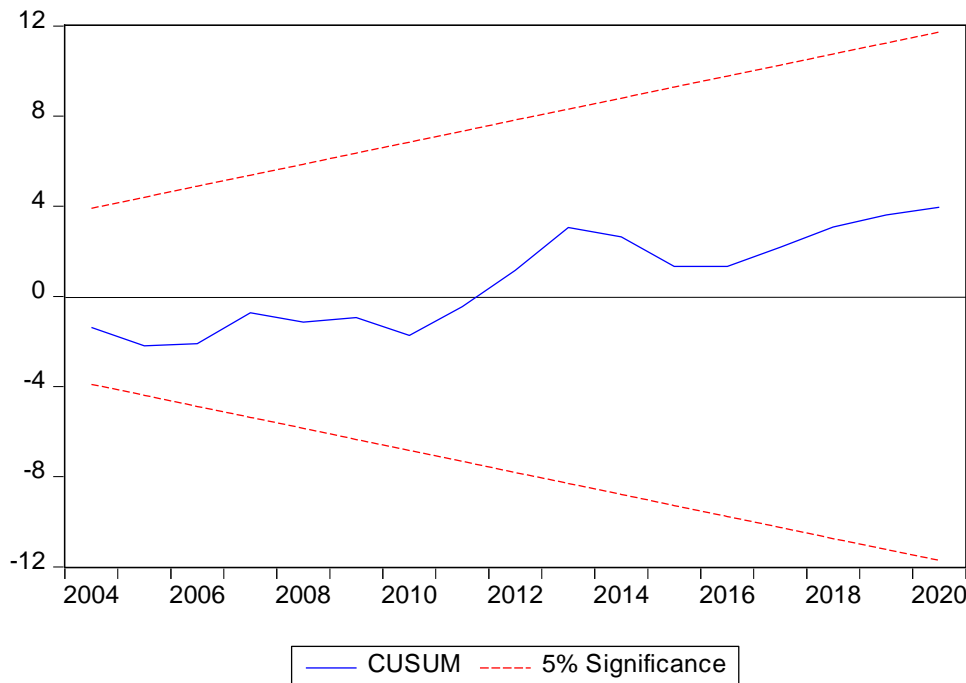
Fig. 1. CUSUM plot

serial dependence, misspecification, and structural breaks. Figs. 1 and 2 evidence stable parameters as the CUSUM and CUSUM of Squares plots lies within the 5% bound.

4.4 Analysis of Causality

In Table 7, we present the causality results based on the procedure outlined by Toda and Yamamoto [26]. The null hypothesis of the test is that causality does not exist and this is stated in column 2 and 4. Before the T-Y test, the optimal lag for the VAR model was determined. Table 6 gives this to be 1 based on the recommendations of AIC, SC and HQ criterion. The $VAR(1)$ model was estimated and stability determine using the Inverse Roots. Fig. 3 indicates that the $VAR(1)$ model is stable. We then augmented the $VAR(1)$

model with d_{max} (that is 1, the optimal integration order from Table 2). Table 7 show government expenditure Granger cause foreign direct investment. It is likely that foreign direct investment inflow in the next year may increase following increased government expenditure in the previous year as government tries to attract investors and sustain such inflows through provision of supporting business infrastructure. This means that the future movement in foreign direct investment can be explain using past value of government expenditure. The same is true in the relationship between inflation and trade openness. A change in inflation will lead to a change in trade openness as the T-Y result reveals one-way causality that runs from inflation to trade openness. Table 7 also divulge two-way causality existing between foreign direct investment and inflation.
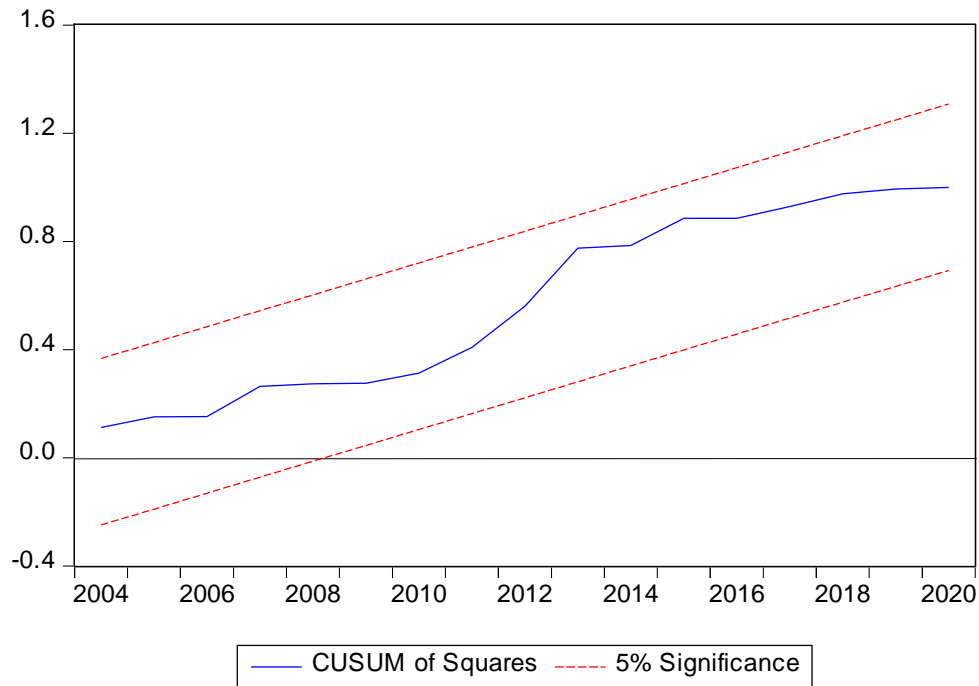
Fig. 2. CUSUM of squares plot

Table 6. Lag length for the VAR model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-245.9053	NA	22.5236	17.3038	17.5395	17.3776
1	-143.3818	154.6924*	0.1561*	12.3022*	12.7166*	12.7451*
2	-126.5223	27.1360	0.2296*	12.5187	15.1119	13.3309

*Note: * lag order selected by criterion*

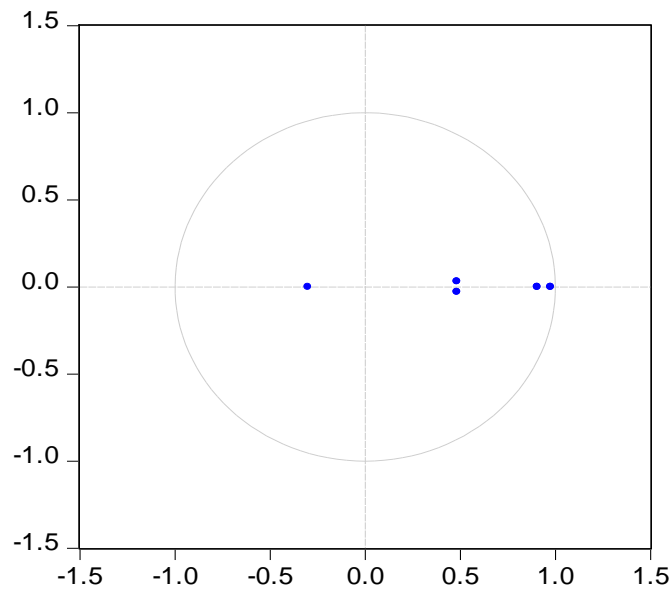## Inverse Roots of AR Characteristic Polynomial

Fig. 3. Stability of $VAR(1)$ Model

Table 7. Toda and Yamamoto causality test result

DF	Null hypothesis	Chi-sq.	Null hypothesis	Chi-sq.	Direction of causality
1	$fdi \nRightarrow hdi$	1.2037	$hdi \nRightarrow fdi$	1.1256	No causality
1	$top \nRightarrow hdi$	0.1290	$hdi \nRightarrow top$	0.0934	No causality
1	$ge \nRightarrow hdi$	1.4757	$hdi \nRightarrow ge$	0.3271	No causality
1	$inf \nRightarrow hdi$	0.0275	$hdi \nRightarrow inf$	0.1276	No causality
1	$top \nRightarrow fdi$	0.0100	$fdi \nRightarrow top$	0.0337	No causality
1	$ge \nRightarrow fdi$	5.3476**	$fdi \nRightarrow ge$	0.0067	$GE \rightarrow FDI$
1	$inf \nRightarrow fdi$	12.3267***	$fdi \nRightarrow inf$	6.5466**	$FDI \leftrightarrow INF$
1	$ge \nRightarrow top$	0.0037	$top \nRightarrow ge$	0.8138	No causality
1	$inf \nRightarrow top$	4.4981**	$top \nRightarrow inf$	0.1615	$INF \rightarrow TOP$
1	$inf \nRightarrow ge$	1.3149	$ge \nRightarrow inf$	0.3924	No causality

*Note: *, ** and *** indicate significance at 10%, 5% and 1% respectively*
Source: Author's computation (2022)

5. CONCLUSION AND RECOMMENDATION

This study which tries to understand how foreign direct investment relates with economic development, uncovered that the coefficient of foreign direct investment failed to appear with the theoretical positive sign. The autoregressive distributed lag (ARDL) result indicated that increased foreign direct investment inflow into Nigeria is counterproductive as it significantly reduces the prospect of Nigeria achieving economic development. The major sector recipient of these foreign direct investment inflows could explain why economic development in Nigeria declines following increased inflow. The extractive industry, which receives significant portion of FDI inflows, is a huge polluter of greenhouse gases which is detrimental to the life expectancy of Nigerians. The study's result on trade openness contravenes economic theory as significant negative relationship exist between trade openness and economic development. The conclusion drawn from these findings is that foreign inflows in the dimension of foreign direct investment deteriorates, rather than accelerate, economic development. To reverse this negative impact of foreign direct investment, this study recommends basic infrastructure should be provided by the government as this will boost real sector activities and appropriately redirect foreign direct investment inflow away from extractive sector to the productive sectors of the Nigerian economy.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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