

## MACROECONOMIC DETERMINANTS AND FOREIGN DIRECT INVESTMENTS IN NIGERIA

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### ABSTRACT

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The main objective of this research is to investigate the impact of selected macroeconomic variables on foreign direct investment (FDI) inflow in Nigeria. The macroeconomic variables selected are exchange rate, inflation rate, monetary policy rate and gross domestic product growth rate. These variables were used as the repressors. FDI comprised the amount of inflow between 1986 and 2020. FDI was used as the dependent variable. This study employed Autoregressive Distributed Lag (ARDL) technique because the model variables were integrated at mixed order of both level and first difference. The ARDL bounds test for cointegration revealed that the selected macroeconomic variables and FDI were bound by a long-run relationship. The estimated short-run coefficients indicated that inflation and exchange rate were the major macroeconomic variables that significantly reduced FDI inflow in Nigeria while GDP growth rate and monetary policy rate were positive and significant. In the long-run, GDP growth rate and exchange rate exerted positive impact on FDI inflow while the impact of monetary policy rate was negative and significant. Following these empirical result obtained, the researcher recommends that monetary authorities in Nigeria should ensure robust GDP growth, exchange rate stability and effective monetary policy rate to attract FDI into Nigeria and formulate effective foreign exchange policies that will be attract foreign investors.

**Keywords:** FDI, macroeconomic variables, economic size, exchange rate, inflation, monetary policy rate

### INTRODUCTION

Foreign direct investments (FDI) can be critical in enhancing international capital flows which are necessary to enhance domestic resources in the growth and development process

of developing countries of the world and bring about bridging the gap that exist between savings and investments (Adebayo, Onyibor and Akinsola, 2021). It is obvious that developing and less developed countries of the world to a large extent depend on financial assistance from their developed counterparts in terms of FDI inflows that would assist them to achieve and attain certain level of economic stability. The economically developed countries can support and enhance these less developed and developing economies by investing in these countries. This financial assistance can be channeled into various sectors of the economy through partnership with the host country. It is the place of the host country to provide enabling environment void of insecurity and adverse economic policies that may deter prospective investors from coming into the host country to invest. It is also important to note that indigenous private sector companies may not often times have the financial resources for embark on certain kinds of investment in their country, hence rely heavily on the foreign companies or individuals to carry out these kinds of investments that demands huge capital outlay (Emenuga, 2019). Apart from lack of huge capital outlay to finance certain projects or investments that demand huge capital outlay, indigenous investors shy away from investments that yields revenue in the long-term and embrace those that yields revenue in the short-term and may even require lesser capital to execute. This is where FDI plays a critical role.

The inflow of FDI into any economy brings about several economic benefits such as enhanced capital inflows which will improve the balance of payment position of the host country, increase in exports, quick and rapid transfer of technology, new style of management skills and increment in employment rate in the host country (Karau and Ng'ang'a, 2019; Ndubuisi, 2017). Oloyode and Kolapo (2018), noted that FDI since 1990 have emerged as a boom to developing countries in promoting industrialization, growth, and development. It is interesting enough to compare the growth trends of trade and investment in perceiving the dynamics of international business in the world economy in the years corresponding to a millennium era. A rising trend in FDI helps in augmenting productive resources, filling the technological gap and overcoming capital shortage to facilitate the growth process of development.

Studies have revealed that foreign investors are attracted to economies where there is low investment risk and macroeconomic stability in terms of stable price, high GDP growth rate, less exchange rate swings, moderate interest rate and much more. Unfortunately, a closer observation of the Nigerian situation shows a high level of macroeconomic instability arising from various shocks to these aforementioned macroeconomic variables. For instance, the recent issue of oil price fall which emanated due to the collapse in the global price per barrel of oil, this situation has caused a significant reduction of Nigeria's external reserve as well as the GDP growth rate which latter translated to high rate of inflation and fall in the purchasing power of the naira, leading to exchange rate instability in the country and this picture does not favour foreign investors. The report of the Organization for Economic

Co-Operation and Development (OECD) reported that domestic macroeconomic swings accounts for considerable slump in FDI in developing countries like Nigeria (OECD, 2019).

Numerous studies have been done concerning the impact of macroeconomic variables on FDI in Nigeria. Emenuga (2019), found that real exchange rates, interest rates, inflation and money supply (M3) shocks have significant and persistent impacts on FDIs. Adebayo et al. (2021), also found that inflation and prime lending were negatively correlated with growth in Nigeria. Also, Onakoya (2016) found that prevailing exchange rates, interest rates, inflation and money supply have caused hindrance to FDIs in Nigeria. In Kenya, Karau and Ng'ang'a (2019) found that debt servicing, financial and human capital development, and exchange rate were significant determinants of FDI. Other studies on the subject include, among others; Ukachukwu and Odionye, (2020); Ýlyas and Merve, (2018); Kwoba and Kibati, (2016), who all confirmed a significant relationship between macroeconomic dynamics and FDI, but they did not single out any particular variables that exert the highest impact. Nevertheless, it is notable that while different studies do agree that GDP, interest rates, inflation, exchange rate, amongst others do affect the level of economic growth, this assertion varied across the works.

The puzzle in the literature is that Nigeria and countries across the world and at different times respond differently to the vagaries of the macroeconomic environment. This explains why authors from different countries emphasized diverse macroeconomic variables, resulting in a mix bag. The focus of this study is to empirically investigate the impact of macroeconomic variables on FDIs in Nigeria. This justifies the need to empirically study how macroeconomic variables impact the FDIs in Nigeria.

## **THEORETICAL FRAMEWORK**

This study is anchored on eclectic theory. According to Dunning (2000), eclectic theory states that firms undertake foreign direct investment when the features of a particular location combine with ownership and internationalization advantages to make location appealing for investment. Nigeria has become a preferred destination for foreign direct investment due to her strength in connectivity with most parts of the continent and the world as well. This is so because of her geographical location, in particular Apapa Seaport and oil producing zones which is preferred by most of the investors as reliable and secure in all other aspects to satisfying the shipping needs, transport is one of the essential aspects of business given the cost involved.

## **EMPIRICAL REVIEW**

Adebayo, Onyibor and Akinsola (2021) explored the linkages that existed between FDI inflows and selected macroeconomic indicators (gross capital formation, export, inflation, trade openness and economic growth) utilizing yearly time series data between 1981 and

2018. The study used ARDL technique to ascertain the linkages that exist between FDI inflows and its determining indicators. Furthermore, the wavelet coherence techniques were used. Robustness check was conducted using FMOLS and the DOLS to consolidate on the ARDL long-run estimation. The findings elicited from the ARDL long-run estimate showed that exports and trade openness exerted positive impact on FDI inflows. The findings from the FMOLS and DOLS were in congruence with the ARDL results.

In another study, Ukachukwu and Odionye (2020) examined the impact of selected macroeconomic variables on foreign direct investment in Nigeria from 1981 to 2017. The researchers employed the Auto-Regressive Distributed Lag (ARDL) bound co-integration model to examine both the short run and long impacts of the selected variables on FDI. The bound co-integration test result showed evidence of long-run relationship that exist between FDI and selected macroeconomic variables in the country. The ARDL model results revealed that foreign exchange rate and crude oil prices recorded a significant positive influence on FDI in the country both in the short run and in the long-run. The result further revealed that inflation recorded significant negative impact on FDI both in the short and long-run. The results also revealed that while real gross domestic product recorded significant positive influence on FDI in the short run, its long-run effect was found to be insignificant. In view of the empirical result, the researchers recommended that government should formulate policies that will bring about price stability and stability in the macroeconomic environment.

Wijaya, Astuti, Tarigan and Edyanto (2020) investigated the influence of macroeconomic indicators and infrastructure spending on foreign direct investment (FDI) between 1981 and 2018. This study used a quantitative approach. The variables used in this study include gross domestic product, exchange rate, debt to GDP ratio, inflation rate, interest rates and infrastructure spending. The researchers employed cointegration and error correction modeling as estimation techniques. The results shows that all the variables had both long-term and short-term relationship to FDI.

Artanta<sup>o</sup> and Sipahi (2020) examined the effect of selected macroeconomic variables on investments inflow in Turkey. Also, this study focused on Foreign Direct Investment (FDI) inflows and how they are linked with the economic indicators in Turkey including the Real Effective Exchange Rate (REER), and GDP per capita of Purchasing Power Parity - GDP (PPP) in Turkey. Data for the study were collected from the Central Bank of Turkey statistical bulletin (1994 – 2018). Variables examined were exchange rates, inflation rates, interest rates, government deficit. Findings revealed that all the explanatory variables jointly impact on foreign direct investment inflow. Government deficit, exchange rates have a significant positive effect on FDI in Turkey. Therefore, Government should evolve sound policies that would strengthen the attraction of Foreign Direct Investment Inflow in Turkey by paying more attention to the identified macroeconomic policy variables.

Emenuga (2019) studied the impact of macroeconomic variables on FDI flow in Nigeria from 1986 to 2017. Data on FDI, GDP, government size (GOVT), exchange rate (EXR), inflation rate (INF) and interest rate (INT) were sourced from CBN Annual report. ARDL cointegration bound test and error correction model (ECM) estimation techniques were employed. The finding of the ARDL revealed that exchange rate, interest rate, gross domestic product and government size were all significantly related to FDI in Nigeria. The study concluded that there exists a long-run relationship between macroeconomic variables and FDI in Nigeria and recommended that The Nigerian government should foster economic policy capable of attracting more foreign direct investment into the country.

Meftah and Nassour (2019) examined what factors influence FDI. By using the vector error correction model, the research shows that there is a long-term causality relationship between exchange rates and inflation with FDI. However, in the short term, there are no variables that affect FDI. Besides, the Granger causality test shows causality in the direction of GDP and FDI, while other variables do not have causality. This research has implications for policymakers to pay attention to macroeconomic variables in increasing the flow of FDI.

Karau and Ng'ang'a, (2019) examined the effects of macroeconomic factors on FDI in Kenya (FDI). The study used four macroeconomic variables namely foreign exchange rates, tax rates, inflation rates, interest rates and balance of payment for the period 1970 to 2010. The study used a multiple linear regression analysis with the FDI inflows as the dependent variable and the macroeconomic factors as the independent variables. The study found a positive relationship between FDI and interest rates as well as balance of payments while inflation and tax rate had negative relationship with FDI. The study recommended that the government should promote a stable macroeconomic environment in the country to enhance FDI inflows.

## METHODOLOGY

Following the dynamics of time series data, ARDL model was applied for the investigation of the impact of macroeconomic variables on FDI in Nigeria. The functional relationship of the model is given as shown in equation 3.1:

$$FDI = f(GDP, EXR, INF, MPR) \quad (3.1)$$

All the variables are in logarithm form. ARDL model was chosen based on its advantages over other models. The ARDL model which employs a bounds test method based on the error correction model (ECM) was used here to test for a long run relationship among the model variables. This model was applied by Pesaran, Shin and Smith (2001) and the main advantage of this approach is underpinned by the fact that it can be utilized irrespective of whether the variables are I(0) or I(1) or a mix of both. This also permits for



the variables (FDI, GDP, EXR and MPR) were integrated of the order one, that is, I(1) whereas only INF was integrated of order zero, I(0). Since the variables achieved stationarity at order one and zero and none of them integrated of order two. Therefore, the ARDL bound test approach recommended by Pesaran et al. (2001) in a situation where the variables are of I(0) and I(1) was applied for the estimation. After twenty models were generated automatically, ARDL(3, 3, 1, 1, 2) was chosen based on Akaike information criteria (AIC).

**Table 1: ADF test results**

Variable	ADF test statistic		ADF critical values		Order of integration
	Level; I(0)	1 <sup>st</sup> diff., I(1)	1%	5%	
FDI	-2.651992	-10.57471	-4.252879	-3.548490	I(1)
GDP	-0.911181	-3.630261	-4.252879	-3.548490	I(1)
EXR	-2.545927	-6.012188	-4.252879	-3.548490	I(1)
INF	-4.683108	—	-4.252879	-3.548490	I(0)
MPR	-3.290941	-6.998435	-4.252879	-3.548490	I(1)

Source: Researcher's analysis using e-views 9 output

An important condition necessary for testing ARDL bounds is that each of the variable be integrated of order one or zero or both. Since the variables are integrated of mixed order of I(0) and I(1), the study proceeded with the ARDL bounds test. The null hypothesis for the bounds test is that the variables are not co-integrated as against the alternative that they are co-integrated. The decision rule is to accept the null hypothesis if the F-statistic is greater than the upper bound critical values at chosen level of significance. The result of the ARDL test is shown in Table 2:

**Table 2: ARDL bounds test**

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.014388	10%	2.2	3.09
K	4	5%	2.56	3.49
		1%	3.29	4.37

Source: Researcher's analysis using e-views 9 output

Table 2 the F-statistic is 5.014388 which is greater than the upper bound, I(1) of 4.37 at 1% level of significance. Thus, the null hypothesis was rejected and the study concludes that there is long run relationship in the model. This implies that there is a co-integrating relationship between FDI and selected macroeconomic variables (GDP, EXR, INF and MPR) in Nigeria.

Since there is long run relationship between FDI and selected macroeconomic variables, the results of the short run and long run estimates of the ARDL regression were presented in Tables 3 and 4 respectively:

**Table 3: Short-run estimates and error correction mechanism (ECM)**

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
DLOG(FDI(-1))	-0.370090	0.136507	-2.711137	0.0139
DLOG(FDI(-2))	-0.231565	0.127973	-1.809477	0.0862
DLOG(GDP)	0.287898	0.558323	0.515648	0.6120
DLOG(GDP(-1))	2.329688	0.633985	3.674673	0.0016
DLOG(GDP(-2))	1.997146	0.753959	2.648878	0.0158
D(EXR)	0.636800	0.199558	3.191052	0.0033
D(INF)	-0.178020	0.077095	-2.309099	0.0209
DLOG(MPR)	-0.444940	0.254382	-1.749104	0.0964
DLOG(MPR(-1))	0.430407	0.231901	1.855997	0.0790
ECM-1)	-0.974240	0.158035	-6.164721	0.0000
R-squared	0.824221			
Adjusted R-squared	0.772952			
Durbin-Watson stat	2.165346			

*Source:* Researcher's analysis using e-views 9 output

From Table 3, the estimated coefficient of the past value of FDI is negative and statistically significant meaning that the current value of FDI was affected negatively by its immediate past status. In other words, what determines the current value of FDI is its past value.

The estimated coefficients of GDP lag one and EXR were positive and statistically significant implying that changes in exchange rate and economic output attract FDI into Nigeria. This is in consonance with the *a priori* expectation suggesting that depreciation in exchange rate makes FDI in the host economy cheaper and attractive which will accelerate FDI into the future. In the case of GDP which implies a persistence increase in economic output will accelerate aggregate demand and in turn pull FDI. This result aligns with the findings of Ukachukwu and Odionye (2020); Emenuga (2019); Oloyede and Kolapo (2018) that exchange rate depreciation and economic production drives FDI into Nigeria.

The MPR had a negative and insignificant effect on FDI; a positive and significant effect on FDI. It then implies that the regular manipulation of monetary policy to manage macroeconomic processes in Nigeria have largely failed to pull FDI. This finding is largely attributed to inconsistencies in monetary policy by the recipient country's government according to prior empirical studies (Nwokoye and Oniore, 2017). It then implied that foreign capital might not flow to countries where monetary policy has been inconsistent.

As expected, inflation inversely and significantly affected FDI in Nigeria. This indicates that a rise in inflation would cause a decline in FDI as investment decisions become difficult and uncertain and hence a deceleration in FDI. This result supports the finding of Ndubuisi (2017) who studied the determinants of FDI in Nigeria and their result showed, *inter alia*, that inflation as the major determinant of FDI in Nigeria.

The coefficient of ECM (-1) is (-0.97) and is appropriately signed. This speed of adjustment implies that about 97% of the previous year's disequilibrium in FDI is corrected yearly by the macroeconomic variables such as GDP, EXR, INF and MPR. The implication is that it will take approximately one year for any disequilibrium in FDI to be corrected by selected macroeconomic factors.

The coefficient of multiple determination is 0.772952, indicating that approximately 77.2% of the variations in FDI is explained by the explanatory variables (selected macroeconomic variables) in the model. This further indicate a good explanatory power of the empirical model.

**Table 4: Long-run estimates**

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
LOG(GDP)	0.434280	0.167477	2.593069	0.0178
LOG(EXR)	0.689364	0.237791	2.899031	0.0092
LOG(INF)	0.040474	0.082118	0.492874	0.6277
LOG(MPR)	-1.639199	0.370498	-4.424315	0.0003
C	1.655344	1.479834	1.118601	0.2773

*Source:* Researcher's analysis using e-views 9 output

The long-run estimates from Table 4 shows that, GDP, exchange rate and inflation has positive and significant effect on FDI in the long-run while MPR had a negative effect on FDI. GDP, EXR and MPR had a statistically significant effect on FDI in the long-run while INF did not exert a significant effect on FDI in the long run in Nigeria.

**Table 5: Diagnostic and stability tests**

<i>Test</i>	<i>F-statistic</i>	<i>Prob.</i>
Breusch-Godfrey Serial Correlation LM Test:	2.021238	0.1631
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.840156	0.6128
Ramsey RESET Test	0.788954	0.4395
Normality Test	1.441281	0.4864

*Source:* Researcher's analysis using e-views 9 output

The results of the diagnostic tests presented in Table 5 investigated the presence or absence of serial correlation in the residuals generated from the models, Ramsey model specification test, heteroskedasticity test and stability test as well as the normality test. The serial correlation tests of the residuals were based on the Breusch-Godfrey LM test for autocorrelation. The estimated model Result from the second order tests indicates no evidence of serial correlation in the model. Also, the Ramsey reset test result indicates no evidence of omitted variable problem in the results and the Harvey Heteroskedasticity test shows no evidence of heteroskedasticity in model. In the same vein the normality test shows that the residual was normality distributed.

## CONCLUSION AND RECOMMENDATIONS

This study was carried out to ascertain the impact selected macroeconomic variables had on FDI in Nigeria using ARDL model. The empirical findings suggested that GDP and exchange rate exerted positive and statistically significant effect on FDI both in the short run and in the long run. It further indicated that inflation negatively and significantly affect FDI in the short run but turned positive and insignificant in the long-run. On the contrary, MPR has a negative and significant effect on FDI in the short-run but the effect was insignificant in the long-run. In summary, it is the researcher's opinion that the empirical evidences realized in this study is sufficient to submit that macroeconomic variables had significant impact of foreign direct investment in Nigeria within the review period.

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