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Macroeconomics Variables And Foreign Direct Investment Inflows In Nigeria

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ABSTRACT:
The paper x-rayed the impact of macroeconomic variables on the foreign direct investment inflows into Nigeria. The ex-post facto research design was adopted, and aggregate Secondary, annual time series data sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and World Bank statistical database for 1984-2021 were utilized. The data collected were analyzed using the Ordinary Least Squares estimation technique of multiple regression analysis, the Autoregressive Distributed Lag (ARDL)approach to the co-integration test and the Vector error correction model. Findings indicated that a long-run and short-run relationship exists between macroeconomic variables and FDI. Also, the exchange and interest rates negatively and significantly impacted FDI inflows into Nigeria. In contrast, GDP and inflation rate negatively impacted FDI inflows into Nigeria, but the impact was insignificant. On the other hand, external reserves positively and significantly impacted FDI inflows into Nigeria. The study, among other things, recommends that the monetary authorities maintain a single exchange rate for the economy to reduce the activities of the currency manipulators. Also, the government should reduce corruption-laden expenditures, such as subsidy regimes, to improve the level of our external reserves that will help support our currency. Policies such as tax holidays and genuine diversification of the economy should be rigorously pursued. Furthermore, a moderate contractionary monetary policy should be pursued. Finally, the government should improve the infrastructure, such as adequate power supply, to reduce operating costs and interest bank charges.

KEYWORDS: *Foreign direct investment, macroeconomic variables, ARDL co-integration, external reserve, and Nigeria.*

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INTRODUCTION

Among the primary objectives of any Government is to ensure the proper functioning of the economy and the well-being of its citizens through full employment, economic growth, price stability and a favourable balance of payment. These can be achieved through the process of industrialization. To ensure this, economies, especially developing economies, have adopted external development finance, in which foreign direct investment is primary and can greatly enhance the government's industrialization process and development goals by helping to finance investment (Ojiaku & Odionye, 2020). The last three decades have witnessed an astronomical development in economic globalization and its attendant effect of increased capital mobilization (Sikler & Sikler, 2022), and FDI has been at the forefront of global capital mobility. The importance of FDI can never be overemphasized; this ranges from serving as an important catalyst that

lubricates the engine of economic growth and development that translates into an increase in the standard of living of the people, transfer of technology and managerial skills, favourable effect on balance of payment by stimulating export and contributed to the increase in trade integration (Adebayo et al., 2021; Enu *et al.*, 2013). That is why developing and emerging economies rely heavily on FDI as their main source of foreign financing (Mansaray, 2017; Boateng *et al.*, 2015).

Though FDI flows are driven by the perceived opportunities that can be derived from the utilization of foreign capital injection into the economy to add to domestic savings and promote economic growth and development (Aremu, 1997), its inflows send a positive signal regarding the economic prospects and attractiveness of investment in a country (Wei & Zhu, 2007). As we operate in a highly competitive environment, economies strive to gainmore global productive activity associated with any industry through trade and FDI policies. Investment decisions by firms, especially Multinational Enterprises (MNEs), which primarily drive FDI flows, are adopted based on scenario analysis in which firm-specific advantages are compared regarding the costs of investments in diverse locations. However, MNEs also weigh macroeconomic factors before deciding on the position of FDI inflow (Sujit *et al.*, 2020). Aguiar and Gopinath (2007) maintained that emerging economies face a greater risk than advanced nations due to macroeconomic instability. The principal among these possible threats is the sudden economic slowdown of the developing nations, which is an essential consideration that may interrupt investing firms' activities (Adebayo *et al.*, 2021; Siklar & Kocaman, 2018).

Nigeria, in a bid to advance and ensure all-round growth and development, has had a checked history of economic and political development, which reflects in the erratic inflows of FDI, changes in political and policy regimes as well as uneven growth patterns, has evolved and designed various public sector policies and reforms aimed at macroeconomic stability to position Nigeria as the preferred FDI flow destination. Despite these reforms, serious challenges still hamper the massive attraction of FDI inflows to Nigeria compared to other emerging economies such as Malaysia, Thailand, Vietnam, Brazil, and Mexico. In the analysis of the past trends of FDI inflows into Nigeria, FDI stood at $1.96 billion in 1994, then gradually declined to $1.14 billion in 2000 and rose drastically to $4.98 billion in 2005. Slowly increased to $6.03 billion in 2010 and fell further to $3.34 billion in 2015; the decline continued to 2020 when the volume of FDI inflows to Nigeria stood at $2.39 billion (World Bank, 2022). A closer view of the trend of the macroeconomic variables revealed a very volatile condition.

Furthermore, the nexus between macroeconomic variables and FDI flow has been a major point of debate among scholars, as there is still no consensus on the relationship between FDI inflows and selected major macroeconomic variables. This will make it imperative to examine how interest rate, economic growth, exchange rate, external reserve and inflation influence FDI inflows into Nigeria. Thus, this paper intends to add to the ongoing research by further investigating this relationship from the Nigerian context.

LITERATURE REVIEW

Foreign direct investment can be described as a movement of capital and other resources from a parent corporation in the home country to the subsidiary company, which is created through substantial equity interest in the firm established in the host country (Pugel, 1981). Similarly, Adebayo *et al.* (2021) maintained that FDI is an investment aimed at controlling company ownership in one nation by an organization created in another. Also, Sujit *et al*. (2020) defined FDI as the establishment of new firms or acquisitions of companies or assets in another country. Thus, Physical investments made directly to the owners of assets in another country are termed foreign direct investments. The idea of direct control differentiates foreign direct investment from foreign portfolio investment.

According to Adebayo et al. (2021), FDI can be utilized as a tool to support sustained development in emerging economies such as Nigeria, even as Dunning (1980) maintained that the future advantages of MNE's participation in FDI operations are the low cost of production, effective supply in new locations, the management of strategic assets, and the creation of governance in foreign market practices then increased profitability. That is why FDI flow is largely industry-specific, and hence, the determinants of the industry pattern of FDI are directly related to characteristics of market structure and market conduct across industries (Pugel, 1981). Understanding this, economies strategize incentive policies to attract FDI in their respective countries.

Empirical review

Ojiaku and Odionye (2020) believe that the environment in which businesses function is influenced by several forces, one of which is its macroeconomic performance. Therefore, the stability and instability of the macroeconomic performance indicators reflect a country's economic situation, and the level of business activities and growth determines the attractiveness of the inflow of foreign direct investments into the country. Empirical studies such as Onyibor and Akinsola (2021), Kueh and Soo (2020), Bosire (2018), Agrawal (2015) and Yol and Teng (2009) have supported the existence of a relationship between FDI and macroeconomic variable. The stability of the macroeconomic variables goes a long way to reflect the condition of the host economy, and participants in FDI keep a very close watch on them as it aids decisions on the destination of the investment. Economies with volatile macroeconomic environments may suggest higher risk levels and discourage FDI inflows against economies with more stable macroeconomic variables. Aguiar and Gopinath(2007) maintained that emerging economies face a greater risk than advanced nations due to macroeconomic instability, thus attracting more FDI. Therefore, Akinlo (2004) posited that for any economy to attract FDI, it must first improve and ensure stability in its economic environment by enabling it for investors.

Using yearly data from 1981 and 2018 from the CBN Statistical Bulletin, Adebayo et al. (2021) examined the linkages between FDI inflows and some selected macroeconomic indicators (exports, gross capital formation, trade openness, inflation, and economic growth). The ARDL and wavelet coherence techniques were adopted to evaluate the data collected. The findings from the ARDL long-run estimate reveal that exports and trade openness exert a positive impact on FDI inflows. Furthermore, the results of the wavelet coherence-based causality and wavelet correlation techniques further provide supportive evidence for the ARDL technique.

With evidence from Cambodia, Laos, Myanmar, and Vietnam, Kueh and Soo (2020) explored the link between FDI inflows, market size, exchange rate, labour force, and inflation using yearly data between 2000 and 2016. The relationship was examined using co-integration, FMOLS, and panel Granger causality. The findings indicated that co-integration exists among the variables employed in the long run. Also, a one-way causality was found running from inflation and exchange rate to FDI inflows.

AsiamahOfori and Afful (2020) analyzed the determinants of FDI inflows in Ghana by utilizing time-series data between 1985 and 2015. The findings from the result of the OLS regression revealed that government expenditure, infrastructure, and external debt exerted a significant impact on FDI inflows. In contrast, the Granger causality test revealed a one-way causality from the interest rate, government expenditure, and inflation to FDI inflows.

Ojiaku and Odionye (2020) study examined the impact of selected macroeconomic variables on foreign direct investment in Nigeria. Data was sourced from the Central Bank of Nigeria Statistical Bulletin between 1981 and 2017. In analyzing the data collected, the Auto-Regressive Distributed Lag (ARDL) bound co-integration model was utilized to examine the short-run and long-term impacts of the selected variables on FDI. Findings indicated that a long- and short-run relationship between FDI and selected macroeconomic variables exists in Nigeria. Foreign exchange rates, gross domestic product, and crude oil prices positively and significantly impacted FDI in the short and long run. At the same time, inflation negatively and significantly impacted FDI in the short and long run.

Relying on data from the US for the period 1960–2019 sourced from the Federal Reserve Economic Data (FRED) database and the World Bank Governance Database, Sujit *et al*. (2020) evaluated the impact of macroeconomic, governance and risk factors on foreign direct investment (FDI) intensity. The ordinary least square regression method was used in analyzing the data collected, and the result suggested that infrastructural investments, exchange rate, corporate profitability, exports and imports all had positive and significant impacts, while inflation and regulations negatively related to FDI intensity.

Employing time-series data between 1975 and 2017, Borhan and Subramaniam (2020) explored the interactions between FDI inflows, market size, inflation, economic growth, exchange rate, and trade openness in India. The short- and long-run dynamics between FDI inflows and the other macroeconomic variables were investigated by utilizing the ARDL techniques. The bound test reveals co-integration among the variables in the long run. Furthermore, there is a positive link between FDI inflows and economic growth, even though the interest rate and inflation impact FDI inflows negatively. Additionally, there was no interaction between FDI inflows and the other macroeconomic variables in the short run.

Musyoka and Ocharo (2018) evaluated the impact of inflation, competitiveness exchange rates, and interest rates on FDI inflows in Kenya, utilizing annual data from 1970 to 2016. The OLS technique was the preferred estimation technique, and findings revealed that exchange rate and interest rate negatively impacted FDI inflows. At the same time, inflation had an insignificant impact on FDI inflows in Kenya. Utilizing a GLS estimation method on Panel data from 12 eastern African economies spanning between 2004 and 2016, Bosire (2018) investigated the determinants of FDI inflows. Results suggested that exchange rate and economic growth positively impact FDI inflows, while interest rate negatively impacts foreign direct investments.

Mansaray (2017) examined the macroeconomic determinants of foreign direct investment inflows into post-conflict Sierra Leone from 2002-2015. Utilizing co-integration and VECM in evaluating the data collected, findings from the study suggested that trade openness and interest rate had a positive and significant impact on FDI flows, Gross fixed capital formation, inflation rate and exchange rate exerted a positive but insignificant impact on FDI flows. At the same time, GDP negatively and significantly impacted FDI flows in Sierra Leone.

To investigate Determinants of foreign direct investment and its causal effect on economic growth in Nigeria, Florence et al. (2017) used annual time-series data ranging from 1984 to 2015 that was analyzed using VECM techniques to investigate this dynamic relationship. The result indicated that a long-term co-integration exists among the variables. Also, economic growth, inflation, exports, and interest rates have had a negative impact on the FDI inflows into Nigeria.

Using time-series data from India between1981 and 2014, Sultana (2016) explored the impact of macroeconomic variables on FDI inflows in India. Adopting the co-integration Granger causality test as an analytical technique, the findings suggested that interest rate and inflation have a negative relationship with FDI inflows. In contrast, exchange rate, exports, imports, and economic growth positively impact FDI inflows. Additionally, the Granger causality test revealed a one-way causality between imports and economic to FDI inflows in India, while a feedback causality was found between exports and FDI inflows. Uwubanmwen and Ogiemudia (2016) evaluated the impact of foreign direct investment on economic growth in Nigeria using annual time series data covering the period 1979 to 2013 sourced from the Central Bank of Nigeria Statistical Bulletin. The data were analyzed using the Error Correction Model. Findings suggested that in the short run, FDI has a positive and significant impact on the economic growth of Nigeria, while the impact was not significant in the long run.

With evidence from the BRICS (Brazil, Russia, India, China and South Africa) economies, Agrawal (2015) evaluated the impact of foreign direct investment on economic growth. Data collected from 1989 to 2012 was analyzed using Co-integration and Causality analysis. The results indicated a long-run equilibrium relationship between foreign direct investment and economic growth. Also, causality tests indicate that long-run causality runs from foreign direct investment to economic growth in these economies.

Otto and Ukpere (2014) examined the impact of foreign direct investment on economic development and growth in Nigeria. Data was collected over 41 years, sourced from the CBN Statistical Bulletin, and multiple regression analysis was the preferred estimation technique in analyzing the data collected. Results indicated that foreign direct investments positively and significantly impacted Nigeria's economic growth.

Enu *et al.* (2013) evaluated the determinants of foreign direct investment inflows to Ghana, relying on data from 1980 and 2012. Johansen's co-integration approach was adopted in analyzing the data collected. Results revealed that the variables were not co-integrated, so the vector autoregressive model was estimated. The result showed that the first year of foreign direct investment, the last two years of exchange rate and trade openness were statistically significant.

Vijaykumar *et al.* (2010) investigated the determinants of FDI in BRICS countries' panel co-integration. Findings revealed that GDP, labour cost, infrastructure, real exchange rate, and gross capital formation significantly impacted FDI flows in BRICS.

Yol and Teng (2009) evaluated the domestic determinants of foreign direct investment flows in Malaysia. The Error correction methodology was adopted, and findings reveal that Real Exchange rate, GDP growth and infrastructure investments positively influenced FDI flows, while export volume negatively influenced FDI flows.

The empirical literature above proved that there still needs to be a consensus on the relationship between FDI inflows and macroeconomic variables. A proper review showed that most empirical works employed macroeconomic variables such as inflation, GDP, and exchange rate. To the authors' knowledge, no previous studies have used external reserves as a proxy for macroeconomic variables. Also, the data used did not reflect recent events. Hence, this study was undertaken using recent data to fill these gaps.

METHODOLOGY

The ex-post facto research design was adopted, given the nature and scope of the investigation. Secondary annual time series data for the variables under investigation were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Bank database. The dataset covered the period 1984 to 2021, which was predicated on the accessibility and availability of data. In analyzing the data collected, the paper employed the ordinary least squares estimation technique of multiple regression analysis, the Autoregressive Distributed Lag (ARDL) approach to the Co-integration test and the Vector error correction model. Furthermore, other complementary diagnostic tests, such as the unit root, serial correlation, heteroscedasticity, and stability tests, were conducted to avoid spurious results.

To estimate the models in equations (3) and (4), the Autoregressive Distributed Lag (ARDL) method developed by Pesaran *et al.* (2001) was utilized. This choice was based on the assumption that the ARDL technique is more appropriate for small sample size and can be implemented irrespective of whether the underlying variables are I (0) or I (1) and provides very efficient and consistent test results in small and large sample sizes. Under this approach, the long-run and short-run parameters of the model are estimated simultaneously.

Model Specification

In an attempt to evaluate the impact of macroeconomic variables on foreign direct inflows into Nigeria, the model of Musyoka and Ocharo(2018) was adapted and then modified to reflect the objectives of the study. The model stated as follows:

$$FDI = f(EXG, EXT, GDP, INFL, INTR)\ldots \quad 1$$

The implicit form of the natural log is expressed as:

$$\ln FDI_t = \beta 0 + \beta 1 \ln EXG_t + \beta 2 \ln EXT_t + \beta 3 \ln GDP_t + \beta 4 \ln INFL_t + \beta 5 \ln INTR_t + \mu_t \quad 2$$

Where,

FDI	=	Foreign Direct Investment
EXG	=	Exchange rate to the dollar
EXT	=	External reserve
RGDP	=	Real Gross domestic product
INFL	=	Inflation rate
INTR	=	Interest rate

From equation (2), the long-run relationship can be written as:

$$\ln FDI_t = \lambda_0 + \lambda_1 \ln EXG_t + \lambda_2 \ln EXT_t + \lambda 3 \ln GDP_t + \lambda 4 INFL_t + \lambda 5 \ln INTR_t + \mu_t \quad 3$$

While the error correction representation of the series used to estimate the short-run association can be specified as follows:

$$\Delta \ln FDI_t = \lambda_0 + \lambda_1 \Delta \ln EXG_t + \lambda_2 \Delta \ln EXT_t + \lambda 3 \Delta \ln GDP_t + \lambda 4 \Delta INFL_t + \lambda 5 \Delta INTR_t + \eta ECMt\text{-}1 + \varepsilon t \quad 4$$

In the above model, Δ is the first-difference operator, and λ indicates long-run coefficients.

The hypothesis of no co-integration deals with H0: $\lambda 1 = \lambda 2 = \lambda 3 = \lambda 4 = \lambda 5 = 0$

and H1: $\lambda 1 \neq \lambda 2 \neq \lambda 3 \neq \lambda 4 \neq 0$ is an alternative hypothesis of co-integration.

The *a priori* expectation of the parameters is given as β_2 and $\beta_6 < 0$, β_3, β_4 and $\beta_5 > 0$

Table 1: Synopsis of Variables' Measurement/Description

Name of variable	Acronym	Measurement	Source	*a priori* expectations
Foreign direct investment	FDI	Foreign Direct Investment inflows into Nigeria	World Bank statistical database	
Exchange rate	EXG	Nominal exchange rate to the dollar	CBN (2021)	Negative (-)
External reserve	EXT	Average value of Nigeria external reserve	CBN (2021)	Positive (+)
Real Gross domestic product	GDP	Value of Gross Domestic Product	World Bank statistical database	Positive (+)
Inflation rate	INFLA	Rate of Inflation in the economy	CBN (2021)	Positive (+)
Interest rate	INTR	Maximum lending rate	CBN (2021)	Negative (-)

Source: Field survey (2023)

RESULTS AND DISCUSSIONS

Estimation of the econometric model specified in this study was preceded by an examination of the statistical properties of the series, which is presented in Table 2.

Table 2 shows the mean value for the exchange rate, external reserve, FDI, RGDP, inflation rate and interest rate to beN80.10, 20520.33, 17.98, 2862.216, 19.5% and 23%, respectively. Also, within the study period, the standard deviation for exchange rate, external reserve, FDI, RGDP, inflation rate, and interest rate were57.88,17515.74, 2548.015, 19.14 and 5.16.

Moreover, the skewness value of 0.30, 0.42, 1.05, 0.39, 1.84 and 0.01 was observed for the exchange rate, external reserve, FDI, RGDP, inflation rate and interest rate, respectively, showed the positive distribution of the value curve, which indicates that the value tends to increase as the years increase. Furthermore, the kurtosis value for the exchange rate, external reserve, FDI, RGDP, inflation rate and interest rate were 2.34, 1.66, 2.89, 1.56, 5.28, and 3.15, respectively. Since the variables all had average kurtosis ≥ 2, this indicates the existence of platykurtic characteristics in the series.

Table 2: Summary Statistics, using the observations 1984 – 2021

	EXG	EXT	FDI	RGDP	INFL	INTR
Mean	80.10855	20520.33	2862.216	5.18E+11	19.50945	23.49501
Median	94.10171	10277.49	1874.040	3.92E+11	12.16854	22.62250
Maximum	200.1593	58472.88	8914.890	1.09E+12	76.75887	36.09000
Minimum	0.741667	981.8083	193.1400	1.03E+11	0.223606	11.75000
Std. Dev.	57.88804	17515.74	2548.015	3.60E+11	17.98396	5.163490
Skewness	0.303349	0.425833	1.052063	0.398043	1.840019	0.013436
Kurtosis	2.341150	1.663364	2.899818	1.563881	5.284425	3.155838
Jarque-Bera	1.236673	3.872562	6.840970	4.156630	28.92365	0.038554
Probability	0.538840	0.144239	0.032697	0.125141	0.000001	0.980908
Sum	2964.016	759252.2	105902.0	1.92E+13	721.8497	869.3154
Sum Sq. Dev.	120636.9	1.10E+10	2.34E+08	4.66E+24	11643.22	959.8185
Observations	37	37	37	37	37	37

Source: Computation by authors with E-view 9.0.

Conducting time series analysis, variables should be tested for unit root before further operations. Though the ARDL framework may not require pretesting, the aim is to ensure that I(2) variables do not exist. In this study, the conventional Augmented Dickey-Fuller ADF test for unit root was conducted, and the result is presented in Table 3.

Table 3: Summary of Augmented Dickey-Fuller (ADF) Unit Root Tests Result

Variables	ADF Test Statistics	Critical Values @ 5%	P-value	Order of Integration
*Ln*FDI	-3.529794	-2.938987	0.0123	I(1)
*Ln*EXG	-8.825090	-3.595026	0.0000	I(1)
*Ln*EXT	-3.976082	-3.557759	0.0200	I(1)
*Ln*FDI	-4.241243	-3.552973	0.0105	I(1)
*Ln*INFL	-4.771214	-3.540328	0.0025	I(0)
*Ln*INTR	-3.764297	-3.540328	0.0305	I(0)

Source: Computation by authors with E-view 9.0.

The ADF result presented in Table 2suggests that the time series were integrated of mixed order since comparing the t-statistic values of foreign direct investment, exchange rate, external reserve, gross domestic product, interest rate and inflation rate in which their respective t-statistics are greater than the critical values, it therefore suggest the series were stationary at first difference.

ARDL Bounds Test

Given that it has been established that the I(2) variable does not exist in series, the conditions for the ARDL framework have been satisfied, the ARDL bound testing approach to co-integration was conducted, and the result is presented in Table 4**.**

Table 3: Result of the ARDL Bounds Test for Co-integration

Variable	F-statistics	Co-integration
F(FDI/EXG, EXT, GDP, INFL, INTR)	4.201725	Cointegration
Critical value	Lower bound	Upper bound
10%	2.26	3.35
5%	2.62	3.79
1%	3.41	4.68

Source: Computation by authors with E-view 9.0.

From the result in Table 3, the F-statistic coefficient of 4.20, which is greater than the upper bound and lower bound values of 2.62 and 3.79 at a 5 per cent level of significance, supports the conclusion that a long-run relationship exists between foreign direct investment, exchange rate, external reserve, gross domestic product, interest rate and inflation rate, which is a desired outcome. With evidence of co-integration, the next step is to estimate the long-run parameters and the result presented in Table 4

Table 4: Estimated long-run relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNEXG	-0.505186	0.139962	-3.609453	0.0036
LNEXT	0.657735	0.376336	1.747733	0.1060
LNGDP	0.311646	0.675263	0.461519	0.6527
LNINFL	-0.386553	0.242146	-1.596363	0.1364
LNINTR	-6.555629	1.419862	-4.617089	0.0006
C	16.729517	16.576848	1.009210	0.3328

Source: Computation by authors with E-view 9.0.

The result presented in Table 4 shows that the exchange rate negatively and significantly impacts foreign direct investment. This is based on a coefficient and P-value of -0.501 and 0.00, respectively. This is consistent with *an a priori* expectation, suggesting that exchange rate depreciation makes investment in the host country cheaper and attractive, increasing FDI in the country. The external reserve, with a coefficient and P-value of 0.65 and 0.10, respectively, confirmed the positive impact of external reserve on foreign direct investment in Nigeria, but the impact is non-statistically significant. This condition also aligns with *a priori* expectation and theoretical postulation.

Furthermore, the gross domestic product expressed a positive but insignificant impact on foreign direct investment in Nigeria, judging from its coefficient and P-value of 0.31 and 0.65, respectively. This is consistent with the theoretical postulation and findings of Borhan and Subramaniam (2020) and Uwubanmwen and Ogiemudia (2016) but inconsistent with the findings of Adebayo et al. (2021). On the other hand, the inflation rate transmitted a negative and insignificant impact on foreign direct investment in Nigeria. This was evidenced by the coefficient and P-value of -0.38 and 0.13, respectively. The result was also in line with *a priori* expectations and the findings of Borhan and Subramaniam (2020) but also inconsistent with the findings of Adebayo et al. (2021). Finally, the interest rate impacted negatively and significantly on foreign direct investment in Nigeria, judging from its coefficient and P-values of -6.55 and 0.00, which is also consistent with *a priori* expectations and the findings of Bosire (2018).

Short-Run Dynamic Regression Results

After the estimation of the long-run parameters, the short-run dynamic parameters within the ARDL framework were also estimated, and the result is presented in Table 5

Table 5: Result of the Short-run error correction estimate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGFDI(-1))	-0.653806	0.270043	-2.421117	0.0323
D(LOGFDI(-2))	-1.522744	0.273925	-5.558978	0.0001
D(LOGFDI(-3))	-0.823620	0.229411	-3.590143	0.0037
D(LOGEXG)	-0.468750	0.185845	-2.522255	0.0268
D(LOGEXT)	0.610295	0.240684	2.535667	0.0261
D(LOGGDP)	-0.248870	0.741674	-0.335553	0.7430
D(LOGGDP(-1))	-0.806952	0.911625	-0.885180	0.3935
D(LOGGDP(-2))	-1.508382	0.918026	-1.643071	0.1263
D(LOGGDP(-3))	2.564611	0.723038	3.546996	0.0040
D(LOGINFL)	-0.139787	0.112331	-1.244423	0.2371
D(LOGINFL(-1))	-0.276293	0.095086	-2.905725	0.0132
D(LOGINFL(-2))	0.361941	0.125009	2.895306	0.0134
D(LOGINFL(-3))	0.295515	0.110204	2.681535	0.0200
D(LOGINTR)	-3.013820	1.271644	-2.370018	0.0354
D(LOGINTR(-1))	-0.474599	0.809599	-0.586214	0.5686
D(LOGINTR(-2))	1.325173	0.671805	1.972556	0.0720
ECT(-1)	-0.927875	0.294144	-3.154491	0.0083

Source: Computation by authors with E-view 9.0.

Results of the short-run dynamic coefficients in relation to the long-run association derived through the ECT equation, as shown in Table 5, revealed that the lagged error-correction term was as desired, negatively signed at -0.927 and significant at the 5% level, which supports the view indicating the existence of a short-run association between the variables. It also suggests that its adjustment speed of returning to equilibrium after a period of shock seems very high at 92.7 per cent.

Furthermore, the directions expressed by the short-run dynamic effect were not entirely maintained in the long run. A close examination revealed that the exchange rate negatively and significantly impacted foreign direct investment in Nigeria. This is evidenced in the coefficient and P-values of -0.468 and 0.02, which is consistent with *a priori* expectation and the findings of Adebayo *et al.* (2021), Sujit *et al.* (2020), Ojiaku and Odionye (2020), Musyoka and Ocharo (2018) and Sultana (2016). Also, external reserves positively and significantly impacted foreign direct investment in Nigeria. This conclusion is based on the coefficient and P-values of 0.61 and 0.02, which are consistent with *a priori* expectations. Gross domestic product expressed a positive but insignificant impact on foreign direct investment in Nigeria in all the lag periods. This is inconsistent with a priori expectations but aligns with the findings of Adebayo *et al.* (2021); this may result from the Nigerian economy's structure, which relies heavily on oil and gas as its mainstay. Meanwhile, the inflation rate negatively and significantly impacted the foreign direct investment inflows into Nigeria. This is also in line with *a priori* expectation and the findings of Ojiaku and Odionye (2020), Musyoka and Ocharo (2018) and Sultana (2016)

Finally, interest rates negatively and significantly impacted foreign direct investment inflows into Nigeria. This is based on the coefficient and P-value -3.01 and 0.03, respectively. This is consistent with *a priori* expectations and the findings of Musyoka and Ocharo (2018), Bosire (2018) and Florence et al. (2017).

Results of diagnostic tests

To ensure the reliability of the results, tests for heteroscedasticity, serial correlation, and stability of the model were conducted, and the outcome of the diagnostic test was presented in Table 6.

Table 6. Results of diagnostic tests

	Test Statistics	P-value
Breusch-Godfrey Serial Correlation test	0.185185	0.8437
ARCH Heteroskedasticity Test	3.192916	0.0841
Ramsey RESET Test (log-likelihood ratio)	0.236906	0.6360

Source: Computation by authors with E-view 9.0.

Based on the result in Table 6, the tests show that the model performed well in all the diagnostic tests conducted. The result shows no suspicion of serial correlation among variables and no evidence of heteroscedasticity in the model. Ramsey reset test result indicates no evidence of omitted variable problem in the results, suggesting the result cannot be regarded as being spurious and can be relied upon,

CONCLUSION AND POLICY IMPLICATION

The study evaluated the impact of macroeconomic variables on FDI inflows in Nigeria, relying on time series data sourced from the CBN statistical Bulletin for the period covering 1986 to 2020. The study used the bounds testing (ARDL) approach to co-integration and other diagnostics tests to analyze the data collected. Given the strength of the empirical analysis of the secondary data, findings from the study indicated a long-run and short-run relationship between macroeconomic variables and FDI. Based on the findings of this study, the study recommended that monetary authorities maintain a single exchange rate for the economy to reduce the activities of currency manipulators. Also, the government should reduce corruption-laden expenditures, such as the subsidy regime, to improve the level of our external reserves, which will help support our currency and instil confidence in the economy. Policies such as tax holidays and genuine diversification of the economy should be rigorously pursued. Furthermore, a moderate contractionary monetary policy should be pursued to reduce inflation. Finally, the government should improve the infrastructure, such as adequate power supply, to reduce operating costs and interest bank charges.

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