EFFECT OF EXCHANGE RATES ON FOREIGN DIRECT INVESTMENT IN NIGERIA

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ABSTRACT

In any economy, the need for Foreign Direct Investment (FDI) is due to the underdeveloped nature of a country's economy that essentially hindered the rapid economic growth and development, and exchange rate is one of major factors influencing foreign direct investment inflows into an economy. Therefore, the main objective of this study is to examine the significant effect of exchange rates on foreign direct investment in Nigeria from 1980 to 2021. Data were obtained World Development Indicator (WDI) of World Bank (2023). The study employed ARDL for data analysis. ARDL Bounds Test reveals that there is long-run equilibrium relationship among foreign direct investment, exchange rates, trade openness, population growth rates, and domestic credit to private sectors, and ARDL long-run estimations results indicate that both real effective exchange rates and trade openness have negative significant effects while population growth rates and domestic credit to private sectors have positive insignificant effects on net foreign direct investment inflows in Nigeria. The study recommended the following: the CBN and Bureau De Exchange should ensure an adequate flows of foreign exchange in the foreign exchange market as to have a stable exchange rate which will serve as an attraction of more increased inflow of foreign direct investment; and that the government should widen the degree of trade openness by declaring the borders open with effective trade restrictions.

Keywords: *ARDL, foreign direct investment, Nigeria, trade theory of capital flows, exchange rate*
JEL Classification Code: F31, F21 and F41

1.0   Introduction

In any economy, the need for Foreign Direct Investment (FDI) is due to the underdeveloped nature of a country's economy that essentially hindered the rapid economic growth and development, and exchange rate is one of major factors influencing FDI inflows into an economy (Kenny, 2019). To Caves (1974), FDI brings to the host countries many positive effects to their economies such as technology transfer, managerial skills, know-how, international production networks among others.

According Obida and Abu (2010), FDI not only provides developing countries with the much-needed capital for investment, it also enhances job creation, managerial skills as well as transfer of technology. All of these contribute to economic growth and development. To this end, Nigerian authorities have been trying to attract FDI via various reforms. The reforms include the deregulation of the economy, the new industrial policy of 1989, the establishment of the Nigeria Investment Promotion Commission (NIPC) in early 1990s, and the signing of Bilateral Investment Treaties (BITs) in the late 1990s. Others were the establishment of the

Economic and Financial Crime Commission (EFCC) and the Independent Corrupt Practices Commission (ICPC). However, According to National Bureau of Statistics (NBS 2019), FDI inflows to Nigeria have remained low compared to other developing countries. For instance, FDI in Nigeria just increased by 1150.51 USD Million in the first quarter of 2019. It averaged 1240.22 USD Million from 2007 until 2019, reaching an all-time high of 3084.90 USD Million in the fourth quarter of 2012 and a record low of 314.44 USD Million in the fourth quarter of 2018. More so, Nigeria's FDI inflows fell by 26.7% to USD3.9 billion in 2023 from USD5.3 billion in 2022. The decline was orchestrated by consecutive drop in foreign investment inflows in the first three quarters of 2023 due to political risks and elevated production cost (Nigerian Economic Summit Group, (NESG), 2024).

Similarly, FDI in Nigeria has not been adequate to spur dynamic growth in some areas, and several policy measures have been put in place to remedy the situation (Muritala, 2017). One of the areas of policy adjustment to that effect is in the area of exchange rates. Several exchange rates policies have been adopted in Nigeria over the years; ranging from fixed exchange rates regime and flexible exchange rates regime to a unified exchange rates policy and other policies are Second-tier Foreign Exchange Market (SFEM), Dutch Auction System (DAS), Autonomous Foreign Exchange Market (AFEM). But, FDI remains inadequate for rapid infrastructural and economic development (Adegoriola & Emmanuel, 2022). This is truth because before now Nigeria had been battling with declining and fluctuating foreign investment inflows as cited by NESG (2024) that FDI inflows fell USD3.9 billion in 2023 from USD5.3 billion in 2022. Beside, Nigeria alone cannot provide all the funds needed to invest in various sectors of the economy, to make it one of the twenty largest economies in the world (Obida & Abu, 2010). Due to this problem, the need arises to assess the effects of exchange rates on foreign direct investment in Nigeria. Prior to this present study, there are quite numbers of studies on the area of relationship between exchange rates and foreign direct investment in Nigeria. It is surprisingly, these studies found different results. These studies found positive significant effects (Azeez, Kolapo, & Ajayi, 2012; Benson, Eya, & Yunusa, 2019; Isa, Salako, & Awe, 2019; Murlata, 2017; Saidu, Nnanna, & Ngozi, 2018; Okonkwo, Osakwe, & Nwadibe, 2021) while studies by (Adegoriola & Emmanuel, 2022; Obida & Abu, 2010; Udoh & Egwaikhide, 2008) found negative significant effects.

Since the results of previous studies are mixed up, this present study tends to contribute to the arguments by investigating the significant effects of exchange rates on foreign direct investment in Nigeria from 1980 to 2021 and incorporate population in the model. To achieve objective of the study, the study is structured into five sections; section one is on introduction, section two deals with conceptual reviews, section three concerns with the methodology, section four shows the data analysis and discussion of findings, and section five presents conclusion and policy recommendations.

2.0   Literature Review and Theoretical Framework

2.1   Concept of Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) can simply be described as the cross-border transfer of capital and technological know-how from one nation to another. Also, FDI referred to as an investment made by an individual or company in another a nation with business interest which may be in form of either acquisition of business assets in other countries or establishment of business operation such as ownership or controlling interest in a foreign organization (Kenny, 2019). FDI is therefore a measure of foreign ownership of productive assets such as factories, mines, and land. Increasing foreign investment can be used as one measure of growing economic integration and globalization (Murilata, 2017). FDI is divided into two categories, inward foreign direct investment and outward foreign direct investment.

Both categories will result in a net Foreign Direct Investment (FDI) inflow that can be positive or negative (Adegoriola & Emmanuel, 2022).

2.1.1 Concept of Foreign Exchange Rate

Obaseki (2001) sees exchange rate of a currency as a measure of the worth of a domestic economy in terms of another. The exchange rate measures the external value of a currency. It shows a positive correlation between the domestic and foreign prices of goods and services. According to Oloyede (2002), exchange rate is the price of one country's currency in relation to another which is a key variable for healthy economic management in every nation. Exchange rate is also seen as a measure of the value of the national currency against other which reflects the economic situation of the country compared to other countries (Obadan, 1998).

Jhinghan (2002) viewed foreign exchange rate as the rate at which one currency exchanges for another. It may be referred to as a price of one currency in terms of another currency. Similarly, Takaendesa (2006) said that exchange rate can be either appreciation or depreciation. When the amount of domestic currency required to buy a foreign currency or currencies reduces, it is appreciation, while depreciation is a situation whereby the amount of domestic currency required in buying a foreign currency or currencies increases.

In any country, the systems of exchange rate may be flexible or fixed exchange system (Anoke, Odo, & Ogbonna, 2016). The flexible exchange system is a situation whereby the exchange rate is determined by the interaction of the forces of demand and supply. Fixed exchange rate system, on the other hand, is a system whereby the exchange rate of the domestic currency to other currencies is pegged. The force of demand represents demand for Dollar and the force of supply represents supply of local currency, therefore demand for Dollar for foreign exchange requires a simultaneous a supply of local currency (Anoke *et al.*, 2016).

2.2 Theoretical Framework

This study adopts the trade theory of capital flows. The theory explains that FDI may be higher in countries experiencing uncertainty regarding the exchange rate because such uncertainty acts as a barrier to trade. Multinationals engage in FDI to avoid uncertainty affecting the price of their traded goods as the exchange rate fluctuates. Thus, multinationals increase their FDI to substitute for lower trade volumes in markets associated with higher volatility (Goldberg & Kolstad, 1995). Also, cross-border investment may be a substitute for trade when tariffs or other barriers prevent the free flow of goods (Russ, 2007). If a country's asset is seen as a claim to a future stream of its currency denominated profits, and if profits will be converted back into the domestic currency of the investor at the same exchange rate, the level of exchange rate does not affect the present discounted value of the investment (Blonigen, 1997). This theory fits Nigerian economy these days due to exchange rate fluctuation the country faces.

The trade theory is simply different theories to explain international trade. Trade is the concept of exchanging goods and services between two people or entities. International trade is then the concept of exchange between people or entities in two different countries. People or entities trade because they believe that they benefit from the exchange.

2.3 Empirical Literature Review

Muritala (2017) studies the relationship between foreign exchange rate and foreign direct investment (FDI) in Nigeria from 1990 to 2015 using OLS. Dependent variable is foreign direct

investment while foreign exchange rate and gross domestic products are independent variables. The study found both variables have positive effect but only foreign exchange rate is significant. Saidu, Nnanna, and Ngozi (2018) determine the influence of exchange rate and volatility on foreign direct investment in Nigeria from 1979 to 2014 using ARDL technique. Dependent variable is foreign direct investment whereas independent variables are exchange rate and volatility. The study found that exchange rate has positive significant and volatility has negative significant effects on foreign direct investment. Azeez, Kolapo, and Ajayi (2012) examine the effects of exchange rate volatility on foreign direct investment in Nigeria for a period of 25 years ranging from 1986 to 2010. Dependent variable is foreign direct investment while exchange rate volatility, GDP, Inflation are independent variables. The study employed OLS and Johansen co integration estimation technique. The findings show that there is co-integration among the variables. The result showed that the real exchange rate volatility and GDP contributes positively significantly while inflation negatively significantly to FDI in the long-run. Adokwe, Agu, and Maduka (2019) investigate the effect of exchange rate volatility on foreign direct investment in Nigeria, adopting monthly time series data from 1986 to 2016 using 2Stage Least Squares methods. Dependent variable is foreign direct investment while exchange rate volatility, external reserves, domestic interest rate, RGDP growth rate and trade openness are independent variables. The findings of the study indicated that exchange rate volatility, trade openness and RGDP have negative significant effect but domestic interest rates and external reserve have positive significant effect on Nigeria's foreign direct investment. Okonkwo, Osakwe, and Nwadibe (2021) investigate exchange rate and trade openness on foreign direct investment in Nigeria from 1981-2018. Dependent variable is foreign direct investment while real exchange rates, nominal exchange rates and trade openness are independent variables. The study adopted VECM and Granger causality test. The study found that variables are co-integrated. The result of VECM revealed that both the real exchange rate and trade openness are positively related to foreign direct investment. Trade openness and exchange rate granger cause foreign direct investment. Benson, *et al.* (2019) examines the effect of exchange and interest rates on foreign direct investment in Nigeria 2000-2018 using Johansen Co-integration test. The result shows that there is co-integration. The result of the study indicates that a significant positive relationship exists between exchange rate and foreign direct investment. The long-run co-integrating equation shows that a negative relationship exists between interest rate and foreign direct investment and inflation was negatively significantly related to foreign direct investment in the long-run. Obida and Abu (2010) examine the determinants of foreign direct investments in Nigeria from 1977 to 2006 using error correction technique. Dependent variable is the foreign direct investment while host country's market size (GDP), deregulation, trade openness, infrastructural development, political instability, inflation and exchange rates are the independent variables. The result reveals that exchange rates and infrastructures have negative significant effects but political instability, inflation, trade openness, deregulation, market size(GDP) have positive significant effects on foreign direct investments.

Udoh and Egwaikhide (2008) investigate the impact of exchange rate volatility and inflation uncertainty on foreign direct investment in Nigeria from 1970 to 2005 adopting the Generalized Autoregressive Conditional Heteroskedastic (GARCH) estimation model and OLS. Dependent variable is foreign direct investment and independent variables are exchange rates and inflation. The study found that exchange rate uncertainty has a negative significant impact and inflation has positive significant impact on foreign direct investment inflows in Nigeria. Ahmad and Saad (2021) assess the effects of trade openness and foreign exchange rates on foreign direct investment in Nigeria from 1981 to 2018 adopting Vector Auto Regression (VAR) and the result of Johansen co-integration showed that there is no co-integration among the variables. Analysis of variance decomposition revealed that trade openness has fewer effects on foreign direct investment throughout the periods while the

foreign exchange rate exerts a steady positive but little on foreign direct investment between the 0.24% and 2.25% throughout the periods. Offiong and Atsu (2014) evaluate the influence of trade openness on foreign direct investment in Nigeria for a period ranging from 1980 to 2011employnig OLS. Dependent variable is foreign direct investment while trade openness and lending rates are independent variables. The study found that there is indirect significant relationship between FDI and trade openness. There is no significant relationship between the lending rate and the inflow of FDI to Nigeria in the years under review. Adegoriola and Emmanuel (2022) examine the nexus between exchange rate fluctuation and foreign direct investment in Nigeria from 1986 to 2020 using ARDL technique. Dependent variable is foreign direct investment whereas independent variables are exchange rates, interest rates, gross capital formation and trade openness.

The study found that there is long-run equilibrium relationship among the variables and ARDL long-run estimations show that both exchange rates and interest rates have negative significant effects while trade openness and gross capital formation have positive significant effects on foreign direct investment inflows. Isa, Salako, and Awe (2019) investigate the impact of exchange rate fluctuation on Foreign Private investment (FPI) in Nigeria from 1995 to 2017 using Autoregressive Distributed Lagged Model (ARDL). Dependent variable is foreign private investment while inflation, exchange rate, interest rate and real gross domestic products. The results of study reveal a significant positive relationship between real inward FPI and exchange rate fluctuations. In addition, the results indicate that the rate of inflation have a negative significant impact on real inward FPI. Akintoye (2022) examines the effect of foreign direct investment and foreign portfolio investment on the Nigerian foreign exchange rate from 1991 to 2020 using OLS. The study uses Official CBN rate and Bureau De Change (BDC) rate as proxies for exchange rates. The result shows that foreign direct investment and foreign portfolio investment have the same effect on the Nigerian foreign exchange rates. Olusegun, Oluwatosin, and Ayoola (2009) examine the effects of exchange rates, trade openness, and real gross domestic product on foreign direct investment in Nigeria from 1970 to 2006 adopting the ARDL model and found that there is a long-run relationship among the variables. Dependent variable is foreign direct investment whereas real GDP, exchange rates and trade openness are independent variables. ARDL long-run showed that real GDP have significant positive impact but exchange rates and trade openness have negative significant impact on foreign direct investment. Rasheed and Khan (2019) evaluates the impact of foreign exchange rate on foreign direct investment in Pakistan from 1980 to 2016 and Johansen co-integration approach and vector error correction (VEC) model are applied. FDI is a dependent variable whereas REER, inflation rate, trade openness and real GDP are explanatory variables. The study found that there is co-integration among the variables. VEC equation showed that the inflation rate has negative significant effect while real GDP, REER, and trade openness have positive significant on FDI. Ben (2012) examines the impact of exchange rate fluctuation on foreign direct investment in Kenya from 1981 to 2010 employing OLS. Foreign direct investment is dependent variable and exchange rates fluctuation is independent variable. The study found that exchange rate has positive significant effect on foreign direct investment.

Sharifi-Renani and Mirfatah (2012) evaluate the determinants of inward FDI particularly the volatility of the exchange rate in Iran by using Johansen and Juselius's co-integration system approach model covering the period 1980Q2-2006Q3. The findings of this study reveal that gross domestic product, openness, and exchange rate have a significant positive relationship with foreign direct investment but, world crude oil prices and volatility of exchange rate have a significant negative relationship with foreign direct investment. Ali, Ibrahim, and Omar (2017) examine the impact of exchange rates on foreign direct investment in Somali from 1970 to 2010 applying OLS method. Dependent variable is foreign direct investment while independent variables are exchange rate, inflation, lack of government, and domestic credit

to private sector. The results show that there is a negative and significant relationship found between exchange rate and FDI, while, a positive and significant relationship is observed between inflation and domestic credit to private sector on FDI, and a negative but not significant relationship is observed between lack of government and FDI. Zerrin (2018) studies the relationship between exchange rate volatility and FDI in Turkey for the period 2005Q4-2018Q1 using Toda-Yamamoto causality test. Real effective exchange rate volatility is estimated using the Generalized Autoregressive Conditional Heteroscedasticity model. Toda-Yamamoto causality test revealed that causal relationship runs from FDI to exchange rate volatility. Birgül and Sevcan (2016) study the relationship between exchange rate and FDI inflows in Turkey from 2007 to 2015 using ARDL.

Dependent variable is inflows foreign direct investment whereas exchange rate is the independent variable. ARDL bounds test revealed that there is long-run equilibrium between the variables. The results obtained from a long-term static analysis of estimated ARDL model revealed that there is a significant negative relationship between the exchange rate level and FDI inflows in Turkey. Ogun, Egwaikhide and Ogunleye (2009) conduct a study on real exchange rate and foreign direct investment in Sub-Saharan Africa period 1970-2005 using granger causality and simultaneous estimation techniques. Dependent variable is foreign direct investment and exchange rate. The study found that there is a positive significant relationship between real exchange rate and foreign direct investment. The causality test also showed that there is a statistical dependence between real exchange rate movements and FDI for few of the countries. Khan, Ilyasb, and Chaudhary (2019) examine the relationship between the trade openness, inflation and foreign direct investment (FDI) in selected four South Asian countries over the period of 1981 to 2015. The study adopted a fixed effect or least square dummy variable model. The findings indicate that trade openness and inflation have positive significant impact on foreign direct investment. The population has a negative and significant impact on FDI. Exchange rate volatility and real exchange rate both have insignificant impact on foreign direct investment with positive and negative signs respectively in selected South Asian economies.

2.4   Literature Gap

Reviewing literature on the effects of exchange rates on foreign direct investment, the studies in Nigeria are centered on the same control variables. The control variables include inflation, interest rate, and gross domestic products. However, the studies in other countries have incorporated different macroeconomic variables into their models. For instance, Rasheed and Khan (2019) conducted in Pakistan incorporated trade openness. Ali, Ibrahim, and Omar (2017) conducted in Somali incorporated domestic credit to private sectors.

The importance of these variables cannot be overemphasized in Nigeria; when examining the effect of exchange rates on foreign direct investment. These variables are not often captured in Nigerian content. More so, this present study uses net foreign direct investment inflows instead of foreign direct investment inflows and real effective exchange rates in lieu of either nominal or real exchange rates as used by many authors.

3.0   Methodology

3.1   Data and Source

The study uses annually time series data on the variables of the study to evaluate the significant effects of exchange rates on foreign direct investment in Nigeria from 1980 to 2021. Data were obtained World Development Indicator (WDI) of World Bank (2023)

3.2   Model Specification

Adopting the empirical work of Adegoriola and Emmanuel (2022), the model of this study would be developed by modifying their model by replacing interest rates and gross capital formation with the population growth rates and domestic credit to private sectors.

Adegoriola and Emmanuel (2022)'s model is specified as follows:

$$FDI_t = f(EXR_t, INTR_t, TOP_t, GCF_t)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (1)$$

Where:

FDI= Foreign Direct Investment Inflows
EXR= Exchange Rates
INR= Interest Rates
TOP= Trade Openness
GCF= Gross Capital Formation
t = time trends

Now, by replacing interest rates and gross capital formation with the population growth rates and domestic credit to private sectors, the model suits this study. Therefore, economic model spells out that net foreign direct investment inflows (FDI) is a function of real effective exchange rates, trade openness, population growth rates, and domestic credit to private sectors. The model is specified as follows:

$$FDI_t = f(REER_t, TRO_t, POPgr_t, DCPS_t)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (2)$$

Where:

FDI= Net Foreign Direct Investment Inflows
REER= Real Effective Exchange Rates
TRO= Trade Openness
POPgr = Population growth rates
DCPS= Domestic Credit to Private sector
t = time trends

The econometric model is to be specified as follows:

$$FDI_t = \beta_0 + \beta_1 REER_t + \beta_2 TRO_t + \beta_3 POPgr_t + \beta_4 DCSP_t + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots \quad (3)$$

$\beta_0 > 0$ intercept of the model

$\beta_1, through \beta_4$, are coefficients of independent variables

3.3   Variables and Measurements

In this study, three variables are directly measured from the source of data. Therefore, researchers measured them as follows:

Table 1: Variable and Measurement

Variable	Measurement
FDI	FDI inflows-FDI outflows
Trade openness	Export-import/GDP

Population growth rate	Population$_t$-population$_{t-1}$/ population$_{t-1}$
Domestic credit to private sectors	Total domestic credit to private sectors by banks /GDP

3.4   Method of Data Analysis

ARDL technique is employed for the data analysis in this study. The ARDL model is specified as follows:

$$\Delta[(FDI_t)] = \beta_0 + \beta_1 (FDI_{t-1}) + \beta_2(REER_{t-1}) + \beta_3(TRO_{t-1}) + \beta_4(POPgr_{t-1}) + \beta_5(DCPS_{t-1})$$
$$+ \sum_{i=1}^{p} \alpha_1 \Delta (FDI_{t-1}) + \sum_{i=1}^{m} \alpha_2 \Delta(REER_{t-1}) + \sum_{i=1}^{n} \alpha_3 \Delta(TRO_{t-1})$$
$$+ \sum_{i=1}^{o} \alpha_4 \Delta(POPgr_{t-1}) + \sum_{i=1}^{q} \alpha_5 \Delta(DCPS_{t-1}) + \varepsilon_t \dots\dots\dots\dots\dots (4)$$

Similarly the error correction model is specified as:

$$\Delta[(FDI_t)] = \beta_0 + \sum_{i=1}^{m} \alpha_1 \Delta(FDI_{t-1}) + \sum_{i=1}^{n} \alpha_2 \Delta(REER_{t-1}) + \sum_{i=1}^{o} \alpha_3 \Delta(TRO_{t-1})$$
$$+ \sum_{i=1}^{p} \alpha_4 \Delta(POPgr_{t-1}) + \sum_{i=1}^{q} \alpha_5 \Delta(DCPS_{t-1}) + ecm_{t-1} \dots\dots\dots (5)$$

4.0   Data Analysis, Interpretation and Discussion of Findings

4.1   Descriptive Statistic Analysis

Table 2: Descriptive Statistics Results

Statistics	FDI	REER	POPGR	DCPS	TRO
Mean	1.4150	150.7395	2.6286	9.3351	0.1984
Standard dev.	1.2858	116.4132	0.1390	3.4865	0.2054
Normalized Standard dev.	90.87%	77.23%	5.29%	37.35%	103.49%
Skewness	1.4647	1.8196	1.1372	1.0464	0.7436
Kurtosis	5.8555	5.5734	4.6192	3.8144	2.3479
Jarque-Bera	29.293	34.7664	13.6407	8.8257	4.6149
Probability	0.0000	0.0000	0.0011	0.0121	0.0995
Observations	42	42	42	42	42

Sources: Researchers' computation, E-view 9.

Table 2 presents the results of descriptive statistics. In all, there are forty-two (42) observations. The mean value of net foreign direct investment inflow in Nigeria during this study period was 1.4 with the standard deviation of 1.3. This shows that there is wide variation in the data distribution (net foreign direct investment inflows) from 1980 to 2021. The real effective exchange rate had mean and standard deviation of 150.74 per and 116.41 respectively. Since the mean and its standard deviation closes to each, the data on real effective

exchange are far from their mean. Similarly, the average and standard deviation of population growth rates are stood as 2.6% and 0.14% respectively. This is an indication of the variations in the data distribution (i.e population growth rates) in Nigeria from 1980 to 2021. Moreover, domestic credit to private sectors as percentage of GDP had mean of 9.34% and standard deviation of 3.5%, implying that the data distributions are far from their mean. Lastly, the average and deviation of trade openness were reported to be 0.2 and 0.21. By the virtue of mean is less than its standard deviation, it is obviously that data distributions are not clustered.

As results of variations in each of the variables, normalized standard deviations are equally reported to know which variable is the most the volatile. It can be inferred that trade openness is the most volatile follows by FDI and REER. The least is population growth rate. This is evidence from the percentages.

To show whether the variables are symmetric or not symmetric, Skewness statistics are reported in Table 2. From the results, only trade openness is the symmetric because its value is less than one (0.743) while other variables are asymmetric and the variables are positively skewed and greater than zero implying that they have a long right tail. In addition, Kurtosis statistics are reported to show the tail of distributions. It is only domestic credit to private sectors is mesokurtic because its value is three (3) indicating normal distribution, trade openness demonstrates leptokurtic characteristics because of its values less than three (3) implying that the distribution is flattered to normal distribution whereas FDI, REER and population growth rates are platykurtic characteristics because their values are greater than three (3) testifying that the distributions are peaked relative to normal distribution. Finally, by rule of thumb, the values of Jarque-Bera statistics should less than 5.5 or their p. values should not be significant at 5%. All variables are significant at 5% with exception of trade openness. This result suggests that trade openness is normally distributed while the significance of foreign direct investment, real effective exchange rates, population growth rates and domestic credit to private sectors showing that they are not normally distributed.

4.2   Unit Root Test

Table 3 Unit Root Test Results

Techniques	ADF Technique		PP Technique		Order of integration
Series	Level	1st diff.	Level	1st diff.	
FDI	0.0023*		0.0027		I(0)
REER	0.2985	0.0011*	0.2507	0.0011*	I(1)
POPgr	0.0296**		0.0217		I(0)
DCPS	0.1707	0.0000*	0.2896	0.0000*	I(1)
TRO	0.7529	0.0000*	0.8772	0.0000*	I(1)

*,** imply 1%, 5% significance levels

Researchers' computation, E-view 9.

It can be seen from the Table 3 that net foreign direct investment inflows (FDI) and population growth rates are significant at 1% and 5% respectively at level through both techniques (ADF and PP). This means that the two series are stationary at level. The other series are not significant at level through the both techniques, implying that the series are not stationary. Therefore, they need to be differenced. However, at the 1st difference, the series are significant

at 1% through both techniques, implying that they are stationary at 1st difference. Finally, both FDI and population growth rates are stationary at level, I(0) while real effective exchange rates, domestic credit to private sectors and trade openness are stationary at 1st difference. So, the order of integration is mixture of I(0) and I(1). This necessitates the adoption of ARDL technique.

4.3   Co-integration Test

Table 4 ARDL Bounds Test Results

F-statistic	4.4363	Sig. Levels	Lower Bound	Upper Bound	Remark
		10%	2.2	3.09	Co-integration
		5%	2.56	3.49	Co-integration
		1%	3.29	4.37	Co-integration

Researchers' computation, E-view 9.

From the Table 4, it can be seen that the value of F-statistic (4.4363) is greater than the critical values of both I(0) and I(1) bounds at 1% which are 3.29 and 4.37 respectively, this signifies that there is long-run equilibrium relationship, otherwise called co-integration among the variables (net foreign direct investment inflows and its determinants).

4.4   Short-run ARDL Estimations

Table 5 ARDL Short-run Estimations Results

Dependent variable: net FDI inflows		
Variables	Coefficient	Std. Error
D(REER)	-0.001970	0.002435
D(POPGR)	3.607440	(1.879049)*
D(DCPB)	0.092800	0.074821
D(TRO)	-1.385534	1.824947
ECM	-0.855061	0.143963

* implies 1% significance level

Researchers' computation, E-view 9.

From Table 5, it can be seen that in the short-run, only lag population growth rate has positive significant effect on net foreign direct investment in Nigeria while lag real effective exchange rate, lag domestic credit to private sectors and lag trade openness have insignificant effect on net foreign direct investment in Nigeria. This means that only population growth rate was influenced and attracted net foreign direct investment in Nigeria. This finding is against the finding of Khan *et al* (2019) who find significant negative relationship between the two variables. The speed of adjustment, other wise called Error Correction Mechanism (ECM), is satisfied the three conditions: less than one, negative and significant. The ECM is -0.85506 and significant at 1% level of significance. Therefore, the speed of adjustment is 86% per annum. In case, there is disequilibrium between the net foreign direct investment inflows and its determinants in the short-run, they will restore to long-run equilibrium by 86% per annum.

4.5   Long-run ARDL Estimations

Table 6 ARDL long-run Estimations Results

Dependent variable: net FDI inflows		
Variables	Coefficient	Std. Error
REER	-0.006777	(0.001961)*
POPGR	1.364298	1.679457
DCPB	0.070969	0.080963

TRO	-3.124735	(1.419078)**
C	-1.091078	4.368603

*,** imply 1%, 5% significance levels

Researchers' computation, E-view 9.

The results of ARDL long-run estimations are presented in Table 6. From the table, it is inferred that real effective exchange rates and trade openness have inverse effects on net foreign direct investment inflows in Nigeria from 1980 to 2021. These two variables are at 1% and 5% level of significances respectively. In contrast, population growth rates and domestic credit to private sectors have direct effect on net foreign direct investment inflows in Nigeria during this study, from 1980 to 2021. But the variables are statistically insignificant.

The co-efficient of real effective exchange rates is -0.006777 and significant at 1%. This implies that in Nigeria, a rise in real effective exchange rates or depreciation in naira will cause 6.8% decrease in net foreign direct investment inflows in the long-run. This may be due hyper-inflation in the country. By a prior expectation, depreciation is expected to have direct effect on foreign direct investment. When domestic currency is devalued or depreciated, multinational corporations bring capital investment to such economy. But this finding is contrary to a prior expectation. This result is similar and supporting these studies (Ali *et al.*, 2017; Birgül & Sevcan, 2016) who claim that there is inverse significant effect of exchange rates on foreign direct investment. But this result is in contrast with the findings of these studies (Azeez *et al.*, 2012; Benson *et al.*, 2019; Murtala, 2017; Saidu *et al.*, 2018; Okonkwo *et al.*, 2021; Udoh & Egwaikhide, 2008) who suggest that exchange rates have direct significant effect on foreign direct investment. The divergence in the result of this study and those reviewed studies is that the difference in proxies. This study uses real effective exchange rates as the proxy for exchange rates and net foreign direct investment inflows as the proxy for foreign direct investment while those in literature used either real or nominal exchange rates and foreign direct investment.

Similarly, the co-efficient of trade openness is -3.124735 and significant at 5%. This indicates that in long-run in Nigeria, one percent in free trade or one percent increase in trade openness will cause 3125% reduction in net foreign direct investment inflows. By a prior expectation, free trade discourages foreign direct investment. So, trade openness is expected to have inverse effect on foreign direct investment. When a country opens her economy to rest of world will enjoy free inflows of goods and services from advanced economies, but multinational corporations will be disturbed. This finding is support a prior expectation. The result confirms to these studies (Offiong & Atsu, 2014 and Olusegun *et al.*, 2009) who argue that trade open with effective commercial policy would enhance net foreign direct investment inflows. But the result deviates from the following studies (Abiola, 2019; Ahmad & Saad, 2021; and Rasheed & Khan, 2019) that support that free trade has positive significant impact on net foreign direct investment inflows.

Both population growth rates and domestic credit to private sectors have effect on net foreign direct investment inflows and also are in-line with a prior expectation; they are statistically insignificant. As the population grows, it increases market for multinational corporations and investments. As reasonable interest rate, there will be direct correlation between the domestic credit to private sectors and foreign direct investment inflows.

Table 7 Post-Estimation Tests Results

Post- estimation Tests	F-statistic	P. value	Remark
Serial Correlation	1.385502	0.2648	No serial correlation
Heteroskedasticity	3.724785	0.0645	No heteroskedasticity

Normality	21.8458	0.0000	Not Normally distributed
Misspecification of model	3.894983	0.0611	No misspecification of model
Multicollinearity	Mean VIF	1.535	No multicollinearity
Stability	CUSUM stable within 0.05		No instability of model

Researchers' computation, E-view 9.

From the table above, the regression model of this study is free from problem of serial correlation. This implies that residual in one period is not related to residual in another period. The null hypothesis of no failed to reject at 5%. Also, the study is free from the problem of heteroskedasticity. This is because the p. value is not significant at 5%. This means that variances of residuals are constant, that is homoskedasticity. The Ramsey RESET Test reveals that there is no misspecification of model in this study as the p. value is not significant at 5% level of significance, this indicates that model of this study is well specified. To test for multicollinearity among the independent variables, the average variance inflation of factor is just 1.5 which is not up 10 shows there is no multicollinearity among the independent variables. The model is stable within 5% level of significance. However, the regression model is not free from problem of normality of residuals as the p. value is significant. Residuals are not normally distributed.

5.0   Conclusion and Recommendations

The study found that real effective exchange rates and trade openness have negative significant effect on net foreign direct investment inflows in Nigeria. Therefore, real effective exchange rate and trade openness are good mechanisms for influencing the level of net foreign direct investment in Nigeria. Appreciation or revaluation of naira will cause more net foreign direct investment inflows while the depreciation or devaluation of naira will restrict or decline the level net foreign direct investment inflows in Nigeria. Trade openness with trade restriction and commercial policy stimulates more foreign direct investment in the country. The study recommended the following: the CBN and Bureau De Exchange should ensure an adequate flow of foreign exchange in the foreign exchange market as to have a stable exchange rate which will serve as an attraction of more increased inflow of foreign direct investment; and that the government should widen the degree of trade openness by declaring the borders open with effective trade restrictions.

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