



MACRO-ECONOMIC DETERMINANTS AND FOREIGN DIRECT INVESTMENT IN NIGERIA

Peter Damian Chukwu¹, Kelechukwu Ozor², and Ekwere Enang³

¹School of General Studies
Gregory University, Uturu

²Department of Banking and Finance
Alex Ekwueme Federal University, Ndufu-Alike, Ikwo

³Department of Accounting
University of Uyo, Uyo
Corresponding Author: gregoryuniversityuturu.edu.ng

ABSTRACT

This study examines the impact of key macroeconomic factors on foreign direct investment (FDI) inflows into Nigeria, spanning the period 1986-2020. Using an ex-post facto research design, the study investigates the relationships between FDI and four macroeconomic variables: exchange rate, inflation rate, monetary policy rate, and gross domestic product growth rate. The Autoregressive Distributed Lag (ARDL) technique is employed to account for the mixed order of integration among the variables. The results reveal a significant long-run relationship between the macroeconomic variables and FDI. The short-run coefficients indicate that GDP growth rate and monetary policy rate have a positive and significant impact on FDI inflow, while inflation and exchange rate have a negative and significant effect. In the long run, GDP growth rate and exchange rate exert a positive influence on FDI inflow, whereas monetary policy rate has a negative impact. The study's findings suggest that Nigeria's monetary authorities should prioritize policies that promote GDP growth, exchange rate stability, and effective monetary policy to attract FDI and foster economic development.

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

JEL: C1, E6, E56

INTRODUCTION

Foreign Direct Investment (FDI) plays a crucial role in boosting global capital flows, essential for developing nations' growth and development processes. FDI helps bridge the savings and investment gap, supporting domestic resources and promoting economic stability. Developing and less developed nations rely heavily on FDI inflows from more developed counterparts to achieve economic stability. The host nation must provide a conducive investment environment, free from risks and unfavorable economic regulations. Domestic private sector companies often lack financial resources, relying on foreign businesses or individuals to undertake capital-intensive investments.

FDI has numerous positive effects on the economy, including increased capital inflows, enhanced balance of payments, increased exports, technology transfer, new management techniques, and employment growth. Since 1990, FDI has contributed significantly to developing nations'

industrialization, growth, and development. However, Nigeria's macroeconomic volatility, characterized by fluctuations in exchange rates, inflation, and GDP growth rate, poses a challenge to attracting FDI. Studies have shown that macroeconomic stability, including stable prices, rapid GDP growth, and moderate interest rates, attracts international investors.

This study aims to investigate the impact of macroeconomic factors on FDI in Nigeria, building on existing research that has identified various factors influencing FDI. While previous studies have established a significant association between macroeconomic dynamics and FDI, this study seeks to identify the specific factors with the most significant influence.

Wijaya et al. (2020) conducted a quantitative study examining the impact of macroeconomic variables and infrastructure spending on foreign direct investment (FDI) in Indonesia between 1981 and 2018. The variables analyzed included GDP, exchange rate, debt-to-GDP ratio, inflation rate, interest rates, and infrastructure spending. Using cointegration and error correction modeling, the researchers found a long-term and short-term relationship between each variable and FDI.

In contrast, Artantaş and Sipahi (2020) investigated the impact of macroeconomic factors on investment flows in Turkey. The literature highlights the varying responses of countries, including Nigeria, to fluctuations in the macroeconomic environment, resulting in diverse focuses on macroeconomic indicators. This study aims to objectively investigate the impact of macroeconomic factors on FDI in Nigeria, addressing the need for empirical research on this topic. By examining the specific macroeconomic factors influencing FDI in Nigeria, this study seeks to contribute to the existing body of knowledge.

REVIEW OF RELATED LITERATURE

Theoretical framework

This study is grounded in the eclectic theory, which posits that firms engage in foreign direct investment (FDI) when a location's characteristics combine with ownership and internationalization advantages to make it an attractive investment destination (Dunning, 2000). Nigeria's strategic location, with its Apapa Seaport and oil-producing zones, makes it an attractive location for FDI.

Empirical review

Adebayo et al. (2021) investigated the relationships between FDI inflows and macroeconomic indicators in Nigeria from 1981 to 2018 using the ARDL technique and wavelet coherence analysis. The results showed that trade openness and exports had a positive impact on FDI inflows, which was confirmed by robustness analysis using FMOLS and DOLS.

Ukachukwu and Odionye (2020) also examined the effects of macroeconomic factors on FDI in Nigeria from 1981 to 2017 using the ARDL bound co-integration model. The results revealed a long-term association between FDI and macroeconomic variables, with foreign currency rate and crude oil price having a positive impact on FDI in both the short and long terms. Inflation had a negative impact on FDI, while real GDP had a positive short-term impact but a modest long-term impact.

Another study focused on FDI inflows in Turkey, analyzing the relationships between FDI and



macroeconomic variables such as REER, GDP per capita (PPP), exchange rates, inflation, interest rates, and government deficit from 1994 to 2018. The results showed that all explanatory variables had an impact on FDI inflows, with government deficit and exchange rates having a positive influence on FDI in Turkey.

Several studies have investigated the impact of macroeconomic factors on Foreign Direct Investment (FDI) in various countries. Emenuga (2019) examined the effect of macroeconomic factors on FDI inflow into Nigeria between 1986 and 2017, using the ARDL cointegration bound test and error correction model. The results showed a long-term association between macroeconomic factors and FDI, with exchange rate, interest rate, GDP, and government size having a significant impact on FDI.

Meftah and Nassour (2019) used the vector error correction model to investigate the factors affecting FDI, finding a long-term causal relationship between exchange rates and inflation with FDI. However, no factors had an immediate impact on FDI. The Granger causality test showed a causal relationship between GDP and FDI, but not with other variables.

Karau and Ng'ang'a (2019) studied the impact of macroeconomic factors on FDI in Kenya, using data from 1970 to 2010. The results showed that exchange rates, tax rates, inflation rates, interest rates, and balance of payments had a significant impact on FDI.

Onyibor et al. (2021) investigated the relationships between FDI inflows and selected macroeconomic indicators in Nigeria from 1981 to 2018, using the ARDL technique and wavelet coherence analysis. The results showed that trade openness and exports had a positive impact on FDI inflows.

Emel and Ilyas (2022) used the Structural Vector Autoregressive (SVAR) model to examine the impact of FDI on macroeconomic dynamics in Turkey, finding that FDI had a positive impact on domestic investment volume and economic growth. Murtala (2022) empirically explored the impact of FDI on macroeconomic variables (exchange rate, inflation rate) in Nigeria from 2017 to 2021, using the GARCH model. The results showed that FDI had a positive impact on exchange rates, while inflation had a negative impact. The study suggested that Nigeria should implement a proper regulatory framework to attract FDI and boost macroeconomic growth.

METHODOLOGY

Equation 1 provides the functional relationship of the model.

$$FDI = f(GDP, EXR, INF, MPR) \dots \dots \dots (1)$$

The study employed the ARDL model, which uses a bounds testing approach based on the error correction model (ECM), to examine the long-term relationship among the variables. The ARDL model was chosen due to its advantages over competing models, including its ability to be applied regardless of whether the variables are I(0), I(1), or a combination of both. This allows the model to select an appropriate number of lags to capture cointegration among variables.

DATA ANALYSIS AND INTERPRETATION OF RESULTS

Before estimating the model, the stationarity levels of the variables were tested to prevent spurious regression. The Augmented Dickey-Fuller (ADF) test was conducted, and the results are presented in Table 1. The results show that all explanatory variables, except inflation (INF), are stationary after the first difference, indicating that they are integrated of order one, I(1). In contrast, INF is integrated of order zero, I(0). Since none of the variables are integrated at order two, the variables achieve stationarity at orders one and zero.

Given the mix of I(0) and I(1) variables, the ARDL bound test approach, recommended by Pesaran et al. (2001), was used for estimation. After generating 20 models automatically, the ARDL(3, 3, 1, 1, 2) model was selected based on the Akaike information criteria (AIC).

Table 1: ADF test results

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

Source: Researcher’s analysis using E-views 9 output

A crucial condition for conducting the ARDL bounds test is that each variable must be integrated of order one, zero, or a combination of both. Since the variables in this study are integrated of mixed orders, specifically I(0) and I(1), the ARDL bounds test was proceeded with.

The null hypothesis for the bounds test states that the variables are not cointegrated, while the alternative hypothesis posits that they are cointegrated. The decision rule for the bounds test is to reject the null hypothesis if the F-statistic exceeds the upper bound critical values at the chosen significance level.

The results of the ARDL bounds test are presented in Table 2.

Table 2: ARDL bounds test

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

Source: Researcher’s analysis using E-views 9 output

As shown in Table 2, the F-statistic value is 5.014388, which exceeds the upper bound critical value of 4.37 at a 1% significance level. This leads to the rejection of the null hypothesis, indicating the presence of a long-run relationship in the model.

The study concludes that there is a cointegrating relationship between Foreign Direct Investment (FDI) and the selected macroeconomic variables, namely Gross Domestic Product (GDP), Exchange Rate (EXR), Inflation (INF), and Monetary Policy Rate (MPR), in Nigeria.

Given the existence of a long-run relationship, the study proceeds to present the short-run and long-run estimates of the ARDL regression in Tables 3 and 4, respectively. These estimates will provide further insights into the dynamics between FDI and the selected macroeconomic variables in Nigeria.

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

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

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

According to Table 3, the estimated coefficient of the past value of FDI is statistically significant and negative, indicating that the immediate past value of FDI has a negative impact on its current value. This suggests that FDI's past performance influences its current value.

The coefficients of GDP (lag one) and EXR are positive and statistically significant, indicating that changes in exchange rates and economic output attract FDI to Nigeria. This is consistent with expectations, as exchange rate depreciation makes investing in the host economy more affordable and desirable, while a consistent rise in economic output increases aggregate demand, drawing FDI. This finding aligns with previous studies by Ukachukwu and Odionye (2020), Emenuga (2019), and Oloyede and Kolapo (2018).

MPR has a positive and significant impact on FDI, but its negative impact is minor. This suggests that Nigeria's frequent use of monetary policy manipulation to control macroeconomic processes has largely failed to attract FDI, consistent with previous findings (Nwokoye and Oniore, 2017). As expected, inflation has a negative and significant impact on FDI in Nigeria, indicating that an increase in inflation leads to a decrease in FDI due to uncertain investment decisions and a slowdown in FDI. This confirms the findings of Ndubuisi (2017).



The ECM (-1) coefficient is -0.97, indicating that macroeconomic variables correct 97% of FDI disequilibrium from the previous year annually. This means it takes approximately a year for macroeconomic dynamics to remedy FDI disequilibrium.

The coefficient of multiple determination is 0.772952, indicating that approximately 77.2% of FDI variations are explained by the selected macroeconomic variables in the model, demonstrating good explanatory power.

Table 4: Long-run estimates

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

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

The long-run estimates presented in Table 4 reveal that GDP, exchange rate, and inflation have a positive and significant impact on Foreign Direct Investment (FDI) in the long run. In contrast, the Monetary Policy Rate (MPR) has a negative effect on FDI.

Furthermore, the results indicate that GDP, exchange rate, and MPR have a statistically significant impact on FDI in the long run. However, inflation does not exert a significant influence on FDI in the long run in Nigeria.

This suggests that economic growth (GDP) and exchange rate depreciation will continue to attract FDI in the long run, while high inflation rates will not have a significant impact on FDI. Additionally, the negative effect of MPR on FDI implies that monetary policy tightening may deter foreign investment in the long run.

CONCLUSION AND RECOMMENDATIONS:

This study employed the ARDL model to investigate the impact of specific macroeconomic variables on Foreign Direct Investment (FDI) in Nigeria. The empirical results reveal that Gross Domestic Product (GDP) and exchange rates have positive and statistically significant effects on FDI in both the short and long terms. Inflation, however, has a negative and significant impact on FDI in the short term, but its effect becomes positive and insignificant in the long term. Conversely, the Monetary Policy Rate (MPR) has a negative and significant impact on FDI in the short term, but its effect is negligible in the long term.

In conclusion, the study finds sufficient empirical evidence to suggest that macroeconomic factors have a significant influence on FDI in Nigeria during the study period. Based on these findings, policymakers can implement targeted strategies to attract FDI by:

Recommendations

From the forgone, the study proffers thus:



- i. Promoting economic growth through GDP expansion
- ii. Implementing exchange rate policies that attract foreign investment
- iii. Managing inflation to mitigate its negative effects on FDI in the short term
- iv. Adopting monetary policies that support FDI growth in the long term

REFERENCES

- Adebayo, T.S., Onyibor, K. & Akinsola, G.D. The impact of major macroeconomic variables on foreign direct investment in Nigeria: Evidence from a wavelet coherence technique. *SN Bus Econ* 1, 11 (2021). <https://doi.org/10.1007/s43546-020-00018-5>.
- Artantaş, E. and Sipahi, E. (2020). Selected macroeconomic variables and investment inflow in Turkey. *The MIT Press*, 67(2), 297-308.
- Dunning, J.H. (2000). *Multinational enterprises and the global economy*: Edinburgh Gate, Harlow, Addison-Wesley, Wokingham.
- Emel, S. and Ilyas, S. (2022). Does Foreign Direct Investment Affect Macroeconomic Dynamics? An S-VAR Approach for Turkey. *International Journal of Economics and Financial Research*, 8(3):85-103.
- Emenuga, E. (2019). Impact of macroeconomic variables on foreign direct investment flow in Nigeria: ARDL model. *African Journal of Accounting and Financial Research*, 2(1):1-10.
- Emenuga, P. E., (2019). Impact of macroeconomic variables on FDI in Nigeria: ARDL model. *African Journal of Accounting and Financial Research*, 2(1), 1-10.
- Hasli, A., Ibrahim, N. A. and Ho, C. S. F. (2017). The effect of financial crisis and macroeconomic factors on foreign direct investment in developing countries. *International Journal of Economics and Financial Issues*, 7(1), 31-36.
- İlyas, S. and Merve, K. (2018). FDI and macroeconomic stability: the Turkish case. *European Financial and Accounting Journal*, 13(1), 19-40.
- Karau, J. and Ng'ang'a, P. (2019). Effects of macroeconomic factors on FDI in Kenya. *European Journal of Business and Management*, 11(3), 55-62.
- Kurul, Z. and Yalta, Y.A. (2017). Relationship between institutional factors and FDI flows in developing countries: new evidence from dynamic panel estimation. www.mdpi.com/journal/economies, 1-10
- Kwoba, M.N. and Kibati, P. (2016). Impact of selected macroeconomic variables on foreign direct investment in Kenya. *International Journal of Economics, Finance and Management Sciences*, 4(3), 107-116.
- Meftah, S. and Nassour, A. (2019). Macroeconomic variables and foreign direct investment inflows in Turkey. *Jurnal Ilmu Ekonomi*, 8(2), 195 – 206.



- Murtala, Said, Impacts of Foreign Direct Investments on Nigeria's Economic Growth 2017-2021. Available at SSRN: <https://ssrn.com/abstract=4150058>
- Ndubuisi, P. (2017). An analysis of the impact of macroeconomic variables and foreign direct investment in Nigeria: a VECM Granger causality framework. *Journal of Business and Economic Development*, 2(3), 187-197.
- Ndugbu, M., Duruechi, A. and Ojiegbe, J., (2017). Macroeconomic Policy Variables and Foreign Direct Investment in Nigeria. *International Journal of Banking and Finance Research*, 3(2), 112-136.
- Nwokoye, E.S. and Oniore, J.O. (2017). Impact of monetary policy on capital inflows in Nigeria. Business, Management and Economics Research. *Academic Research Publishing Group*, 3(10), 192-200.
- Oloyede, J. A. and Kolapo, F. T. (2018). Sensitivity of foreign direct investment to macroeconomic variables in Nigeria. *Advances in Social Sciences Research Journal*, 5(7), 409-427.
- Onakoya, A.B. (2016). Foreign direct investments and economic growth in Nigeria: a disaggregated sector analysis. *Journal of Economics and Sustainable Development*, 3(10), 66-75.
- Organization for Economic Co-operation and Development (2019). *International direct investment statistics*. Retrieved from <https://data.oecd.org/fdi/fdi-stocks.htm>
- Pesaran, M., Shin, Y. and Smith, R. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-326.
- Rengasamy, D. (2017). Impact of macroeconomic factors on foreign direct investment (FDI): evidence from ASEAN countries. *International Journal of Advanced Scientific Research and Management*, 2(10), 49-58.
- Sabir, S. and Qureshi, S. (2018). Do macroeconomic factors affect FDI: evidence from South Asian Countries? DOI: <https://doi.org/10.21203/rs.3.rs-27489/v1>
- Ugonna, E. and John, C. (2022). Foreign direct investment and economic growth in Nigeria. *GPH-International Journal of Business Management*, 5(11):76-89.
- Ukachukwu, O. and Odionye, J. (2020). Impact of selected macroeconomic variables on foreign direct investment in Nigeria: Auto-regressive distributed lag (Ardl) model. *International Journal of Economics, Commerce and Management*, 5(12):2020.
- Ukachukwu, O.E. and Odionye, J. C. (2020). Impact of selected macroeconomic variables on foreign direct investment in Nigeria: auto-regressive distributed lag (ARDL) Model. *International Journal of Economics, Commerce and Management*, 8(12), 41-55.



Wijaya, A., Astuti, D., Tarigan, Z. and Edyanto, N. (2020). Determinants of foreign direct investment in Indonesia: Evidence from co-integration and error correction modeling. SHS Web of Conferences 76, 01002. <https://doi.org/10.1051/shsconf/20207601>.