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Abstract

This study examines the effect of foreign direct investment (FDI) inflows on economic growth in Nigeria from 2010 to 2019. Using the ordinary least square regression methodology, the findings reveal that foreign direct investment inflows do not have a significant effect on economic growth in Nigeria. The result holds when different measures of economic growth and different measures of foreign direct investment inflows are employed. Meanwhile, population size, real interest rate, domestic private credit and the inflation rate are significant determinants of economic growth in Nigeria while gross capital formation is an insignificant determinant of economic growth in Nigeria. The implication of the findings is that policy makers in Nigeria should focus on other drivers of economic growth other than foreign direct investment inflows when developing policy initiatives to stimulate economic growth in Nigeria.

Keywords: Nigeria, foreign direct investment, economic growth, gross capital formation, GDP, inflation, domestic private credit, population, interest rate, GDP growth

JEL code: E23; F21; F30; O55.

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1. Introduction

The objective of the study is to investigate the effect of foreign direct investment inflows on economic growth in Nigeria from 2010 to 2019. Nigeria is a major recipient of foreign direct investment (FDI) inflows in Africa, even though Nigeria's share of global FDI inflows lags behind other African countries. FDI inflows to Nigeria have witnessed a downward trend in recent years. In 2017, FDI net inflows reached US$3.5billion (0.9% of GDP). In 2018, FDI net inflows declined to US$1.99billion (0.5%). In 2019, FDI net inflows reached 0.74% of GDP. In nominal terms, FDI inflows to Nigeria have decreased over the years. Some studies in the literature argue that the decrease in FDI inflows to Nigeria is attributable to small market size, lack of economic freedom, volatile exchange rate and low economic growth rate (Jibir and Abdu, 2017; Aderemi et al, 2020).

Recently, great attention has been paid to the determinants of economic growth in the economic literature, and there is much emphasis on the effect of FDI inflows on economic growth (see, for example, Jebli et al, 2019; Dinh et al, 2019; Owusu-Nantwi and Erickson, 2019; Yeboua, 2019; Hagan and Amoah, 2019). Such studies commonly investigate the determinants of economic growth while controlling for other important factors affecting economic growth. Several studies document mixed results on the effect of FDI on economic growth. A positive relationship between FDI and economic growth is documented in Alabi (2019), Bakari et al (2018), Appiah-Otoo et al (2023), Emako et al (2022), and Hasan and Ringim (2017), while Okumoko et al (2018) found an insignificant effect of FDI on economic growth. These mixed results suggest that the effect of FDI on economic growth of the recipient country may be influenced by other factors in the recipient country.

This study contributes to the literature in several ways. It contributes to the existing literature by relying on recent data and using alternative proxies of economic growth and foreign direct investment inflows. To the best of my knowledge, this study is among the first studies to examine the impact of FDI inflows on economic growth using recent data and using different measures of economic growth and foreign direct investment in the case of Nigeria.

The rest of the article is structured as follows. Section 2 presents the literature review. Section 3 presents the methodology. Section 4 discuss the results. Section 5 concludes the study.

2. Literature review

The theoretical literature argues that there is a link between foreign direct investment and economic growth. Proponents of FDI argue that FDI can be used for the acquisition of new plants and equipment from local suppliers, which will have positive "spillovers" to the local economy (Doytch and Uctum, 2011; Gurkov et al, 2020). FDI can also be used to purchase ownership stake in existing local firms and the funds can be used to train employees to improve the competition which is beneficial for growth (Colen et al, 2012). However, FDI also have a negative effect on economic growth especially when FDI increases domestic competition and forces local firms to shut down thereby hurting economic growth (Borensztein et al, 1998).

Several studies in the literature examine the economic effect of foreign direct investment. For instance, Nangpiire et al (2018) assess the effect of ease of doing business on foreign direct investment (FDI) inflows in Sub-African countries. They find that the ease of doing business indicators significantly influence FDI inflows in Sub-Sahara African countries. The authors recommend that the government or policy makers should adjust their ease of doing business procedures to attract foreign direct investment. Contractor et al (2020) examine the impact of regulatory variables in attracting or deterring foreign direct investment in 189 countries. They find that countries with stronger contract enforcement and more efficient international trade regulations attract more FDI. Eregha (2019) examines the effect of exchange rate, its volatility and uncertainty on foreign direct investment inflows in West African monetary zone (WAMZ) countries from 1980 to 2014. The results show that exchange-rate movements in WAMZ countries affect FDI inflow.

Canh et al (2020) investigate the impact of the 'domestic economic policy uncertainty index' and the 'world uncertainty index' on net foreign direct investment inflows in 21 economies from 2003 to 2013. They find that an increase in the global (world) economic policy uncertainty leads to an increase in FDI inflows. Khan and Ozturk (2020) investigate the causal linkage between carbon dioxide (CO_2) emissions and net foreign direct investment (FDI) for 17 countries from Asia during the 1980 to 2014 period. They find that FDI inflows have a positive impact on environmental pollution. They recommend that economic policy reforms are required to channel foreign capital

inflows to a more environmentally healthy direction. Similarly, Sarkodie and Strezov (2019) find that foreign direct investment increases the level of CO2 emissions in Indonesia. Kumari and Sharma (2017) analyse some determinants of FDI using data from 20 developing countries in South, East and South-East Asia. They find that market size is the most significant determinant of FDI inflow.

Ullah and Khan (2017) examine the determinants of foreign direct investment (FDI) by focusing on the institutional and economic factors affecting FDI in selected Asian countries. They use the generalized method of moments regression methodology, and find that real GDP, domestic investment, and economic freedom index have a positive and significant effect on FDI inflows in the Asian region, while governance index and labor force have a negative impact on FDI inflows. Gnangnon (2017) investigate the impact of multilateral trade liberalisation on inward foreign direct investment. They use data from 171 countries during the 1995 to 2012 period. The results show that multilateral trade policy liberalisation leads to higher FDI inflows in host countries. Alfalih and Hadj (2020) explore the determinants of FDI inflows in an oil abundant host country, focusing on Saudi Arabia from 1984 to 2017. The findings indicate that the size of markets, the real exchange rate, and law and order have positive effects on FDI both in the short- and long-run periods. Oil exports had no impact on short or long-run FDI.

Ibrahim et al (2019) examine the effect of information, communication, and technology (ICT) infrastructure on FDI in Africa using a panel of 46 countries from 1980 to 2016. They use the generalized method of moments (GMM) regression method and show that well–developed ICT infrastructure increases FDI regardless of the measure of ICT used. Reza et al (2018) examine the relationship between FDI and economic growth in Bangladesh from 1990 to 2015 using the co-integration and vector error correction metrics (VECM) approach. They find a positive relationship between FDI inflows and GDP in the long-run and short-run. Sokang (2018) investigates the impact of FDI on economic growth in Cambodia from 2006 to 2016. Using correlation matrix and multiple regression analysis, the results of the study reveal that FDI has a positive impact on economic growth in Cambodia. Mukhtarov et al (2019) investigate the impact of foreign direct investment (FDI) on exports in the case of Jordan from 1980 to 2018 using the

autoregressive distributed lag bounds test (ARDL BT) cointegration approach. They find that there is a positive and statistically significant impact of FDI on export in the long-run.

Some studies examine the case of Nigeria. For instance, Akinwale et al (2018) explore the impact of foreign direct investment on agricultural productivity in Nigeria. They use the Augmented Dickey-Fuller (ADF) test, Johansen test and Error Correction Model to examine the effect of foreign direct investment on agricultural productivity in Nigeria. They find that both foreign direct investment and bank credit to the agricultural sector have a significant effect on agricultural productivity. Aderemi et al (2020) investigate the determinants of FDI inflows in Nigeria from 1990 to 2017. They find that the determinants of FDI inflows in Nigeria are past FDI inflows, market size, exchange rate and growth rate. These macroeconomic variables have a positive and significant impact on FDI inflows in Nigeria, while the inflation rate discourage FDI inflows in the country. Omodero (2019) investigates the effect of corruption on foreign direct investment inflows in Nigeria from 1996 to 2017 using ordinary least squares. The study finds that corruption has a significant positive influence on FDI. Alabi (2019) investigates the impact of foreign direct investment on economic growth in Nigeria from 1986 to 2017. They find that foreign direct investment has a positive and significant effect on economic growth in Nigeria. Ehigiamusoe and Lean (2019) examine the impact of foreign capital inflows on economic growth in Nigeria from 1980 to 2015. The authors employ the autoregressive distributed lagged (ARDL)-bounds test. They find that foreign direct investment and foreign aid have an insignificant impact on economi growth in Nigeria.

3. Methodology

3.1. Data

Macroeconomic and macro-financial data for Nigeria were extracted from the World Bank's World Development Indicators. The Nigerian data in the World Bank database was supplied by the Nigerian Bureau of Statistics and the Central Bank of Nigeria. The sample period covers 2010 to 2019 which is a 10-year period. The 2010 cut-off period allows us to isolate the effect the 2007-

2008 global financial crisis so that events from the crisis will not contaminate the data. The data point ends in 2019 to isolate the effect of the COVID-19 pandemic.

3.2. Model

The baseline model adopted for estimating the effect of FDI inflows on economic growth is specified below. The variables used in the model are similar to those adopted in Ibrahim and Sare (2018), Ozili (2024), Acquah and Ibrahim (2020) and Ozili et al (2023a).

$$(GDPG, GDPPCG)t = FDIPt + INFt + INTt + GFCFt + POPt + CREDITt + et \ldots\ldots\ldots eqn\,1$$

$$(GDPG, GDPPC)t = FDINt + INFt + INTt + GFCFt + POPt + CREDITt + e \ldots\ldots\ldots\ldots eqn\,2$$

Economic growth (EG) is the dependent variable, which is measured using two variables: the real GDP growth rate variable and the real GDP per capita variable. The foreign direct investment inflow variable, which is the focal explanatory variable, is measured using two variables: the FDI inflow as a per cent of GDP (FDIP), and the logarithm of FDI inflow amount in USD (FDIN). The control variables are the inflation rate (INF); gross fixed capital formation (GFCF); real interest rate (INT); total population size (POP); domestic credit to private sector to GDP ratio (CREDIT); 'e' is the error term; and 't' is the year.

3.3. Summary of data variable, source and predicted signs

The table below summarizes the variable description, source of data and the predicted sign on the coefficient of the variables.

Table 1: Data and variable summary

Data	Symbol	Predicted sign	Source
Real GDP growth rate (%)	GDPG		World Bank, NBS, CBN
Real GDP per capita	GDPPC		World Bank, NBS, CBN
Inflation rate (%)	INF	-	World Bank, NBS, CBN
Real interest rate (%)	INT	-	World Bank, NBS, CBN
FDI net inflows (% of GDP)	FDIP	+	World Bank, NBS, CBN
FDI net inflows, amount in USD	FDIP	+	World Bank, NBS, CBN
Total Population	POP	+	World Bank, NBS, CBN
Gross fixed capital formation (% of GDP)	GFCF	+	World Bank, NBS, CBN
Domestic credit to private sector (% of GDP)	CREDIT	+	World Bank, NBS, CBN

4. Empirical Results

4.1. Descriptive analysis

Table 2 reports the descriptive statistics. The FDIP variable is 1.1% of GDP on average. This indicates that foreign direct investment inflows contribute very little to GDP in Nigeria. The average rate of inflation (INF) in Nigeria is 11.8% which is high compared to the real interest rate (INT) at 7.22%. This indicates that the general price level in Nigeria is rising faster than real interest rates. Credit supply to the private sector (CREDIT) is 12.12% of GDP. This suggests that the domestic credit provided to the private sector by financial institutions in relation to the size of GDP is low in Nigeria. Gross fixed capital formation (GFCF) is also below the 30% threshold at 16.46%. This means that capital investment in Nigeria is low. Population size (POP) also has an upward trend in Nigeria.

Table 2. Descriptive statistics

	FDIP	FDIN	GDPG	GDPPC	INF	INT	GFCF	POP	CREDIT
Mean	1.125	22.22	3.64	2415.59	11.80	7.22	16.46	19.00	12.12
Median	1.02	22.24	3.44	2391.57	11.74	6.14	14.95	19.00	12.19
Maximum	2.18	22.90	8.01	2550.47	16.52	13.59	25.41	19.12	14.61
Minimum	0.50	21.41	-1.62	2280.43	8.06	1.06	14.16	18.88	10.24
Std. Dev.	0.53	0.44	2.98	87.19	2.89	3.73	3.47	0.07	1.52
Observations	10	10	10	10	10	10	10	10	10

4.2. Correlation analysis

Table 3 reports the Pearson correlation results. The FDIP variable is inversely correlated with the GDPPC, INT, GFCF, POP and CREDIT variables. This means that high foreign direct investment inflows are associated with low GDP per capita, low real interest rate, low population, low gross fixed capital formation and low domestic credit to private sector in Nigeria during the period. Meanwhile, FDIP is negative and significantly correlated with GDPPC and population size. On the other hand, the FDIP variable is positively correlated with the GDPG and INF variables. This means that higher foreign direct investment inflows are associated with higher real GDP growth and higher inflation rate in Nigeria. Regarding the FDIN variable, the FDIN variable is inversely correlated with the GDPPC, INF, INT, GFCF, POP variables. This means that high foreign direct

investment inflows are associated with low GDP per capita, low inflation, low real interest rate, low population, and low gross fixed capital formation in Nigeria during the period. Meanwhile, FDIN is negative and significantly correlated only with population size. On the other hand, the FDIN variable is positively correlated with the GDPG and CREDIT variables. This means that higher foreign direct investment inflows are associated with higher real GDP growth and higher domestic private credit in Nigeria.

Table 3: Pearson correlation matrix

Variable	FDIP	FDIN	GDPG	GDPPC	INF	INT	GFCF	POP	CREDIT
FDIP	1.000								

FDIN	0.914***	1.000							
	(0.00)	-----							
GDPG	0.451	0.540	1.000						
	(0.19)	(0.11)	-----						
GDPPC	-0.579*	-0.301	-0.152	1.000					
	(0.08)	(0.39)	(0.67)	-----					
INF	0.121	-0.089	-0.566*	-0.529	1.000				
	(0.74)	(0.80)	(0.08)	(0.11)	-----				
INT	-0.435	-0.172	-0.005	0.939***	-0.671**	1.000			
	(0.21)	(0.63)	(0.98)	(0.00)	(0.03)	-----			
GFCF	-0.307	-0.417	-0.142	-0.322	-0.001	-0.408	1.000		
	(0.38)	(0.23)	(0.69)	(0.36)	(0.99)	(0.24)	-----		
POP	-0.820***	-0.849***	-0.748**	0.266	0.201	0.105	0.547*	1.000	
	(0.00)	(0.002)	(0.01)	(0.45)	(0.57)	(0.77)	(0.10)	-----	
CREDIT	-0.029	0.061	-0.143	0.341	0.280	0.148	-0.467	-0.146	1.000
	(0.93)	(0.86)	(0.69)	(0.33)	(0.43)	(0.68)	(0.17)	(0.68)	-----

P-values are reported in parenthesis. ***, **, * denote statistical significance at the 1%, 5% and 10% levels.

4.3. Regression results

4.3.1. Effect of FDI inflows (% of GDP) on economic growth

Table 4 reports the regression results using the model in equation 1. In column 1, the dependent variable is real GDP growth (GDPG). In column 2, the dependent variable is GDP per capita. The focal explanatory variable is the FDIP variable which represents foreign direct investment inflows as a per cent of GDP (FDIP). The FDIP coefficient is negative and insignificantly related to real GDP growth rate and real GDP per capita in columns 1 and 2. This indicates that FDI inflows are not significantly related to economic growth in Nigeria during the period examined. This result confirms the findings of Ehigiamusoe and Lean (2019) who document that foreign direct investment has an insignificant impact on economic growth. In contrast, this result does not support the findings of Alabi (2019) and Acquah and Ibrahim (2020) who find a positive relationship between FDI and economic growth. For the control variables, the INF coefficient is negative and significantly related to real GDP growth rate in column 1. This indicates that low inflation leads to higher real GDP growth rate in Nigeria, and vice versa. Meanwhile, the INF coefficient is negative and insignificantly related to real GDP per capita in Nigeria in column 2. This finding supports the findings of Aderemi et al (2020) and Acquah and Ibrahim (2020) who find a negative relationship between inflation and economic growth. The INT coefficient is negative and significantly related to real GDP growth rate in column 1. This indicates that a low real interest rate leads to higher real GDP growth rate in Nigeria, and vice versa. Meanwhile, the INT coefficient is positive and significantly related to real GDP per capita in column 2. This indicates that a high real interest rate leads to higher real GDP per capita in Nigeria, and vice versa. The GFCF coefficient is negative and significantly related to real GDP growth rate in column 1. This indicates that a low gross fixed capital formation leads to higher real GDP growth rate in Nigeria, and vice versa. Meanwhile, the GFCF coefficient is positive and insignificantly related to real GDP per capita in Nigeria in column 2. This finding does not support the findings of Acquah and Ibrahim (2020) who find a positive relationship between gross fixed capital formation and economic growth. The POP coefficient is positive and significantly related to real GDP growth rate and real GDP per capita in columns 1 and 2. This indicates that a larger population size has positive benefits for economic growth in Nigeria. The finding supports the results obtained in

Acquah and Ibrahim (2020) who find a positive relationship between inflation and economic growth. The CREDIT coefficient is positive in columns 1 and 2 but is significantly related to real GDP per capita in column 2. This indicates that higher credit supply to the private sector increases GDP per capita in Nigeria.

Table 4. OLS regression: impact of FDI inflows (% of GDP) on economic growth		
	(1)	(2)
	Dependent variable: *Real GDP growth*	Dependent variable: *GDP per capita*
Explanatory variables	Coefficient (t-statistic)	Coefficient (t-statistic)
FDIP	-1.385 (-0.82)	-18.567 (-0.72)
INF	-1.737*** (-4.81)	-2.049 (-0.37)
INT	-1.238** (-3.37)	18.947** (3.23)
GFCF	-0.704* (-2.44)	1.160 (0.26)
POP	2.217** (3.23)	111.36*** (10.56)
CREDIT	0.367 (0.94)	15.567* (2.59)
R^2	89.52	97.11
Adjusted R^2	76.42	93.48
Durbin-Watson Test	3.36	3.34
Results are estimated using the ordinary least square regression estimation. T-statistics are reported in parenthesis. Regression coefficients are reported above the t-statistics. ***, **, * denotes statistical significance at the 1%, 5% and 10% level. FDIP= foreign direct investment net inflows (as a % of GDP); INF = inflation rate; INT = real interest rate; GFCF = gross fixed capital formation; POP = total population size; CREDIT = domestic credit to private sector (% of GDP).		

4.3.2. Effect of FDI inflows amount in USD on economic growth

Table 5 reports the regression results using the model in equation 2. In column 1, the dependent variable is real GDP growth which is the GDPG variable. In column 2, the dependent variable is GDP per capita which is the GDPPC variable. The focal explanatory variable is FDIN which represents the logarithm of the foreign direct investment inflow amount in USD. The FDIN coefficient is negative and insignificant in columns 1 and 2. This indicates that the FDI inflow amounts are not significantly related to economic growth in Nigeria during the period examined. This result confirms the findings of Ehigiamusoe and Lean (2019) who document that foreign direct investment has an insignificant impact on economic growth. In contrast, this result does not support the findings of Alabi (2019) and Acquah and Ibrahim (2020) who find a positive relationship between FDI and economic growth.

For the control variables, the INF coefficient is negative and significantly related to real GDP growth rate in column 1. This indicates that low inflation leads to higher real GDP growth rate in Nigeria. Meanwhile, the INF coefficient is negative but statistically insignificant in relation to real GDP per capita in Nigeria in column 2. This finding supports the findings of Aderemi et al (2020), Acquah and Ibrahim (2020) who find a negative relationship between inflation and economic growth. The INT coefficient is also negative and significantly related to real GDP growth rate in column 1. This indicates that a low real interest rate leads to higher real GDP growth rate in Nigeria, and vice versa. Meanwhile, the INT coefficient is positive and significantly related to real GDP per capita in column 2. This indicates that a high real interest rate leads to higher real GDP per capita in Nigeria, and vice versa. The GFCF coefficient is negative and insignificant in columns 1 and 2. This indicates that gross fixed capital formation does not have a significant effect on the two measures of economic growth: real GDP growth rate and real GDP per capita in Nigeria. This finding contradicts the findings of Acquah and Ibrahim (2020) who find a positive relationship between gross fixed capital formation and economic growth. The POP coefficient is positive in columns 1 and 2, but significantly related to real GDP per capita in column 2. This indicates that a larger population size has positive benefits for real GDP per capita in Nigeria. The CREDIT coefficient is positive in columns 1 and 2, but significantly related to real GDP per capita in column 2. This indicates that higher credit supply to the private sector increases GDP per capita in Nigeria.

The finding supports the findings of Ozili et al (2023b) who find a positive relationship between credit supply and economic growth.

Table 5. OLS regression: impact of FDI inflows amount on economic growth		
	(1)	(2)
	Dependent variable: *Real GDP growth*	Dependent variable: *GDP per capita*
Explanatory variables	Coefficient (t-statistic)	Coefficient (t-statistic)
FDIN	-0.629 (-0.36)	-6.355 (-0.24)
INF	-1.654** (-3.95)	-0.581 (-0.09)
INT	-1.136** (-3.03)	21.290** (3.73)
GFCF	-0.607 (-1.97)	2.752 (0.58)
POP	2.657 (1.05)	114.28** (2.97)
CREDIT	0.399 (0.95)	15.932* (2.48)
R^2	88.14	96.78
Adjusted R^2	73.32	92.75
Durbin-Watson Test	3.11	3.36
Results are estimated using the ordinary least square regression estimation. T-statistics are reported in parenthesis. Regression coefficients are reported above the t-statistics. ** and * denotes statistical significance at the 5% and 10% level. FDIN = logarithm of foreign direct investment net inflows amount in US$; INF = inflation rate; INT = real interest rate; GFCF = gross fixed capital formation; POP = total population size; CREDIT = domestic credit to private sector (% of GDP).		

5. Conclusion

This study examined the effect of foreign direct investment inflows on economic growth in Nigeria from 2010 to 2019. The findings showed that foreign direct investment inflows do not have a significant effect on economic growth in Nigeria. In other words, the impact of foreign direct investment inflows on economic growth in Nigeria is insignificant. The findings also hold when we use different measures of economic growth and different measures of foreign direct investment inflows.

The implication of the findings is that policy makers in Nigeria will have to focus on other drivers of economic growth other than foreign direct investment inflows. We urge the Nigerian government to diversify the economy and not rely only on foreign direct investment inflows to stimulate economic growth. Also, given the low level of development in Nigeria, we urge the Central Bank of Nigeria to control the inflation rate, real interest rate and other crucial macroeconomic indicators that were shown to be important drivers of economic growth in this study.

One limitation of the study is that the insignificant effect of FDI inflows on economic growth reported in this study may be due to the model specification or estimation technique used in the study. This creates some fruitful opportunities for future research. Future studies can use alternative estimation methods to examine the relationship between foreign direct investment inflows and economic growth. Also, future studies can breakdown the components of FDI inflows, and analyse how the individual components affect the various measures of economic growth. Future studies can also examine the contribution of financial sector development in moderating the FDI-growth relationship. It would also be interesting to examine whether FDI inflows are affected by foreign exchange regulations in Nigeria.

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