International Journal of Applied Business and Management Sciences
Vol. 5, No. 2, 2024, pp. 127-138, ISSN: 2582-6581
https://DOI:10.47509/IJABMS.2024.v05i02.02

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IMPACT OF EXCHANGE RATE ON FOREIGN DIRECT INVESTMENT IN NIGERIA

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Article History
Received : 07 July 2024; Revised : 19 August 2024; Accepted : 28 August 2024; Published : 30 November 2024

Abstract: This study examines the effects of the exchange rate on foreign direct investment in Nigeria from 1986 to 2023. Using time series data sourced from the World Bank (2023) reports on foreign direct investment, exchange rate, inflation rate, financial development, population growth rate, and opening trade (export and imports). The stationarity tests report mixed results and the study adopted the Autoregressive distributive lag technique (ARDL) for data analysis as well as Toda-Yamamoto's (1995) causality techniques to determine the direction of causality between the variables. The result shows that the exchange rate has a positive and significant effect on foreign direct investment. Also, the inflation rate has a positive and significant impact on foreign direct investment. Financial development has a positive and significant effect on foreign direct investment whereas population growth rate has a negative and significant effect on foreign direct investment both in the short and long runs respectively. In addition, the government should implement policies that would ensure exchange rates are judiciously allocated to productive and key sectors of the economy to promote investment and sustainable growth and development of the economy.

Keywords: Foreign direct investment, exchange rate, inflation rate, financial development, population growth rate, and opening trade (export and imports).

1. INTRODUCTION

The price at which one currency usually the domestic currency can be exchanged for another currency, is known as exchange rate. Since the implementation

To cite this paper:
Zubai A. Zulaihatu and Felix Emmanuel Dodo (2024). Impact of Exchange Rate on Foreign Direct Investment in Nigeria. *International Journal of Applied Business and Management Sciences*. 5(2), 127-138.

of a floating exchange-rate regime in 1973, the effects of the exchange rate on foreign direct investment have been the subjects of both theoretical and empirical investigations globally (Malerba, 2020). Conversely, foreign direct investment is an investment made directly by a corporation based in another country to increase productivity in the host country. In this sense, almost every African nation looks for foreign direct investments due to the fact that they help them grow economically and integrate into the global economy. Foreign direct investment is significant in Nigeria because it has the potential to transfer technology and knowledge, generate employment, increase overall productivity, foster entrepreneurship and competitiveness, and eventually end poverty through long-term economic growth and development (Felix & Moukhtar, 2021).

In light of this, Nigeria has implemented a number of exchange rate strategies over the years, ranging from fixed exchange rates to floating exchange rate regimes, among others, to attrack foreign direct investment. In spite of these governmental initiatives, foreign direct investment is still insufficient for quick economic and infrastructure growth (Okonkwo *et al.*, 2021). Therefore, exchange rate volatility in nigeria is a major factor which deters investment inflows and makes international investors wary (Adewale *et al.*, 2023).

Against this background, the major objective of this study is to examine how the exchange rate affects foreign direct investment in Nigeria between 1986 to 2023. The remainder of this paper is structured as follows: Section 2 covers the literature review and theoretical framework on the exchange rate and foreign direct investment in Nigeria. Section 3 focuses on the source of data and methodology. Section 4 presents the results and discussion and section 5 covers the conclusion and recommendations.

2. EMPIRICAL LITERATURE REVIEW

Benson *et al.* (2019) looked at how interest rates and exchange rates affected foreign direct investment between 2006 and 2018. The Augmented Dickey-Fuller Test was used to examine the data's unit root property. Additionally, the study used statistics from the Johansen Co-integration test, and the findings show that foreign direct investment and exchange rates are positively correlated.

Another study by Timothy (2019) investigated the relationship between foreign capital inflows into Nigeria and exchange rate volatility. Data for the study was taken from the CBN Statistical Bulletin between 1990 and 2016. Thus, the results of this study demonstrate that foreign direct investment in Nigeria is significantly and negatively impacted by the exchange rate.

Likewise, Adokwe *et al*. (2019) investigated how foreign direct investment in Nigeria was impacted by exchange rate fluctuation. From 1986 to 2016, monthly time series data were used in the study. The generalized autoregressive conditional heteroscedasticity (GARCH) approach was also used in the study. The findings showed that foreign direct investment in Nigeria is significantly impacted negatively by exchange rate fluctuation.

Additionally, Okonkwo *et al*. (2021) examined how the exchange rate affected foreign direct investment in Nigeria between 1981 and 2018. The study used a variety of diagnostic testsand and the Error Correction Model (ECM). The findings showed that foreign direct investment is positively impacted by both the real and nominal exchange rates.

Adewale *et al*. (2023) examined the connection between exchange rates and foreign direct investment (FDI) from 1981 until 2021 in Nigeria. Using a Fully Modified Ordinary Least Squares (FMOLS) regression analysis, the study finds that foreign direct investment (FDI) and exchange rates in Nigeria are significantly positively correlated.

The results from several studies on the impact of exchange rates on foreign direct investment could be divided into positive and negative. The empirical issue remains open for further investigation. For instance, studies by Benson, *et al*. (2019) and Adewale *et al*. (2023) found that exchange rate has positive and significant effects on foreign direct investment. Also, Timothy (2019), Adokwe, *et al*. (2019), and Okonkwo, *et al*. (2021) found that exchange rate has negative and significant effects on foreign direct investment. Indeed, the methodology used and the period of study considered could be responsible for the mix and diversity of results. Furthermore, empirical research has revealed that, following the onset of the COVID-19-induced economic slump that caused macroeconomic disequilibrium in the country, Nigeria has only a small number of thorough studies on the effect of exchange rates on foreign direct investment.

In general, the previous studies have been criticized for using similar variables such as investment, exchange rate fluctuation, inflation rate, interest rate, and GDP growth rate. The current study, however, aims to close that gap. As a result, this study is different from other research since it included indicators that are thought to affect foreign direct investment in Nigeria, such as population growth rate, financial development, and trade opening (both import and export).Therefore, this study becomes imperative and unique because it covers the period of COVID–19 lockdown and subsequent economic recession that took place in Nigeria. In addition, this study used

ARDL methodology that allows long-term and short-term estimations of the impact of the exchange rate on foreign direct investment in Nigeria, using annual data spanning from 1986-2023.

2.3. Theoretical Framework

2.3.1. Neoclassical Theory

This theory stated that the highest expected rate of return on investment has an impact on foreign capital flows. Incentives such as the projected rate of return on investment, macroeconomic stability, particularly with regard to inflation and exchange rates, investment norms, investment security, and tax regime all have a direct impact on future capital flows. This is due to the fact that the volatility of the macroeconomic variable makes private investors apprehensive about the cost of their investment and the profitability thus far. Therefore, improving the issues that pose risks to foreign capital inflows will help to improve the environment for foreign investment (Cockcroft & Riddell, 1991). Furthermore, the trade hypothesis contends that because exchange rate uncertainty hinders trade, foreign direct investment may be higher in nations that face such uncertainty. Foreign direct investment is a strategy used by multinational corporations to mitigate the impact of exchange rate fluctuations on the price of their traded goods. Therefore, in markets with more volatility, multinational corporations boost their foreign direct investment to offset weaker trade volumes (Goldberg & Kolstad, 1995).

3. METHODOLOGY

3.1. Source of Data

This study employed time series data from 1986 to 2023. The annual data was drawn from the World development indicator (2023) reports on selected variables such as foreign direct investment, exchange rate, inflation rate, and financial development, population growth rate, the opening of trade (export and import) in Nigeria.

3.2. Model Specification

The econometric model is specified as follows:

$$FDI_t = \beta_0 + \beta_1 EXR_t + \beta_2 IFR_t + \beta_3 FD_t + \beta_4 PGR_t + \beta_5 OT + \mu_t \quad (1)$$

Where:

FDI= Foreign Direct Investment

EXR= Exchange Rate

IFR= Inflation Rate

FD= Financial Development is Proxy by Domestic Credit to the Private Sector by Deposit Money Banks

PGR=Population Growth Rate

OP= Opening of Trade (Export and Import)

μ =Error Term, t = Time Series, βo = Constant

β_1, β_2, β_3, β_4, and β_5 are parameters of the variables to be estimated in the model

3.3. Estimation Procedure

To examine the impact of the exchange rate on foreign direct investment in Nigeria, the study employed two types of unit root tests such as the Augmented Dickey-Fuller (1982) and the Phillips-Perron (1988). The choice of the unit root tests is to take quality control of the heterogeneity problem and to avoid spurious regression results.

3.3.1. Estimation

To ascertain the impact of exchange rates on foreign direct investment in Nigeria, this study used the Autoregressive Distributed Lag (ARDL) technique, which was created by Pesaran and Shin (1999) and expanded by Pesaran, Shin, and Smith (2001). Because the ADF and PP unit root test reveals a combination of I (0) and I (1) levels of integration, the ARDL approach was chosen. Due to its single-equation structure and ease of interpretation, this method is better than other kinds of cointegration techniques. Different lag durations can be assigned to the model's variables. The ARDL model's dynamic short- and long-term parameters are as follows:

$$\Delta[(\ln LFDI_t)] = \beta_0 + \beta_1 \ln(LFDI_{t-1}) + \beta_2 \ln(LEXR_{t-1}) + \beta_3 (LIFR_{t-1}) + \beta_4 (LPGR_{t-1})$$
$$+\beta_5 (LOT_{t-1}) + \sum_{i=1}^{p} \alpha_1 \Delta \ln(LFDI_{t-1}) + \sum_{i=1}^{m} \alpha_2 \Delta \ln(LEXR_{t-1})$$
$$+\sum_{i=1}^{n} \alpha_3 \Delta LIFR_{t-1} + \sum_{i=1}^{r} \alpha_4 \Delta LPGR_{t-1} + \sum_{i=1}^{0} \alpha_5 \Delta LOT_{t-1} + \varepsilon_t \quad (2)$$

In addition, the error correction model is specified as:

$$\Delta[(\ln LFDI_t)] = \beta_0 + \sum_{i=1}^{p} \alpha_1 \Delta \ln(LFDI_{t-1}) + \sum_{i=1}^{m} \alpha_2 \Delta \ln(LEXR_{t-1}) + \sum_{i=1}^{n} \alpha_3 \Delta LIFR_{t-1} + \sum_{i=1}^{r} \alpha_4 \Delta LPGR_{t-1} + \sum_{i=1}^{0} \alpha_5 \Delta LOT_{t-1} + ecm_{t-1} \quad (3)$$

Where Δ is the first difference operator, ln(LFDI) is the natural log of foreign direct investment, ln(LEXR) is the natural log of the exchange rate, ln(LIFR) is the natural log of the inflation rate, ln(LPGR) is the natural log of population growth rate, ln(LOT) is the natural log of opening trade, the p denote the lag Length, the α_0, α_1, α_2, α_3, α_4 and α_5, β_0, β_1, β_2, β_3, β_4 and β_5 are parameters to be estimated in the model while the et stand for white-noise error term respectively.

4. RESULTS AND DISCUSSION

4.1. Stationarity Tests

At this step of the study, the data series were converted to natural logarithm form, and the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were used to look for unit roots on the variables at both level and first difference. Table 1 displays the outcomes of the unit root testing.

Table 1: Results of Unit Root Tests

Unit root tests				
Augmented Dickey-Fuller (ADF)			*Phillips Perron (PP)*	
Level				
Variables	*Constant Without Trend*	*Constant With Trend*	*Constant Without Trend*	*Constant With Trend*
LFDI	-2.3547	-2.1538	-2.6433	-2.1395
LEXR	-2.5163	-2.6744	-2.7818	-2.6750
LIFR	- 3.8450**	-3.6329**	-3.3119**	-3.6425**
LFD	- 1.7732	-1.4793	-1.2925	-2.7029
LPOGR	-3.7730***	-3.0763***	3.8610***	3.6708***
LOT	-0.5636	-1.3363	-0.5948	-1.3363
First Difference				
LFDI	-8.6664*	-8.5944*	-10.2974*	-12.5706
LEXR	-6.0277*	-6.1478*	-6.0269*	-6.1879*
LIFR	-2.2153	-2.6682	-2.8393	-2.6407
LFD	-5.5589*	-5.5273*	-9.6451*	-8.7705*
LPOGR	- 1.3786	-1.3525	-1.3786	-1.3829
LOT	-4.3621**	-4.2860**	-4.3621**	-4.2860**

Note: *, ** and *** denote significance at 1%, 5%, and 10% significance level, respectively.
Source: Authors' computation from E-views 9 software using data from World Bank, 2023.

In Table 1, the stationarity tests proved to have mixed results, in which some variables like inflation rate and population growth rate were stationary at the level I(0) and other variables like foreign direct investment, exchange rate, financial development, and opening of trade were also stationary at their first difference I(1). This indicates that none of the series is I (2) and can all be included in the ARDL estimation. Since the results were mixed, this study applied the ARDL model (Pesaran *et al.*, 2001), which provided a co-integration test, as well as short-run and long-run coefficients. Other tests include the Normality test, Serial correlation, Heteroscedasticity test, and Ramsey reset test which in turn confirmed the adequacy and feasibility of the model used.

4.2. Bounds Test

Table 2: Results of the ARDL Bounds Test

Test Statistic	Value	K
F-statistic	6.367425	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.08	3
5%	2.39	3.38
1%	3.06	4.15

Source: Authors' computation from E-views 9 software using data from World Bank, 2023.

The results of the ARDL bounds test in Table 2, report that the null hypothesis of no co-integration between exchange rate and foreign direct investment in Nigeria can be rejected as can be seen from the F-statistic value 6.3674 provided is above the upper and lower critical bound values. The result reported in Table 2 indicates the presence of cointegration in the model. As supported by the results of the ARDL bound tests there is evidence that the first objective of the study which is to examine the relationship between exchange rate the foreign direct investment has been achieved. This is because the exchange rate has a long run relationship with foreign direct investment, over the study period.

4.3. Estimation

In Table 3 the results of the short-run coefficients show that the exchange rate has a positive and significant effect on foreign direct investment at a 5% level of significance. It indicates that an increase in exchange rate by 1% would increase foreign direct investment by roughly 0.99%. Also, the inflation rate has a positive and significant impact on foreign direct investment at a 1% level

Table 3: Results of ARDL short run Coefficient-Dependent Variable is LFDI

Cointegrating Form				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
D(LEXR)	0.9948**	0.3147	3.1609	0.0195
D(LIFR)	0.4837*	0.0694	6.9679	0.0004
D(LFD)	0.9733*	0.2275	4.2787	0.0052
D(LPOGR)	-3.9391**	15.5430	-2.5696	0.0424
D(LOT)	-0.0896	0.0594	-1.5101	0.1818
CointEq(-1)	-0.5074**	0.1199	-12.5679	0.0000

Source: Authors' computation from E-views 9 software using data from World Bank , 2023.
Note: * and ** denote significance at 1% and 5% significance level, respectively.

of significance. This implies that an increase in the inflation rate by 1% would increase foreign direct investment by roughly 0.48%. Financial development has a positive and significant effect on foreign direct investment at a 1% level of significance. It implies that an increase in financial development by 1% would increase foreign direct investment by roughly 0.97%. While the population growth rate has a negative and significant effect on foreign direct investment at a 5% level of significance. This shows that an increase in population growth rate by 1% would decrease foreign direct investment by roughly 3.9%. Again, the error correction term for the model of ECM (-1), gives the validation regarding if the model is feasible in the short run or not. The result report ECM (-1), has a coefficient value (-0.5074) with a negative sign, less than one, and is statistically significant at a 1% level of significance. Therefore, the speed of adjustment for correcting disequilibrium from the previous year to equilibrium in the current year is 0.50% respectively.

Table 4: Results of Long Run Coefficients- Dependent Variable is LFDI

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
LEXR	0.0783**	0.1142	0.6857	0.0185
LIFR	1.0648*	0.2474	4.3041	0.0051
LFD	0.7214**	0.2303	3.1327	0.0203
LPOGR	-8.7480***	4.0905	-2.1386	0.0763
LOT	0.2425	0.1305	1.8582	0.1125
C	-1.3632	2.7686	-0.4924	0.6400

Note: *, ** and *** denote significance at 1%, 5%, and 10% significance level, respectively.
Source: Authors' computation from E-views 9 software using data from World Bank, 2023.

Similarly, in Table 4 the results of the long-run coefficients show that the exchange rate has a positive and significant effect on foreign direct investment

at a 5% level of significance. It indicates that an increase in exchange rate by 1% would increase foreign direct investment by roughly 0.08%. Also, the inflation rate has a positive and significant impact on foreign direct investment at a 1% level of significance. This implies that an increase in the inflation rate by 1% would increase foreign direct investment by roughly 1.06%. Financial development has a positive and significant effect on foreign direct investment at a 5% level of significance. It implies that an increase in financial development by 1% would increase foreign direct investment by roughly 0.72%. While the population growth rate has a negative and significant impact on foreign direct investment at a 10% level of significance. This shows that an increase in population growth rate by 1% would decrease foreign direct investment by roughly 8.7%. Also, the results show that the second objective of this study which is to investigate the impact of the exchange rate on foreign direct investment in Nigeria has been achieved. This is because the exchange rate has a positive and significant impact on foreign direct investment.

4.4. Diagnostic tests

In this study, the results of different residual diagnostic tests are conducted to determine the adequacy of the estimates such as the normality (Jaque-Bera (JB)) test for normal distribution of error or the residuals, Serial Correlation, Heteroscedasticity test, and Ramsey RESET Test as presented as follows.

Table 5: Result of ARDL Diagnostic tests

Tests	*F-statistics*	*Prob. Value*
Normality((Jarque -Bera Test Statistics)	1.2655	0.5311
Serial Correlation(Breusch-Godfrey LM Test)	22.0951	0.1601
Heteroscedasticity Test: Breusch-Pagan-Godfrey	1.7810	0.2463
Specification Error (Ramsey RESET Test)	1.6425	0.2562

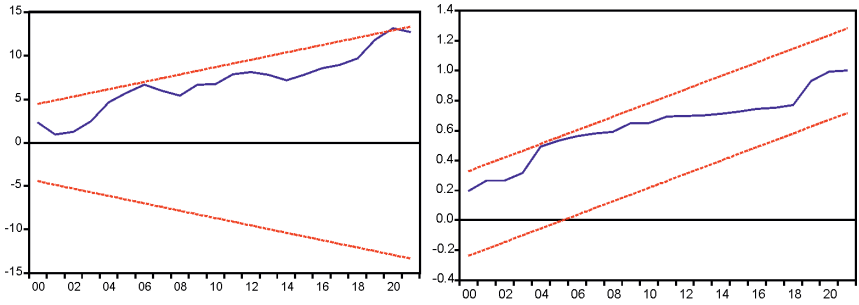
Source: Authors' computation from E-views 9 software using data from World Bank, 2023.

The results of different diagnostic tests show that the conditions for normality are all met because the Jarque-Bera (1987) probability value 0.5311 is not significant at any significances level. Therefore, the data is normally distributed. Also, the Breusch-Godfrey (1978) serial correlation LM test result indicates the p-value statistics of 0.1601 is not significant at any level. This implies that there is no serial correlation problem. Besides, the result of tests for Breusch-Pagan (1979) Heteroskedasticity conducted revealed that the p-value 0.2463 is not statistically significant at any level which implies the absence of a Heteroskedasticity problem. The test confirms that there is no problem with

conditional Heteroscedasticity. The Ramsey (1969) RESET test expresses that the estimated models are well specified and are considered meaningful because the p-values 0.2562 is not significant at any significances level. Consequently, based on the estimated results report in Table 5, the conclusion is that the model is reliable for decision-making and forecasting.

4.5. Stability Test

The study further employed the Cumulative Sum of recursive residuals (CUSUM) developed by Brown, Dublin, and Evans (1975) in testing the stability of the parameters of the model within a 5% level of significance. It is observable from the CUSUM and CUSUMQ tests in Figures 1 and 2, that there are no structural breaks because the tests are within a 5% level of significance. In addition, there are no chances of having spurious regression because the blue lines are in-between the two red lines which confirm that the model is stable and feasible, throughout the study.



Source: Authors' computation from E-views 9 software using data from World Bank, 2021.

4.5. Causality Test Results

The causality test results are presented in Table 6 and are based on the Toda and Yamamoto (1995) approach. The results are presented as follows;

Table 6: Results of TY Causality Test

Causality	*Chi-sq*	*df*	*Prob.*
LEXR does not Granger cause LFDI	2.2958	2	0.3173
LFDI does not Granger cause LEXR	0.3178	2	0.8531
LFDI does not Granger cause LIFR	0.3436	2	0.8421
LFDI does not Granger cause LFD	6.2291	2	0.0444**
LFDI does not Granger cause LPOGR	0.0846	2	0.9586
LFDI does not Granger cause L0T	0.2817	2	0.8686

Note: that ** represents 5% level of significance.
Source: Authors' computation from E-views 9 software using data from World Bank, 2023.

The results of the TY causality tests presented in Table 6 indicate that there is no causality from exchange rate to foreign direct investment and from foreign direct investment to exchange rate. Thus, as shown by the non-significance of the ρ-values. Therefore, the null hypothesis of no causality between the variables is failed to be rejected. Furthermore, the causality results revealed a unidirectional causality between foreign direct investment and financial development. This implies the third objective of the study which is to determine the direction of causality of exchange rate on foreign direct investment in Nigeria has not been achieved. This is because no causality exists between the exchange rate and foreign direct investment during the study period.

5. CONCLUSIONS AND RECOMMENDATIONS

This paper empirically investigates the effect of the exchange rate on foreign direct investment in Nigeria, using time series data over the period 1986-2023. The estimation techniques applied are the Autoregressive Distributed Lag (ARDL) model and Toda-Yamamoto (1995) causality techniques to determine the direction of causality between the variables. From the empirical results, the study concludes that the exchange rate directly affects foreign direct investment in Nigeria. This could mean that foreign investors are attracted to Nigeria due to the currency depreciation in the economy. Hence, the need for an economic solution is imperative. This study calls for the need to adopt policies to stabilize the exchange rate as well as attracts more foreign direct investment into the country. In addition, the study recommends that government should henceforth ensure that exchange rate is channeled to the productive sectors of the economy to promote economic growth and attract foreign investors into the Nigerian economy.

References

Adejoke, M. A., Bosede, C. O., & Eyitayo, O. O. (2023). Effect of exchange rate on foreign direct investment in Nigeria, *ABUAD Journal of Social and Management Sciences (AJSMS), 5*(2), 302-318.

Adokwe, E. I., Agu, A.O, & Maduka, A. **C.** (2019). Exchange rate volatility and foreign direct investment: The Nigerian experience, *Journal of Business & Economic Policy, 6*(4), 78-87.

Benson, E., Eya, C. I., & Yunusa, A. (2019). Effect of Exchange and Interest Rates on Foreign Direct Investment in Nigeria 2006-2018, *International Journal of Contemporary Research and Review, 10*(7). 21572-21587

Breusch, T.S. & Godfrey, L.G. (1978). Testing for autocorrelation in dynamic linear models. *Australian Economic Papers, 17,* 334–355.

Breusch, T. S. & Pagan, A. R. (1979). A simple test for heteroskedasticity and random coefficient variation. *Econometrica*. *47***.**

Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society*. *2,* 149-192.

Cockcroft, L. & Riddell, R. (1991). Foreign direct investment in sub-saharan Africa. *Working paper WPS 619*, Washington, DC: The World Bank.

Dickey, D.A., & Fuller, W.A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root, *Econometrica, 47,* 263–291.

Felix, E. D., & Moukhtar M. I. (2021). Impact of foreign direct investment on unemployment in Nigeria. *Dutse International Journal of Social and Economic Research (DIJSER), 7*(1), 91-101.

Goldberg, L. S., & Kolstad, C. D. (1995). Foreign direct investment, exchange rate variability and demand uncertainty. *International Economic Review*, *36*(4), 855–873.

Jarque, C. M., & Bera, A. K. (1987). A test for normality of observations and regression residuals, *International Statistical Review*, *55*(2), 163-172.

Javed, Z. & Farooq, M. (2009). Economic growth and exchange rate volatility in case of Pakistan. *Pakistan Journal of life and Social Sciences, 2,* 112-118.

Malerba, M. (2020). Macroeconomic and foreign exchange policies of major trading partners of the united state, Report to congress.

Okonkwo, J. J., Osakwe, C. I., & Nwadibe, E. C. (2021). Exchange rate and foreign direct investment in Nigeria 1981-2018. *International Journal of Academic Research in Business and Social Sciences*, *11*(1), 213–232.

Pesaran, M.H., Sin, Y., & Smith, R.J. (2001). Bounds testing approaches to the analysis of the level relationship. *Journal of Applied Econometrics*, 6, 289-326.

Philips, P.C.B., & Perron, P. (1998).Testing for a unit root in time series regression, *biometrical. 32,* 301-308.

Ramsey, J. B. (1969). Test of specification error in classical linear least-squares regression analysis. *Journal of the Royal Statistical Society Series B*, *31,* 350-371.

Timothy, A. A. (2019). Exchange rate volatility and foreign capital inflows in Nigeria, *Management Studies and Economic Systems (MSES), 4* (2), 161-170.

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics*, *66,* 225–250.

World Development Indicator (2021). Word bank indicator /data.worldbank.org/ indicator