

Impact of Macroeconomic Variables on Foreign Direct Investments in Nigeria

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Abstract

This study examines the impact of macroeconomic variables on foreign direct investment in Nigeria from the period of 1985-2020. Autoregressive Distributed Lag (ARDL) and Granger causality tests were employed. The result from ARDL shows that foreign direct investments are majorly determined by the real gross domestic product, exchange rate, interest rate and degree of openness. The Granger causality test indicates evidence of unidirectional causation which flows from exchange rate, inflation rate and degree of openness to foreign direct investment while no evidence of causality was found among other variables. Based on this, the study recommends that policymakers should put in high esteem economic growth and development in the country and this should be corroborated by a consistent exchange rate to increase investors' confidence through a healthy and secured exchange rate management. Interest rate fluctuation should be curtailed by the monetary policy.

Keywords: Foreign Direct Investments, Exchange Rate, Inflation Rate, Degree of Openness

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1.0 INTRODUCTION

Macroeconomic variables and the dwindling inflow of foreign investment in a growing economy have posed much concern to policymakers, government, and academia in general. Investments whether from domestic sources or abroad stimulate the economic development of a country (Das, 2018). Countries with limited accumulation of capital coupled with a low level of technological advancement usually experienced shrinking growth compare to countries with a high pedigree for capital inflow. The desire for external capital inflows in a country, therefore, exists when its domestic investments surpass actual savings. This inflow of capital from other countries bridges the savings-investment gaps in most capital-resource deficient economies. Foreign Direct Investments (FDIs) therefore provide one of the major sources of foreign capital (Udo & Obiora, 2006; Ogunleye, 2008; Ajayi, Akinbobola, Okposin & Ola-David, 2016).

FDIs represent a non-debt inflow of foreign capital in the host country. They can generate potential growth attributes such as employment creation, channel resources, and technology to the recipient country, ameliorate skills and managerial knowledge, increase efficiency in productivity, and above all stimulate the potential growth in the economy (Lipsey, 2000; Kiyota & Urata, 2004; McAleese, 2004; Li & Liu, 2005; Wang, 2012; Enu, Havi & Attah-Obeng, 2013; Obidike & Uma, 2013; Kwoba & Kibati, 2016; Das, 2018). However, to enjoy these benefits, the recipient country must have the enabling environment that can best domesticate and secure these advantages. However, not all developing countries like Nigeria possess these capabilities, as rightly observed by Egbunike and Okerekeoti (2018) that despite the efforts made by the government to provide incentives to numerous investors, most of them still find it difficult to invest in Nigeria. These are due to unpredictable macroeconomic variables, social, political, and economic crises ravaging the country. Since the inflow and growth of foreign investments largely rely on stability in macroeconomic interaction in the recipient country, ensuring resistance to changes in these economic variables prevents to a large extent the risk involved in foreign investment.

However, macroeconomic variables such as inflation rate, rate of unemployment, gross domestic product, stock market index, interest rates, exchange rate, trade openness, market capitalization, financial sector development, among others can either positive or negatively influence investment in the host country (Egbunike & Okerekeoti, 2018). A favourable monetary policy of a country that creates a conducive environment for business will attract FDIs while fiscal policies in the host country also affect the company's after-tax net cash flow, the potential demand for its products, and its survival (Aghion, Bacchetta, Ranciere & Rogoff, 2006; Zeitun, Tian & Keen, 2007). Also, depreciation in the exchange rate increases the capacity of foreign investors to acquire more assets. This is made possible due to the increase in wealth accompany depreciation. Also, foreigners may however lose as a result of information asymmetry which may cause a divergence from their financing mode (internal and external). Moreover, unfavourable interest rate is likely to affect the inflow of capital while an attempt to reduce the rate of interest would lead to a relatively weak Naira internationally.

Financial sector development also affects the inflow of foreign investments since it assists in suppressing the degree of economic variability (Elly & Ojung'a, 2013). The uncertainty in these economic variables indicated that for investing in foreign countries, potential investors are naturally exposed to different types of risk.

Unfavourable economic variables have further been proved in literature as an obstruction to foreign capital inflow (Egbunike & Okerekeoti, 2018). As a result of frequent movement in macroeconomic variables, several policy changes were introduced since the 1980s to enhance not only domestic investment but also foster an increase in foreign direct investment. Despite these dosages of reforms, the volume of total inflow in Nigerian FDIs to GDP is still low compare to other African countries (Aghion, Bacchetta, Ranciere, & Rogoff, 2006; Ajayi, Akinbobola, Okposin & Ola-David, 2016; Enisan, 2017). The ineffectiveness of these trade policy reforms to attract sufficient FDIs as well as the increasing fluctuation in the macroeconomic variables has prompted a re-evaluation of the effects of these variables on FDIs in Nigeria.

Studies have extensively been conducted on macroeconomic variables and foreign direct investment in developed and other developing economies with mixed results. For instance, Loksha and Leelavathy (2012) observed that macroeconomic variables determine the flow of foreign capital. Imoughele (2016) notes that the variables that affect the inflow of foreign investment in Nigeria are credit to the private sector, gross domestic product and exchange rate while Zaristan (2016) is of the view that interest rate and exchange rate are the variables that influence inflow of investment Otieno and Njuguna (2016) found no significant relationship among exchange rate, interest rate and inflation on the inflow of foreign direct investment. In line with the numerous empirical evidence nationally and internationally, the subject matter is still unresolved and open for further discussion. These differences in findings might be attributed to the variant in variables, time frame, estimation techniques, and country-specific characteristics.

However, empirical findings from these existing studies are inconclusive. More so, there is little empirical evidence on how macroeconomic variables affect the inflow of foreign direct investments in Nigeria. Most Nigerian studies such as Egbunike and Okerekeoti (2018); Oregwu and Onuoha (2013); Obidike and Uma (2013) concentrated on either determinant of foreign direct investments using aggregate exchange rate or the effects foreign direct investments have on the economy using gross domestic product, thereby, depriving these studies of knowing the extent to which macroeconomic variables affect the inflow of investment in Nigeria. In addition to this, the granger causality test was conducted to know variables that granger causes one another. Therefore, the thrust of this study is to examine macroeconomic variables and foreign direct investments in Nigeria.

Following this introduction is the review of literature which is followed by materials and methods, and the next section gives an analysis of data and interpretation while the last section provides the conclusion and recommendations that emanated from the study.

2.0 LITERATURE REVIEW

2.1 Theoretical Literature

Literature has recorded a wide range of theories in the field of international capital. Included in this aspect are the Neoclassical Trade Theory, the Hecksher-Ohlin Model, Horizontal FDI Model or Proximity-Concentration Hypothesis, the Diversified FDI and risk Diversification Model, the Internationalization Model and Monopolistic Competition Theories. Given the deficiency in each theory in explaining the impact of macroeconomic variables on FDI, this research work is hinged on Dunning's (1977, 1981, 1995, and 2009) eclectic paradigm theory, popularly known as OLI or eclectic approach. Dunning opined that for a firm to invest in foreign countries, it must be triggered by three main factors such as ownership, location, and internalization (OLI) benefits. Ownership benefits comprise of factors like firm-specific assets, competitive benefits, and it's standardized technological and management know-how which company from abroad has over domestic companies. Locational benefits are the host country-specific advantages. The benefits may be tangible or intangible resources attracted to the host environment. They are increased labour supply at a reduced cost, availability of local materials, government regulations, transport costs, macroeconomic stability, cultural factors, and other favourable investment environment in the host country. While internalization benefits tend to exploit imperfection in external markets, which may be a reduction in transaction cost and uncertainty. It should however be noted that locational benefits of the host country is regarded as the most crucial factor for most empirical studies in time past and still relevant till today (Aghion, Bacchetta, Ranciere & Rogoff, 2006; Asamoah, 2012; Ajayi, Akinbobola, Okposin, & Ola-David, 2016; Enisan 2017; Das, 2018).

2.2 Empirical Review

Using data covering the period of 1981-2017, Ukachukwu and Odionye (2020) examined the influence of macroeconomic variables on foreign direct investment in Nigeria. Autoregressive Distributed Lag (ARDL) test was used in their analysis. The result indicated that prices of crude oil and exchange rate exhibited positive and significant relationship with inflow of investment both in the short and long-run. Real gross domestic product depicted significant positive relationship in the short run but drifted apart as it revealed insignificant on the long-

run.

Oudat, Hasan and Alsmadi (2020) examined the effect of macroeconomic variables on portfolio investment in Bahrain. The study employed Autoregressive distributed lag (ARDL) on data ranging from 1989-2018. The result confirmed the existence of long-run relationship and also discovered that consumer price index coupled with gross domestic product cause portfolio investment in the long-run. Out of all variables employed, only consumer price index statistically significant in explaining portfolio investment in the short-run.

Adokwe, Agu, Maduka (2019) investigated how volatility of exchange rate affects inflow of investment in Nigeria from 1986-2016. The study used 2 Stage Least Square coupled with generalized autoregressive conditional heteroscedasticity (GARCH). The findings revealed that exchange rate volatility is inimical to the inflow of investment in Nigeria.

Meftah and Nassour (2019) conducted a study on macroeconomic variables and the inflow of investment using Turkey as a case study. The study employed Vector Error Correction Model and found that no variables employed in the model affect the inflow of investment while long-run causal relationship exist between exchange rate, inflation rate and foreign direct investment. The causality test indicated that the direction of causality is from economic growth to foreign direct investment while no causal relationship is found among other variables. Das (2018) analyzed uncertainty in macroeconomic and how it affects foreign direct investments in developing countries using a non-dynamic panel model. The study employed the ARCH (GARCH) technique for twenty-eight (28) developing countries in his empirical analysis. Results showed that the impact of macroeconomic uncertainty on FDIs fluctuates with the income level of the host country while variables such as GDP growth, trade openness and FDI stock significantly influenced FDI inflow towards an economy.

Oloyede and Kolapo (2018) examined the reaction of foreign direct investment to the behaviour of macroeconomic variables in Nigeria. The study employed descriptive, correlation and ordinary least square. It was revealed from their findings that inflation rate, trade openness and population exhibited significant positive relationship with inflow of investment in Nigeria, real gross domestic product depicted significant negative relationship while interest rate and exchange rate indicated negative insignificant relationship. Ndugbu, Duruechi and Ojiegbe (2017) investigated macroeconomic variables and foreign direct investments (FDIs) in Nigeria. The study employed Vector Auto Regression (VAR) analysis while their findings indicated that rate of interest, rate of inflation and economic growth have a significant positive influence on foreign direct investments in Nigeria.

Enisan (2017) used the Markov regime-switching approach to determining foreign inflow of investment in Nigeria. The result indicated that the main factors that determine FDIs in Nigeria are GDP growth, macroeconomic instability, financial development, exchange rate, inflation and discount rate. It was also showed from the result that the process of FDI in Nigeria is determined by two regimes shift.

Nwinee and Olulu-Briggs (2016) examined capital inflow and macroeconomic dynamics in Nigeria using co-integration and Granger causality test. Empirical results of the study indicated the existence of a long-run relationship among the variables while the causality test indicates a unidirectional causal link among interest rate, inflation rate and foreign direct investment while rate of interest and rate of inflation depict bi-directional causality. Imoughele (2016) examined macroeconomic manipulation of foreign investment inflow in Nigeria for the periods ranging from 1986-2012. The study employs co-integration techniques. The result shows the existent of a long-run relationship between FDI inflows and macroeconomics variables. The variables that affect the inflow of foreign investment in Nigeria are credit to the private sector, gross domestic product and exchange rate.

Kwoba and Kibati (2016) examined how macroeconomic variables have impacted foreign direct investments in Kenya. Descriptive, correlation, and regression analysis of ordinary least square (OLS) were adopted to examine the relationship among three variables such as exchange rate, rate of inflation, GDP and inflow of FDIs while frequency and percentages were utilized to know the perception of people towards FDIs in Kenya. OLS results indicated that rate of exchange, gross domestic product and inflation rate negatively affect FDI inflows while it was also found that Kenyans perceived FDIs as market-seeking investments. Otieno and Njuguna (2016) examined the factors that influence macroeconomic variables in attracting inflow of foreign investment in Kenya from 2002 to 2013. The study employed correlation and simple regression analysis. They found that development expenditure depicts a positive relationship while variables such as exchange rate, interest rate, and inflation exhibited a negative relationship on the inflow of foreign direct investment.

Zaristan (2016) examined how a foreign direct investment is affected by macroeconomic variables in Pakistan for the periods 1980-2014. The study employed ordinary least square regression techniques. The result showed that a negative and significant relationship exists among interest rate and exchange rate while industrial development and trade openness depict an insignificant relationship on foreign direct investment. Akanbi (2015) investigated the influence of macroeconomic variables on the unemployment rate in Nigeria using Vector Autoregressive (VAR) and Granger causality test on data sets for 1985-2010. Result reveals that positive shocks to gross domestic product increased unemployment rate while shocks to foreign direct investment, inflation rate, money supply, and lending rate reduce the unemployment rate in Nigeria. The causality test showed that the inflation rate depicts a bi-directional relationship with the unemployment rate in Nigeria.

Maku (2015) examined the consequences macroeconomic might have on foreign direct investments in Nigeria. The study employed Engel-Granger co-integration and causality test for the periods 1980-2012. The result showed that the sizes of the market, trade openness and infrastructure have a significant and positive effect on the inflow of foreign direct investments while political instability negatively affects FDIs in Nigeria. Faroh and Shen (2015) examined the extent to which interest rates affect the inflow of foreign investment in Sierra Leone from 1985 to 2012 using correlation analysis. Their results indicated that openness of the economy and volatility in the rate of exchange are determinants of foreign direct investments as the two variables exhibited a positive and significant relationship while gross domestic product, interest rate and inflation rate were found to be insignificant in Sierra Leone.

Furthermore, Oregwu and Onuoha (2013) examined foreign direct investment and the Nigerian economy from the 2001 to 2010 periods. The study employs ordinary least square analysis on variables such as real gross domestic product, inflation rate, trade openness, electricity consumption, transport and communication. The result indicated that real gross domestic product, inflation rate and electricity consumption are negatively related to the inflow of foreign direct investment. Enu, Havi and Attah-Obeng (2013) investigated macroeconomic factors and foreign direct investment in Ghana using co-integration techniques and VAR analysis. Results from the analysis indicated that lag one of foreign investment, lag two of the exchange rate, and openness of the economy were statistically significant.

Asamoah (2012) examined the influence of macroeconomic volatility on foreign direct inflow in Africa using the ARCH and GARCH Model for volatility measurements and dynamic panel estimation method. Results from the findings indicated a significant negative relationship among volatility in the exchange rate, volatility in inflation and volatility in interest rate while trade openness and human capital indicate positive and significant influence on foreign direct investment. Wang (2012) examined the volatility in the exchange rate and foreign investments among Brazil, Russia, India, and China (BRIC) countries. The study applied monthly changes in exchange rate with the aid of standard deviation, ARDL techniques, and Co-integration for all countries. Results from the findings indicated that FDI was negatively affected by the exchange rate in the long-run for India and Russia; China, India, and Russia experienced short-run association while there is no connection between the variables in the long-run. Udo and Obiora (2006) analyzed the determinants of foreign inflow and economic growth among West Africans with the aid of system equations between the periods of 1980-2002. They found that FDI depends on market size, GDP growth rate, political instability, and inflation rate.

Sequel to all these empirical studies, it is evident that consensus has not been reached on the subject matter. This has paved the way for this study to justify the types of relationships and the direction of causality that subsist among macroeconomic variables and foreign direct investments in Nigeria.

3.0 MATERIALS AND METHODS

The study used annual time series data ranging from 1985 to 2020. The data was obtained from CBN Statistical Bulletin and Nigeria Stock Exchange various issues. Data were first analyzed using Augmented-Dickey-Fuller (ADF) unit root test and the result obtained from the unit root test guides the study on the use of Autoregressive Distributed Lag (ARDL) estimation techniques. Also, the variables that cause one another were examined using Granger causality. This estimation technique was employed to examine the linear causation between the concerned variables.

Model Specification

This study derived its model from the work of Nwinee and Olulu-Briggs (2016). However, it departs from the study of Nwinee and Olulu-Briggs (2016) by including macroeconomic variables that are theoretically and empirically informed and have a deterministic impact on foreign direct investment. The model for the study is hereby specified as follows:

$$FDI = f(MEV) \dots\dots\dots 3.1$$

Decomposing *MEV* in equation 3.1, the study has

$$FDI = f(RGDP, EXGR, INFR, INTR, DOP, MCP) \dots\dots\dots 3.2$$

From equation 3.2, it can further be stated in more explicit form as:

$$FDI = f(\beta_0 + \beta_1RGDP + \beta_2EXGR + \beta_3INFR + \beta_4INTR + \beta_5DOP + \beta_6MCP + \mu) \dots\dots 3.3$$

Where:

- FDI* = *Foreign Direct Investment*
- MEV* = *Macroeconomic Variables*
- RGDP* = *Real Gross Domestic Product*
- EXGR* = *Real Exchange Rate*
- INFR* = *Inflation Rate*
- INTR* = *Interest Rate*
- DOP* = *Degree of Openness*

MCP = Market Capitalisation
 μ = Error term
 $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 = Coefficients of the Estimates

Table 3.1 Employed Variables and their Relationship Based on Theories

Dependent Variable	Independent Variables (Macroeconomic Variables)	Expected Relationship
Foreign Direct Investment (FDI)	Real Gross Domestic Product (RGDP)	+
	Real Exchange Rate (EXGR)	+/-
	Inflation Rate (INFR)	-
	Real Interest Rate (INTR)	-
	Degree of Openness (DOP)	+
	Market Capitalisation (MCP)	+

Source: Author's Computation, 2022

4.0 DISCUSSION AND FINDINGS

Results of Data Analysis

The analysis begins with the examination of the variables using Augmented Dickey Fuller (ADF) test as indicated in Table 4.1

Table 4.1: Augmented Dickey Fuller (ADF) Unit Root Test

Variables	ADF			Order of integration
	Critical values @5%	t- statistics	Prob.	
FDI	-2.951125	-7.318378	0.0000	I(1)
RGDP	-2.951125	-2.977581	0.0472	I(1)
EXGR	-2.948404	-4.383940	0.0014	I(0)
INFR	-2.948404	-3.053762	0.0396	I(0)
INTR	-2.948404	-4.109272	0.0029	I(0)
DOP	-2.948404	-3.225875	0.0268	I(0)
MCP	-2.951125	-4.577346	0.0008	I(1)

Source: Author's Computation, 2022

The Augmented Dickey-Fuller (ADF) unit root test for all the variables are duly reported in Table 4.1. From the result, variables such as real exchange rate, inflation rate, real interest rate, and degree of openness have no unit root as all were found integrated of order zero I(0), while foreign direct investment, real gross domestic product, and market capitalization were found stationary at first difference i.e integrated at order one I (1). The existence of different integration order from the unit root result provides an impetus for the use of Autoregressive Distributed Lag (ARDL). The next step after finding out the order of integration and before estimating the ARDL model is the determination of lags suitable for the model. This is done using Vector Autoregressive (VAR). The criterion suggestions are reported in Table 4.2

Table 4.2: Selection of Optimal Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-131.0345	NA	7.93e-06	8.119674	8.433925	8.226843
1	73.02957	312.0979	9.22e-10	-1.001740	1.512266	-0.144392
2	159.5406	96.68877*	1.50e-10*	-3.208269*	1.505491*	-1.600742*

Sources: Authors' Computation, (2022)

From Table 4.2, the number of lags suitable for ARDL model is 2. This is however considered when ARDL co-integration and causality test were carried out.

Test for Co-integration

Table 4.3 Unrestricted ARDL Model for FDI

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
C	-59.20879	20.56327	-2.879347	0.0096
FDI(-1)	0.223357	0.296933	0.752212	0.4611
FDI(-2)	-0.528500	0.266035	-1.986582	0.0616
RGDP	7.546888	2.334589	3.232641	0.0044

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
EXGR	0.698840	1.699649	0.411167	0.6856
EXGR(-1)	-3.389645	1.616303	-2.097159	0.0496
INFR	0.208998	0.475516	0.439518	0.6652
INFR(-1)	0.092056	0.416966	0.220776	0.8276
INFR(-2)	-0.786271	0.414877	-1.895188	0.0734
INTR	0.047863	1.152272	0.041538	0.9673
INTR(-1)	3.135623	1.197541	2.618385	0.0169
DOP	2.172163	0.894509	2.428330	0.0253
DOP(-1)	1.367454	0.782798	1.746881	0.0968
DOP(-2)	0.882134	0.676815	1.303360	0.2080
MCP	-0.419748	0.482461	-0.870013	0.3952

Source: Author's Computation, (2022)

$R^2 = 0.854804$; Adjusted = 0.747818; F-statistic = 7.989836; Prob. (F-statistic) = 0.000030

The essence of Table 4.3 is to provide the basis for the determination of a long-run relationship. The test of co-integration using the ARDL bound test is therefore examined. This provides an insight into the existence of co-integration in the model.

Table 4.4: Co-integration Bound Test for FDI

F-Statistic	7.678662	
Significance	I0 Bound	I1 Bound
10%	1.99	2.94
5%	2.27	3.28
2.5%	2.55	3.61
1%	2.88	3.99

Source: Authors' Computation, (2022)

Table 4.4 shows the co-integration bound test estimated model for FDI. The Table indicates that a long-run relationship can be found since the F-statistic value in the model (7.678662) is above the lower and upper bounds values at any levels of significance. By implication, the model rejects the null hypothesis of no long-run effects. Following this result, is the presentation of the short and long-run for FDI. However, since a valid long-run result is established in the model, the study will base its interpretation on the long-run result.

Table 4.5 ARDL Co-integration Regression for FDI

Variables	Coefficient	Prob.
LR RGDP	5.782421	0.0001***
EXGR	-2.061694	0.0000***
INFR	-0.371773	0.4367
INTR	2.439185	0.0305**
DOP	3.387944	0.0007***
MCP	-0.321610	0.3828
SR D(FDI)(-1))	0.574387	0.0019***
D(RGDP)	5.587322	0.0655*
D(EXGR)	0.716295	0.4328
D(INFR)	0.187722	0.4157
D(INFR(-1))	0.816831	0.0040***
D(INTR)	0.154297	0.8354
D(DOP)	2.149166	0.0016***
D(DOP(-1))	-0.918706	0.0479**
D(MCP)	-0.143192	0.7806
CoIntEq(-1)	-1.347245	0.0000***
Constant	-45.365740	0.0004***

Source: Author's Computation, (2022)

It should however be noted that ***, ** and * represent their levels of significance at 1%, 5% and 10% respectively.

Table 4.5 shows that the coefficient of the error correction mechanism (ECM) is appropriately signed given the value of -1.347245. This indicates that the level of correction from short to long-run is 135%. The result also indicated that the model adjusted rapidly as the disequilibrium in the previous year's quickly adjust to long-run

equilibrium in the current year. From the long-run result, Table 4.5 indicates that the coefficient of real gross domestic product is significant with a value of 5.782421 units. It implies that a unit increase in real gross domestic product will increase the inflow of foreign direct investment in Nigeria. In the same vein, exchange rate has a significant negative coefficient of -2.061694 units. It means that a unit increase in exchange rate will reduce foreign investment inflow in Nigeria. Inflation rate and market capitalization have a negative coefficient of -0.371773 and -0.321610 units respectively. This implies that a unit increase in inflation rate and market capitalization will reduce foreign direct investment by -0.371773 and -0.321610 units respectively. Interest rate and degree of openness have a significant positive coefficient of 2.439185 and 3.387944 units respectively. The result implies that a unit increase in interest rate and degree of openness will lead to 2.439185 and 3.387944 respective units increase in foreign direct investment in Nigeria.

Granger Causality Test

Table 4.6: Granger Causality Test

Causality Direction	Obs	F-Statistic	Prob.
RGDP → FDI FDI → RGDP	34	0.21734 1.79974	0.8060 0.1833
EXGR → FDI FDI → EXGR	34	0.50971 33.5679	0.6060 3.E-08
INFR → FDI FDI → INFR	34	2.87596 5.21114	0.0725 0.0117
INTR → FDI FDI → INTR	34	2.51053 0.24221	0.0987 0.7865
DOP → FDI FDI → DOP	34	1.25889 6.29315	0.2990 0.0054
MCP → FDI FDI → MCP	34	0.18549 2.24979	0.8317 0.1235

Sources: Author's Computation, (2022)

Table 4.6 reports the causality test which indicates whether macroeconomic variables employed and foreign direct investments have any economic predictive content on one another. The result shows that no causal relationship exists between real gross domestic product and foreign direct investment, between interest rate and foreign direct investment and between market capitalization and foreign direct investment while unidirectional causality running from exchange rate, inflation rate and degree of openness to foreign direct investment.

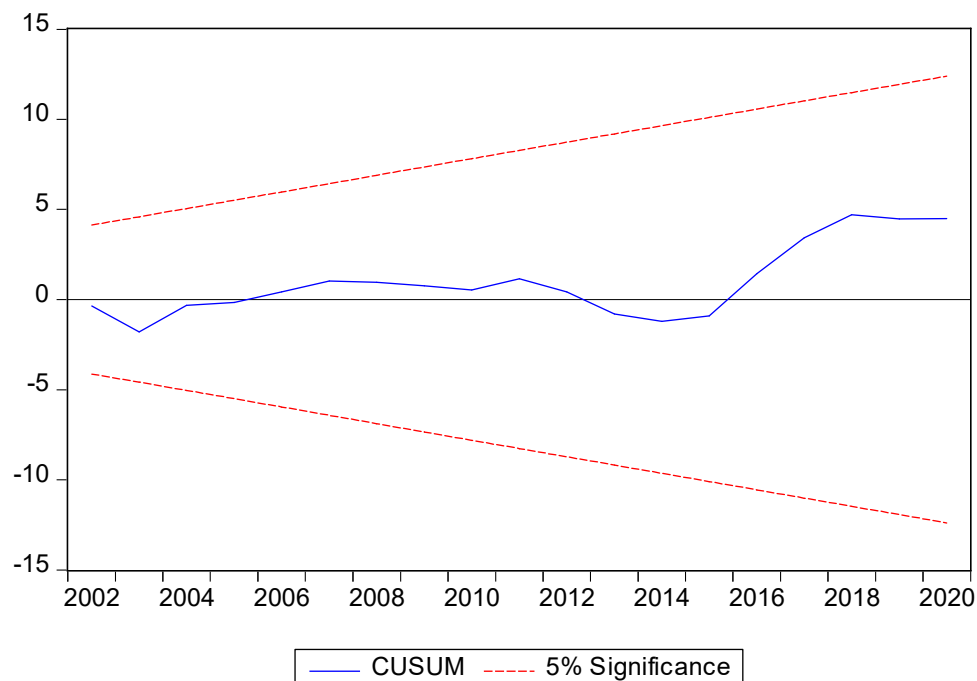
Diagnostic Tests

Table 4.8 ARDL Diagnostic Estimations

Normality Test		
Statistics	Values	Probability
Jarque-Bera	3.935584	0.139765
Serial Correlation LM Test		
Statistics	Values	Probability
Obs*R-squared	0.3538	0.1414
Heteroskedasticity Test		
Statistics	Values	Probability
Obs*R-squared	0.3214	0.2965

Source: Author's Computation, (2022)

Table 4.8 shows the robustness tests carried out to determine the suitability of the ARDL model. These include LM serial correlation, heteroskedasticity, and normality test. From the three diagnostics conducted, the results indicated that no serial correlation problem, no heteroskedasticity problem and the residual of the variables are normally distributed. This is evident from the result of the probability values which is greater than 5% i.e P-value is > 5% in all the tests. Based on this, the model is well specified.



As part of the diagnostic test, this study considered cumulative sum (CUSUM) test which is meant to ascertain the fitness of the model. The decision in the test is that if the plotted CUSUM graph falls within the 5% level of significant, the estimated coefficients would be accepted. From the plotted graph, the CUSUM line lines within the two red lines and this confirmed the stability of the model.

Discussion of Findings and Implication

This study examined impact of macroeconomic variables on foreign direct investments in Nigeria from the periods 1985-2020. The ARDL long-run result indicated that real gross domestic product exhibited significant positive relationship with foreign direct investment. The result implied that the inflow of foreign direct investment is induced by the level of growth and development recorded in their economy. This result negates the works of Faroh and Shen (2015); but supports the work of Ndugbu, Duruechi and Ojiegbe (2017).

The exchange rate also indicates a significant and negative relationship with the inflow of foreign direct investments. The negative impact of the exchange rate shows the unabated fluctuation in Nigerian domestic currency, and this can lead to contagious effects on the inflow of foreign investments. The result also shows that exchange rate fluctuation can intricate the international firms' decisions to invest in the host country. This result supports the work of Asamoah (2012); Faroh and Shen (2015); Bianco and Cong-To (2017)

Also, from the long-run result, the inflation rate depicts a negative relationship with the inflow of investment in Nigeria. The result implies that high rate of inflation in Nigeria hinders the attraction of foreign direct investment. The long-run result supports the works of Asamoah (2012); Ndugbu, Duruechi and Ojiegbe (2017). The interest rate coefficient also shows a significant positive relationship with foreign direct investments. The implication is that rate of interest affects the flow of foreign capital into Nigeria. The finding is also corroborated by Ndugbu, Duruechi and Ojiegbe (2017) but negates the work of Faroh and Shen (2015).

The degree of openness also indicates a significant and positive relationship with the growth of foreign investment. This means that countries that provide favourable economic environment and are experiencing a liberalized financial market will significantly induce the inflow of foreign investment. This finding is supported by Enu, Havi and Attah-Obeng (2013); Maku (2015); Nwosa and Adeleke (2017); Das (2018). Consequently, the coefficient of market capitalization indicates an insignificant negative relationship with foreign investment. The implication of this is that market capitalization does not affect foreign investments and this is corroborated by Maku (2015).

5.0 CONCLUSION AND RECOMMENDATIONS

In line with the empirical evidences that emerged, this study affirmed that major macroeconomic variables that affect the inflow of foreign direct investments are real gross domestic product, exchange rate, interest rate and degree of openness. Based on this, it was recommended that for the inflow of foreign capital to be more harness, these variables should be carefully guided in an economy. Policymakers should put in high esteem economic growth and development which will be corroborated by a consistent exchange rate to increase investors' confidence through a healthy and secured exchange rate management. Interest rate fluctuation should also be

curtailed by the monetary policy. Lastly, a more open economy should be pursued; this will encourage easy trade flow among countries.

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