Impact of Foreign Direct Investment and Interest Rates on Nigerian Economic Growth

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Abstract

Despite numerous efforts by the government to attract foreign direct investment (FDI) into the economy, the flow of FDI still remains abysmal in Nigeria. This paper investigates the impact of foreign direct investment inflows and interest rates on the economic growth of Nigeria for the period 1978–2019. The study employed secondary data extracted from the World Bank Development Indicator. The auto-regressive distributed lag (ARDL) technique was used to examine both the short-run and long-run relationships between the variables.The results indicated that FDI has no positive impact on the growth of the Nigerian economy, while gross fixed capital formation has a positive and significant impact. However, interest rates and inflation rates have a negative but insignificant influence on economic growth. The study recommends that there is a need for a thorough analysis of the institutional and economic factors that enable the beneficial influence of FDI inflows on developing nations, and efforts should be made to strengthen these factors.

**Keywords:** foreign direct investment, interest rate, economic growth, Nigeria

1.0   Introduction

Foreign direct investment (FDI) remains one of the fundamental drivers of economic growth. By complementing domestic capital with FDI, an economy can attain optimal level of productivity, hence economic growth (Baiashvili&Gattini, 2020). In order to sustain stability in macroeconomic performance, most countries continually implement policies that will stimulate inflow of FDI (Isaac & Emmanuel, 2021). Aside financial flow, FDI also complements domestic capabilities through technology transfer, skill transfer and market development (Alie & Hongliang, 2015).

Irrespective of the benefits of FDI, event has shown that foreign investors evaluate numerous factors before committing fortunes in foreign countries. Critical among them is the interest rate. As posited by Ekine, 2017; Alabi, 2019; Benson, Eya & Yunusa, 2019, changes in interest rate constitutes significant factor in the flow of FDI into every economy. The economic reality has shown that, foreign investors are more likely to move capital to countries that guarantee high returns on investment, low interest rate and conducive business environment (Pholphirul,

2002). In Nigeria, government has made substantial effort to attract FDI into the economy. These they implement through a number of policies like, right to 100% equity in subsidiary management, autonomous technology transfer, tax incentives, open access to all sectors of the economy, equal right to foreigner and nationals (World Bank, 2019). In spite of the FDI stimulating policies of the federal government, the flow of FDI still remains abysmal in Nigeria. This is expressed in the information in fig 1. The diagram depicts the pattern of FDI of Nigeria from 2011 to 2020.

Fig. 1
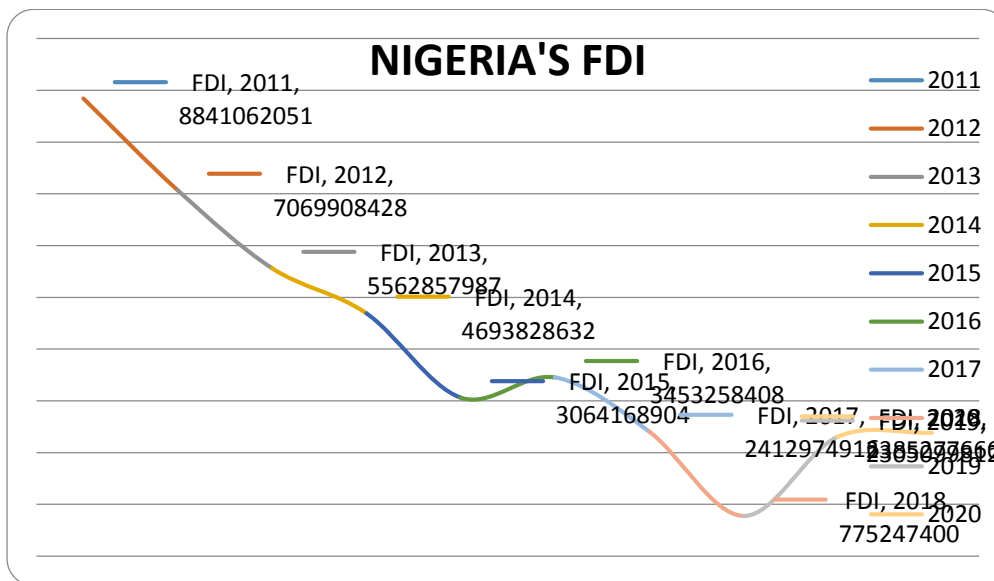
Nsofor (2016) was quick to point out that the observed decline in FDI was majorly orchestrated by the level of insecurity in the country. This is consistent with the view of Khalil & Musa (2014). According to them, insecurity undermines investor confidence, stimulates gradual extinction of domestic and foreign companies and retards the inflow of foreign capital for investment. In order to adjust for high inflation, there is continuous upward adjustment of interest rate in Nigeria (Utile et al., 2018). To this end, the study intends to examine the impact of foreign direct investment and interest rate on economic growth in Nigeria.

2.0   Literature Review

Empirical studies on foreign direct investment (FDI) and economic growth abound in economic field. The study by Baiashvili and Gattini, (2020) examined the impact of FDI on economic growth, income levels and institutional strength. The study was based on 111 countries stretching from developed economies to developing markets. The Generalised Method of Moment (GMM) panel technique was employed. The researchers found that absorptive

capacity stimulates FDI. Also, institutional strength has positive influence on FDI. Koc (2018) examined the impact of FDI on economic growth in six Central African Economic and Monetary Communities (CEMAC) over the period 1992 to 2016. The findings revealed that of all the selected macroeconomic variables, FDI depicts the major significant factor. In contrast, some studies revealed negative relationship between FDI and economic growth. For instance, Nsofor and Takon (2017) studied the impact of FDI on Nigeria's economic growth between 1985 and 2016. The OLS and Johansen cointegration techniques were employed. The findings revealed that FDI has negative impact on economic growth but trade openness and exchange rate have positive but insignificant influence on the economy. The study recommends in-depth investigation into economic forces that drive FDI inflows to developing countries.

Further study on the impact of FDI on economic growth was conducted by Jilenga& Helian (2017) in 36 countries in Sub-Saharan Africa. Fixed effect and GMM models of analysis were employed on data that spans from 2001 to 2015. The results indicate that FDI has a significant negative effect on economic growth. Focusing on interaction between FDI and institutional quality, the study revealed that quality institution enhances FDI and by extension economic growth.

In Nigeria, Uwubanmwen and Oyiemudia (2016) examined the effect of foreign direct investment on economic growth. Annual time series data from 1979 to 2013 were analysed using Error Correction Model (ECM) technique. This is to determine short and long run effect of FDI on economic growth. Granger causality method was also employed to analyse the relationship. The result shows that FDI has insignificant negative effect on the Nigerian economy in the long run. Although, in the short run, the outcome revealed positive and significant relationship between FDI and economic growth. The study therefore recommends that government should ensure stable macroeconomic policies to stimulate more FDI into the economy.

To the best of our knowledge and the empirical review, no study simultaneously examined the impact of FDI and interest rate on economic growth. This we intend to execute using the Nigerian economy.

3.0   Methodology

Following the theoretical foundation of the neoclassical growth theory as well as empirical models of past studies such as Adamu *et al*. (2015), Ha *et al*. (2017) and Nsofor and Tanko (2017). The empirical model is derived from the production function framework that integrates FDI as one of the factors, along with real interest rate, official exchange rate, inflation rate, trade openness and gross fixed capital formation as expressed below:

$$GDP_t = \beta_0 + \beta_1 FDI_t + \beta_2 INT_t + \beta_3 EXCR_t + \beta_4 INF_t + \beta_5 TOP_t + \beta_6 GFCF_t + \mu_t \dots\dots\dots\dots 1$$

The log-log model form is used in order to have the same unit of values for the variables and the mathematical form is stated as:

$$LGDP_t = \beta_0 + \beta_1 LFDI_t + \beta_2 LINT_t + \beta_3 LEXCR_t + \beta_4 LINF_t + \beta_5 LTOP_t + \beta_6 LGFCF_t + \mu_t \dots\dots\dots 2$$

Where the dependent variable is GDP (gross domestic product growth rate), and the independent variables are foreign direct investment net inflows in Nigeria (FDI), real interest rate (INT), official exchange rate (EXCR), inflation rate (INF), openness to trade (TOP) and gross fixed capital formation (GFCF).

An auto-regressive distributive lag (ARDL) test approach was used to analyse the short and long-term relationship between the variables. The study employed secondary data from 1978 to 2019. All data are extracted from World Bank Development Indicator. E-Views software was employed for running the time series data.

4.0   Result and Discussion

4.1   Descriptive Statistics

Table 1 shows the descriptive statistics of the variables employed. The result reveals the mean, median, maximum, minimum, standard deviation, skewness, Kurtosis and Jarque Bera statistics. It shows that the average value of log of gross domestic product is 2.814133, log of foreign direct investment (LFDI) is 1.221050, log of real interest rate (LINT) is 4.055480, log of official exchange rate (LEXCR) is 3.191195, log of inflation (LINF) is 2.564975, log of

trade openness (LTOP) is 3.407491 while log of gross fixed capital formation (LGFCF) is 3.521339. The median result shows that LGDP is 2.954930, LFDI is 1.251159, LINT is 4.229495, LEXCR is 3.809734, LINF is 2.480325, LTOP is 3.535727 and LGFCF is 3.608008. The maximum, minimum and standard deviation were also presented in table 1. However, the skewness statistics reveals that all the variables except INF and LGFCF are skewed to the left. The kurtosis statistics reveal that LGDP, LFDI, LINT, LINF and LTOP are leptokurtic that is, they are greater than 3 while LEXCR and LGFCF are platykurtic that is, less than 3. The Jarque-Bera statistics through its probability reveal that all the variables are normally distributed except LGDP and INT which are not normally distributed during the study period.

Table 1. Descriptive Statistics

	LGDP	LFDI	LINT	LEXCR	LINF	LTOP	LGFCF
Mean	2.814133	1.221050	4.055480	3.191195	2.564975	3.407491	3.521339
Median	2.954930	1.251159	4.229495	3.809734	2.480325	3.535727	3.608008
Maximum	3.412109	2.052950	4.432957	5.726587	5.389085	3.975523	4.528701
Minimum	0.627071	-0.163526	-1.945951	-0.603707	-0.376734	2.212206	2.651037
Std. Dev.	0.486308	0.371631	0.961808	2.176624	0.945474	0.488703	0.583612
Skewness	-2.836840	-0.773338	-5.989072	-0.607637	0.023694	-1.193932	0.095899
Kurtosis	12.27690	6.254586	37.88023	1.902877	5.185922	3.435967	1.989372
Jarque-Bera	206.9401	22.72294	2380.186	4.691002	8.365876	10.31093	1.851773
Probability	0.000000	0.000012	0.000000	0.095799	0.015254	0.005768	0.396180
Sum	118.1936	51.28408	170.3301	134.0302	107.7290	143.1146	147.8962
Sum Sq. Dev.	9.696301	5.662499	37.92805	194.2453	36.65076	9.792062	13.96474
Observations	42	42	42	42	42	42	42

Source: Author's Computation

4.2 Unit Root Result

The unit root results are presented in table 2 and the result reveals that LGDP, LINT and LINF are stationary at level while the other variables such as LFDI, LEXCR, LTOP and LGFCF are stationary after converting them to first difference. This implies that all the variables used in this study were stationary during the study period.

Table 2

	At level		At first difference		Order of integration
	t-statistics	p-value	t-statistics	p-value	
LGDP	-4.814817	0.0019	-	-	I(0)
LFDI	-2.053032	0.2641	-10.19447	0.0000	I(1)
LINT	-6.164057	0.0000	-	-	I(0)
LEXCR	-0.946641	0.9404	-5.514806	0.0003	I(1)
LINF	-4.541448	0.0007	-	-	I(0)
LTOP	-2.503014	0.3252	-6.790905	0.0000	I(1)
LGFCF	-0.568585	0.9757	-5.022391	0.0011	I(1)

Source: Author's Computation 2023

4.3   ARDL Estimation Result

The ARDL estimation in this research focuses on the impact of FDI, interest rate, exchange rate, inflation rate, trade openness and gross fixed capital formation on Nigerian economic growth. Table 3 shows the results of ARDL estimation in Nigeria. Economic growth (-4) has a positive and significant on the economic growth of Nigeria. This indicates that the lagged economic growth can be a determinant of the economic growth.

FDI (-1) has a negative impact on Nigerian economy. This indicates that FDI has an influence on economic growth. Meanwhile, FDI (-3) has a positive and significant impact on economic growth. Hence, the inflow of FDI into the domestic economy needs to be properly managed to ensure the use of FDI, which can promote economic growth.

Interest rate (-4) has a negative and significant impact on the economic growth. This confirms that the variable does not support economic growth. Exchange rate (-3) and exchange rate (-4) have significant impact on economic growth. The result is mixed as a unit increase LEXCR (-3) increases GDP by 0.2294 and LEXCR (-4) shows that a unit increase in exchange rate reduces the level of economic growth by 0.3439. Meanwhile, inflation rate does not impact economic growth.

Trade openness (-2) has a negative and significant impact on economic growth. The result shows that a unit increase in trade openness causes GDP to decrease by 0.2699. This indicates that openness to trade tends to inhibit economic growth. Gross fixed capital formation (-4) has a positive and significant impact on economic growth. This indicates that a unit increase in gross fixed capital formation will increase economic growth by 1.3831. The adjusted R-squared of the ARDL estimate is 0.956917. This suggests that 95.69% of the variation in the dependent variable is explained by the variation in the independent variable. In addition, this value is also an indicator of the goodness of fit of the relatively good assessment of the ARDL. In addition, ARDL estimate of the F statistic value is significant, which indicates that all independent variables have a significant impact on the dependent variable at the same time.

Table 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGDP(-1)	0.114829	0.186559	0.615512	0.5553
LGDP(-2)	0.297567	0.131810	2.257542	0.0539
LGDP(-3)	0.173872	0.087720	1.982119	0.0828
LGDP(-4)	0.306719	0.099392	3.085935	0.0150
LFDI	-0.220478	0.095620	-2.305764	0.0500
LFDI(-1)	-0.258745	0.103613	-2.497221	0.0371
LFDI(-2)	0.058725	0.114041	0.514947	0.6205
LFDI(-3)	0.392405	0.091692	4.279619	0.0027
LINT	-0.022884	0.221469	-0.103327	0.9202
LINT(-1)	-0.051044	0.106737	-0.478227	0.6453
LINT(-2)	-0.006716	0.085884	-0.078199	0.9396
LINT(-3)	-0.109078	0.076217	-1.431141	0.1903
LINT(-4)	-0.213890	0.048186	-4.438812	0.0022
LEXCR	0.043759	0.088464	0.494651	0.6341
LEXCR(-1)	0.212499	0.102460	2.073970	0.0718
LEXCR(-2)	0.053665	0.082222	0.652680	0.5323
LEXCR(-3)	0.229483	0.090547	2.534401	0.0350
LEXCR(-4)	-0.343962	0.060888	-5.649119	0.0005
LINF	-0.080279	0.039012	-2.057815	0.0736
LTOP	0.141844	0.140311	1.010927	0.3416
LTOP(-1)	-0.118913	0.094479	-1.258613	0.2437
LTOP(-2)	-0.269984	0.082227	-3.283394	0.0111
LTOP(-3)	0.026502	0.085196	0.311075	0.7637
LTOP(-4)	-0.145888	0.113544	-1.284855	0.2348
LGFCF	-0.069081	0.220013	-0.313987	0.7616
LGFCF(-1)	-0.143444	0.310694	-0.461689	0.6566
LGFCF(-2)	-0.410812	0.242735	-1.692429	0.1290
LGFCF(-3)	-0.282120	0.330194	-0.854407	0.4177
LGFCF(-4)	1.383189	0.291490	4.745229	0.0015
C	0.924659	1.657611	0.557826	0.5922

R-squared	0.990685	Mean dependent var		2.876531
Adjusted R-squared	0.956917	S.D. dependent var		0.341902
S.E. of regression	0.070967	Akaike info criterion		-2.432411
Sum squared resid	0.040290	Schwarz criterion		-1.139580
Log likelihood	76.21581	Hannan-Quinn criter.		-1.972431
F-statistic	29.33816	Durbin-Watson stat		1.818003
Prob(F-statistic)	0.000018			

Source: Author's Computation
*Note: p-values and any subsequent tests do not account for model Selection

4.3.1 Bounds Test

Table 4 shows the result of Bounds Test; the F-statistic (9.04), which is greater than the value at 10%, 5%, 2.5% and 1% of significance level. Therefore, there can be at least long or short run relationship among the variables of the study.

Table 4
Bounds Test   Null Hypothesis: No cointegrating relationships exist

Test Statistic	Value	Significance	I0 Bound	I1 Bound
F-statistic	9.044828	10%	2.12	3.23
k	6	5%	2.45	3.61
		2.5%	2.75	3.99
		1%	3.15	4.43

LGDP = (-0.2625*LFDI -3.7716*LINT + 1.8263*LEXCR -0.7502 *INF -3.4242*LTOP + 4.4642*LGFCF + 8.6406)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDI	-0.262510	1.458512	-0.179985	0.0016
LINT	-3.771607	9.944779	-0.379255	0.7144
LEXCR	1.826349	3.596852	0.507763	0.6253
LINF	-0.750182	1.411107	-0.531626	0.6094
LTOP	-3.424232	7.409621	-0.462133	0.0463
LGFCF	4.464235	8.139308	0.548478	0.0283
C	8.640604	26.986299	0.320185	0.7570

Source: Author's Computation

The result revealed that FDI has negative impact on economic growth as a unit increase in FDI reduces growth by 0.262510. This is contrary to the a priori expectation but similar to the findings of Jilenga (2017), Nsofor and Takon (2017) and Khajeh et al., (2019) that claim that inflow of FDI inhibit the host country's economic growth.

Trade openness also has a negative and significant impact on economic growth because a unit increase in trade openness causes GDP to reduce by 3.424. This may be due to high level of import than export in the country. The result is similar to other studies on Nigeria economy conducted by Akims*et al*. (2018), Elijah (2019) and Mbingui (2021).

The coefficient of gross fixed capital formation is positive and statistically significant at 5 percent level of significance. With a coefficient of 4.464, it means that a unit increase in gross fixed capital formation will cause economic growth to increase by approximately 4.464 in the long run. This is consistent with the endogenous growth theory and neoclassical theory which states that domestic capital affects economic growth. It also supports the findings of Appiah-Konadu *et al*. (2016) and Boakye (2017).

Interest rate has a negative correlation with economic growth though not significant. This could be due to the irrelevance of the financial sector in providing the requisite loan to investors. The result obtained is similar to the findings of Drobyshevsky*et al*. (2008) and Leontieva (2012), who also discovered that the impact of real interest rate on the real economy indicators was found to be insignificant.

In addition, inflation has a negative (-0.750182) and insignificant (0.6094) association with GDP. This infers an expansion in inflation will prompt a reduction in GDP anyway the decline may not be sufficiently critical reduce growth. The insignificant relationship is supported by Khan and Senhadji (2001) and Vikesh and Subrina (2004), Ramlan (2017) and Salami (2018).

The result on exchange rate shows a positive (1.826349) impact on economic growth in Nigeria. This result is contrary to that of apriori expectation stated earlier that increase in exchange rate would have a negative influence on GDP. Exchange rate is the cost of a dollar for Nigeria. The findings also indicate that the effect of exchange rate is insignificant (0.6253) to economic growth; this is in line with the research of Utile et al. (2018). This is an indication that in spite of the positive effect of exchange rate on GDP, the effect is not so obvious to a level of increasing the GDP.

5.0   Conclusion and Recommendation

The results indicated that FDI has no positive impact on the growth of the Nigerian economy, while gross fixed capital formation has a positive and significant impact. However, interest rates and inflation rates have a negative but insignificant influence on economic growth. The study recommends that there is a need for a thorough analysis of the institutional and economic factors that enable the beneficial influence of FDI inflows on developing nations, and efforts should be made to strengthen these factors. According to the study, trade openness has a negative and substantial influence on Nigeria's economic growth which is contrary to theoretical and aprioriexpectation. This indicates that the more the economy is open up to

international trade, the lesser the growth. The study concludes that trade openness is harmful to economic growth in Nigeria. Thus, policy makers are urged to promote policies that will enhance domestic productivity that could enable self-reliance of the economy in the long run.

A uniform macroeconomic policy to create states of certainty and stability in the country would be ideal, for example, other policies such as the standardisation of the exchange rate and its stabilization through a manageable variable interest rate could bring about a rational stability of the foreign exchange market to allow its significance. The gross fixed capital formation stimulates economic growth, thus, policies that will improve stock of domestic capital should be embraced.

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