

# Impacts of Foreign Direct Investments on Nigeria's Economic Growth 2017-2021

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**Abstract:** Most African countries struggle to attract foreign direct investment (FDI) and Nigeria particularly is part of this countries. This research empirically examined the Impact of foreign direct investment on macroeconomic variables (exchange rate, and inflation rate) in Nigeria and the period analysis covered 5 years (2017-2021). The study employed is the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model. The econometric analysis started with pre-diagnostic and this is a first condition for estimating GARCH. Augmented Dickey-Fuller (ADF) unit root test was used to study and test properties of the time series variables. The result at this revealed that the variables: foreign direct investment, exchange rate and inflation rate were first difference  $I(1)$  or stationary at either level  $I(0)$ . The GARCH model discovered that foreign direct investment (FDI) has positive Impact on exchange rate while the inflation rate has negative Impact. Based on this, the study recommended the delivery of suitable policy framework that will be conducive for doing business in Nigeria, to attract the inflow of FDI necessary to stimulate growth Macroeconomic variables.

**Keywords:** Foreign Direct Investment, Macroeconomic, Exchange rate

## Introduction

In the previous one decade (2010-2022), the link between macroeconomic and foreign direct investment variables has been a topic of curiosity amongst researchers and academics. There is argument on macroeconomic variables that they are determined by the foreign direct investment.

While much research has been conducted to the relationship between macroeconomic activities and foreign direct investment in the advanced economies like Japan Europe and United states, to the best of knowledge the very scarce attempts have been made at discovering the link in rising economies like Nigeria.

The Nigerian economy has witnessed diverse macro-economic routine over the past decade as

the economy is tied to global crude oil price which is mostly unstable. In the 2000 and 2006, Nigerian economy experienced massive success due to the rise in oil while 2007 and 2008, the economy was in crisis due financial crisis, adoption of structural adjustment program and necessary economic reform this negatively affected the foreign direct investments and indeed the general performance of the economy. The government encourages FDI into the country to achieve the aim of economic independence, although it has been assumed that FDI causes possible balance of payment (BOP) problem but the potentials for improving the speed of economic progress of Nigeria cannot be over emphasized. Although the relationship

nature between macroeconomic and foreign direct investment (FDI) variables varies in developed and developing economies.

(Asiedu, 2005) stated that the level of foreign direct investment attracted by Nigeria is indifferent when linked with the potential need and resource based, taken into consideration of the fact that Nigeria is the 8th ranked most populated nation and 32nd largest economy in the world.

(Aliet *et al.*, 2018) investigated that FDI have a fundamental impact on the volatility of macroeconomic activities, and this motivates researchers to examine the relationship between macroeconomic variables and foreign direct investment. Some studies have been showed to examine the Impact of foreign direct investments on macroeconomic variables in Nigeria using GARCH method (Goldiset *al* 2018, Kumari 2018, Udembaet *al.*, 2020 and Rehman *et al* 2021) The results revealed contradictory outcomes on the Impact of Unemployment rate, inflation rate and exchange rate on the foreign direct investments amounts. Most of the previous studies had consensus outcomes on the Impact of the foreign direct investments in Nigeria. In view of the opposing finding of previous studies, this research sets to examine the Impact of foreign direct investments on macroeconomic variables in Nigeria using suitable econometric technique.

## Review of literature

For any study, it's vital to conduct an intensive theoretical understanding by reviewing the past studies and facts on the area. Foreign direct investment leads to rise in investment and improvement in technology which in turns rises efficiency and productivity in the host country. The improved efficiency and productivity results to high output production for both export and local consumption. The export of goods and services brings foreign exchange income to the host country which assists as an engine for economic development.

(Latif *et al.*, 2018) Inflation efficiently decreases the purchasing power of a currency. Moderate or

low level of inflation in a nation can have a significant Impact on the business sector because they can act as incentive to the production. However, high level of inflation can harm a business's productivity by affecting reducing final demand for its output as well as cost of inputs.

Inflation is a continuous rise in general price level in an economy over time, it is a measure of macroeconomic stability. One of the most used measures in gauging the inflation of an economy is consumer price index (Ugwuet *al.*, 2018) In other words, inflation can be defined as the aggregate and continuous rise in the price level of commodities in an economy (Chishitiet *al.*, 2021).

Exchange rate can affect stock prices in numerous ways. Decline in the local currency would lead to inflation, and this would affect the prices negatively. Also, it would lead to rise in price of imported goods which would lead do decrease in companies involved in importation of goods (Agyapong *et al.*, 2019). An increase in the value of a nation's currency will have a favorable Impact on the economy. The higher the value of a nation's currency the more foreigners would like to invest in the country and vice-versa.

(Udembaet *al.*, 2020) Continuous with the earlier preposition, countless empirical investigations have found negative Impact of exchange rate on stock prices, on the other hand, other studies find positive relationship between exchange rate and stock price.

empirical studies have been conducted to examine the Impact of foreign direct investments price on macroeconomic variables. This paper has discussed some such earlier research works and their empirical conclusions that are related to our area analysis.

30 examined the Impacts of exchange rate volatility on the foreign direct investments in south Africa, using the GARCH model for the period 2000 to 2010. Market capitalization was used as proxy to foreign direct investments prices. The study found very weak connection between foreign direct investments and the currency volatility.

Kunle (2018) examined the relationship between foreign direct investment and exchange rate, interest rates, money supply, industrial production inflation rates and money supply in Tokyo. Vector error correction model (VECM) and a monthly observation for each variable for the period January 1971 to December 1990. The findings show that there is positive relationship between Tokyo FDI. Exchange rate, industrial producing, and money supply. While there is a negative relationship between foreign direct investment and interest rate and inflation rate, however they applied johansens 1998 vector error correction analysis to the relationship between the Japanese FDI and exchange rate, money supply, inflation, real economic activities, call money rate, and long-term governmental bond rate. Their conclusion was that there is cointegrating relation and foreign direct investment contribute to this relationship

Bakari *et al.*, (2022) investigate the relationship between Tokyo foreign direct investments and exchange rate, Money supply, industrial production, interest rates and inflation rates. Using a vector Error “Correction Model (VECM) and monthly observations for each variable for the period January 1971 to December 1990; their results show that there is a positive relationship between Tokyo foreign direct investments, exchange rate, money supply and industrial producing. Whereas there is a negative relationship between foreign direct investments and inflation rates and interest rate. They, however, apply Johansen’s (1998) vector error-correction analysis to the relationship between the Japanese foreign direct investments and exchange rate, inflation, money supply, real economic activities, long term governmental bond rate, and call money rate.” They conclude that a co-integrating relation exists and that foreign direct investments contribute to this relation.

Chishti (2021) conducted a study on the relationship between foreign direct investments and exchange rate in 4 South Asian nations; Pakistan, Bangladesh, India, and Sri-lanka for the period 1994 to 2000. The work employed vector

error correction modeling techniques, co-integration, and standard Granger causality tests to examine the short run and long run relationship between foreign direct investments and exchange rates. The outcome of the study showed no short run relationship between the variables for all the 4 nations. There was also no long run association between foreign direct investments and exchange rates for india and Pakistan as well.

Rehman *et al.*, (2021) studied the relationship between nominal exchange rate volatility and dollarization in Nigeria and he used granger causality test for the period of 1986 to 2003 using a quarterly data. The study revealed causality between the variables but the causality from dollarization to exchange rate volatility seems stronger and dominates. However, conclusion was that policies that purpose to decrease exchange rate volatility in Nigeria have to include measures that address the issue of dollarization. But the exact measure of exchange rate volatility in this study was not informed.

Kumari and A (2018) conducted a study on the foreign direct investments and macroeconomics factor: a test of the Arbitrage pricing theory in Nigerian foreign direct investments for the period of 2001 Q1-2010 Q4 with the use of error correction method (ECM) and cointegration were used for the analysis. The finding showed that exchange rate was observed to be negatively associated to foreign direct investments revenues in the short run and long run dynamic model in Nigeria. The study established the presence of cointegration between the variables but however failed to elucidate the extent of the Impact of each variable in both the long run dynamic and short run static

## **Aim and Objective of Study**

The Aim of this study is to find out the Impact of Foreign Direct Investment (FDI) on Economic Growth.

The specific objectives of the study are:

1. To examine the Impacts of FDI on Exchange rate
2. To Assess the Impacts of FDI on inflation rate

## Hypotheses

The hypotheses adopted for the research is as follows:

H0: there exists is no significant relationship between FDI and exchange rate

H1: there exist a significant relationship between FDI and inflation rate

## Methodology

The sample period duration is from 2017 to 2021, consisting of the quarterly data for each variable. Nigerian Foreign direct investments is accessible to the global community around this period. This is an imperative consideration since the exchange rate is one of the major macroeconomic variables. This will allow the study of the extent to which the economy has achieved the basic objective of exchange rate stability.

The time series data was obtained from the Nigerian Security and Exchange Commission NSEC, NSE fact book and annual reports and Central Bank of Nigeria Statistical Bulletin.

## Analysis and Discussions

The study carried out a diagnostic test to determine properties of the times series data used during study. GARCH model 1.1 was conducted to examine the Impact of the relation between FDI price and macroeconomic variables. Also the stationarity of time series variable was determined by augmented Dickey-Fuller test. The null hypotheses were also tested to answer the research questions.

## Co-integration test

Afterhandling the varying lag length recommendations, Johansen test of co-integration using Unrestricted Cointegration Rank Test (Lakshmi & Tuwajri, 2014) and trace statistics for the lags selected was conducted to determine if there is long run or short run equilibrium between the foreign direct investments index and the macro-economic variables (exchange rateand inflation rate).

## Augmented Dickey-Fuller Test of Stationary

The study on time series data supposed that the time series are stationary.

Consequently, it has become significant to examine the stationary status of the data before approximation in order to avoid the problem of false regression. The Augmented Dickey Fuller test (1979-1981) is conducted to test for the existence of a unit root in the time series. It is an extension of the standard Dickey-Fuller test (Maddala and Kim, 1998) Ajideet *al.*, 2022. Generally, the unit root is carried out on individual variables.

## Model specification

The study used the (GARCH) model (1.1) established by Bollerslev (1986) and advanced by Zakoian (1990), Glosten, Nelson (1991), and Jaganathan and Runkle (1993) Fernandez *et al.*, 2020.

The workinitially developed an ARCH model with 2 distinct specifications considered as the first being the conditional mean specified as follows.

$$ER_t = \lambda_0 + \lambda_1 FDI_{t-1} + \varepsilon_t \quad \dots (eq a)$$

$$IR_t = \lambda_0 + \lambda_1 FDI_{t-1} + \varepsilon_t \quad \dots (eq b)$$

Therefore GARCH (1, 1) model is specified:

$$ht = \alpha_0 + \alpha_1 \delta_{2t-1} + \alpha_2 ht-1 + \alpha_i Mi=t + \mu t \quad (eq c)$$

Where:

$Ht$  = "the conditional variance or volatility in ER and IR (dependent variable)

$\pm 0$  = the constant variance (mean)

$\pm 1$  = first order ARCH Impact

$'2t-1$  = one period lagged value of the squared errors (ARCH term)

$\pm 2$  = first order GARCH Impact

$ht-1$  = one period lagged value of the conditional variance or last periods forecast (GARCH term)

$\pm i$  = coefficients of the independent variable (foreign direct investment).

$Mi$  = vector of independent variable (foreign direct investment).

$\alpha t$  = error term

$t$  = time subscript

## Analysis Results

**Table 1 Descriptive statistic for variables**

Variable	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
LFDI	5.503052	7.421345	1.320394	-0.404954	1.304946	11.44204	0.000031
LER	4.694195	3.533221	1.533943	-0.304944	2.139520	10.32245	0.000342
LIR	1.402451	1.954434	0.123449	-0.103694	3.154053	7.956943	0.000002

the table shows that all the macro-economic variables have a positive mean return values, the average foreign direct investment, exchange rate and inflation rate are 5.503052, 4.694195 and 1.402451 values points respectively the observations, which is comparatively normal. The standard deviation of foreign direct investment, exchange rate and inflation rate are 1.320394, 1.533943 and 0.123449 and they are lower than their mean values, thus indicating that their prices have been expressly unstable over the period.

This result is confirmed by the negative skewness values, showing that all the two macroeconomic variables values in the sample are lower than the mean value and the also *P*-values linked with the Jarque-Bera statistics, the test for departure from normality, shows that the variables under study deviates normal distribution.

### Unit Root Test Results

As a requirement for the analysis of time series variables, there is need to ensure that the variables are stationary requires unit root tests of all of the variables in the model. The result of the unit root tests using the Augmented Dickey-Fuller (ADF) test showed that all the variables are stationary at some level  $I(0)$ , and some difference at  $I(1)$ . The results are presented. the initial step of the analysis, unit roots test was carried out to know the stationarity properties to avoid false regression. The result showed that the variables were stationary at levels at 10% only, except inflation rate. Given their probability values that is higher than 5%, and this requires testing at first difference. With the first difference level of the variables, the result showed that, all the variables were stationary at first difference and this means that they were all integrated in order one  $I(1)$ .

**Table 2  
Unit root test result**

Variables	ADF Difference	1%	5%	10%	Prob.	Status
FDI	-6.394561	-4.503921	-2.193046	-1.448202	0.0001	I(1)
ER	-9.934921	-3.402484	-2.220481	-2.193542	0.0001	I(1)
IR	-10.40521	-3.493281	-1.129374	-2.239312	0.0000	I(1)

Variables	ADF levels	1%	5%	10%	Prob.	Status
FDI	-1.293802	-3.128374	-1.293945	-2.493342	0.0059	I(0)
ER	-2.239393	-2.837490	-3.949451	-1.388442	0.0203	I(0)
IR	1.393898	-1.929345	-2.123409	-2.384021	0.1032	I(0)

### Test for ARCH impact

The study tested the null hypothesis ( $H_0$ ) in the second pre- test application of GARCH model is

the ARCH test against the alternative hypothesis which that there is ARCH impact ( $H_1$ ). See Table 3 below

Table 3

F Statistics	91.00245	Obs*R squared	42.11093
Prob. F	0.0001	Prob. Chi square	0.0000

From Table 3 above, the probability of Chi-square is below 5% this indicates that there is ARCH Impact. There is a clustering volatility in the ARCH and residual impact which shows that selected GARCH (1.1) is a suitable analysis. This work, therefore, went ahead to estimate the GARCH model as follows. The result on ARCH

impact and clustering volatility is in alignment with the work of (Babalola and Mohd 2019).

### Conditional Variance Equation in the GARCH (1.1) Model

The result of conditional Variance equation in the GARCH (1.1) Model is presented in Table 4

Table 4

#### Variable: Exchange Rate

Variable	Coefficient	Std.error	Z-statistics	Prob.
FDI	-4.6920	0.3896	-10.4321	0.0001
C	-15.3011	28.7844	-0.1042	0.2595
GARCH	0.4823	0.0239	10.4912	0.0000
R- squared	0.4214			
Adjusted R-Squared	0.4093			

#### Variable: Exchange Rate

Variable	Coefficient	Std.error	Z-statistics	Prob.
FDI	-3.1530	0.3681	-8.9760	0.0078
C	-39.7150	34.9832	-0.4323	0.5632
GARCH	0.5021	0.0346	7.7651	0.0000
R- squared	0.5004			
Adjusted R-Squared	0.5527			

### Discussion of Findings

The conditional Variance equation in the GARCH (1.1) Model which measures the impact of foreign direct investment on ER and IR as the dependent variable. The results are shown in Table 4. And they showed that the ARCH term coefficient is 0.4823 and 0.5021 respectively and for the impact of FDI on ER and IR p-values is 0.0001 which is less than 5% this indicates that previous years of FDI information can influence the volatility of the present year FDI in Nigeria. The results of conditional variance also showed that FDI positive relationship with exchange rate (-0.0920) and the results are statistically significant at (5%). While the FDI has a negative impact and statistically significant with IR, because its coefficient is (-3.1530) and p-value is (0.0078) thus less than (5%) level of significance. The macroeconomic variable in GARCH (1.1) model

are in line with the expectation of the study of (Goldiset *al.*, 2019, Udemaet *al.*, 2020, and Yeboua 2019). Finally the adjusted R-squared value is 0.4093 and 0.5527 which means that 40% and 55% percent for the ER and IR model respectively of the volatility in macroeconomic variable as determined by FDI in the variance equation, this means that there are more determinants of the macroeconomic variables out of the model that positively impact the economic growth variables.

### Conclusion

The result showed that there is no major relationship between the variables in the model. The study concluded that there is no significant impact of foreign direct investment on Nigeria economic growth. This shows that FDI is majorly driven by other factors such as natural resources in Nigeria and the Nigerian government can play

a major role in improving its natural resources, to boost investment in Nigeria. From this study Nigeria needs to compare domestic investment and foreign investment to maintain a standard level of exchange and inflation rate. The study ran GARCH test, conditional variance equation and unit root test, this is to give a liable explanation of the estimates.

### Suggestions

FDI and exchange rate were found to have more impact on economic growth of Nigeria, thus, government should focus on developing appropriate and enabling policies towards attracting FDI in Nigeria. Also, government should improve the investment environment for existing foreign and domestic investors through the availability of power and infrastructure development.

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