

Original Article

Unpacking the Nexus between Foreign Direct Investment and Poverty Level in Nigeria

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Abstract: Given the incidence of poverty in Nigeria, the need arises to investigate how responsive poverty is to FDI inflows. The trend of FDI in Nigeria reflects the country's economic and political situation, as well as global and regional factors that shape the investment climate. The study examines the nexus between foreign direct investment and poverty level in Nigeria spanning from 1984 to 2022. The study utilised secondary data and adopted the Augmented Dickey-Fuller Unit Root Test, the Granger causality technique, and the Autoregressive Distributed Lag model, which is robust to heteroscedasticity and autocorrelation. The result on FDI_INFLOW indicates a negative and positive coefficient at lag 2. This means that a one percent increase in FDI_OUTFLOW level results in a 0.04 percent increase in poverty in Nigeria in the short run. This implies that FDI net outflow enhances poverty. The cointegration equation indicates the speed at which the economy can recover to the equilibrium position. The coefficient indicates that the economy will recover at a 63% speed of adjustment to the equilibrium position. Findings suggested that inward foreign direct investment had a significant and negative impact on poverty in Nigeria. Also, the findings indicated that outward foreign direct investment is positive but not significant. The Granger causality test results indicate that a two-way causal relationship exists: poverty Granger-causes foreign direct investment, and foreign direct investment Granger-causes poverty. This implies a bidirectional causality. The study's results have provided important insights. The results indicate that inward foreign direct investment reduces the poverty rate in Nigeria. Therefore, the study recommended that foreign direct investment inflow is critical to reducing poverty. Therefore, foreign direct investment inflows should be enhanced to stimulate economic growth in Nigeria.

Keywords: Foreign Direct Investment (FDI), Poverty Level, FDI Inflows, FDI Outflows, Economic Growth, Granger Causality, ARDL Model, Nigeria, Cointegration, Poverty Reduction.

I. INTRODUCTION

Foreign direct investment has been identified as a catalyst for poverty reduction through its impact on knowledge and technology inflows, job creation, capital, and economic growth. Many scholars have considered the link between FDI and poverty to be indirect; this implies that FDI influences poverty reduction through its impact on critical factors (summers 2000, Kennedy, Bardy et al. 2012, Arogundade, Mduduzi et al. 2022). The classification of FDI as an integral component of growth suggests that FDI influence the inflow of best-practice requirements for growth. It is argued that, in a conducive business environment, FDI improves the quality of growth and contributes to poverty reduction. The FDI and poverty nexus is predicated on the absence of protection for domestic or foreign investors and the provision of a level playing field for competition (Klein, Aaron et al. 2001, Ucal 2014).

The neoclassical growth theory states that FDI increases a country's capital stock, thereby enabling higher growth. Also, endogenous growth theory postulates that economic growth is induced by technological innovation, which creates externalities that compensate for diminishing returns to capital. These benefits of foreign direct investment on growth include reducing poverty (Dhrifi, Jaziri et al. Numerous scholars have argued that the level of development of the domestic economy is vital in determining the extent to which it benefits from FDI. Absorptive capacity, the Institutional framework and human capital are considered the main domestic variables that condition the benefits of FDI on poverty (Meyer and Sinani, 2009).

In addition, FDI inflows are required in Nigeria to complement economic growth and reduce poverty incidence. According to World Development Indicators (WDI, 2018) and the International Monetary Fund (IMF, 2018), the trend of foreign direct investment in Nigeria shows some fluctuations and variations. FDI inflows into Nigeria reached an all-time high of 3.1 USD billion in December 2012, also the highest percentage of nominal GDP (2.5%) in that period. FDI inflows into Nigeria declined sharply to -1.5 USD billion in June 2022, the lowest share of nominal GDP (-1.4%) in the same period. This means that the FDI outflows exceeded the inflows by a large margin. FDI inflows in Nigeria recovered slightly to 752.7 USD million in December 2022, equivalent to -0.04% of nominal GDP. The FDI outflows as a percentage of GDP in Nigeria were generally low and stable,



ranging from -0.01% to 0.01% from 2010 to 2020. However, they increased significantly to -0.75% in 2021 and -0.79% in 2022, indicating that Nigerian investors were investing more abroad than foreign investors were investing in Nigeria (WDI, 2022).

The trend of FDI in Nigeria reflects the country's economic and political situation, as well as global and regional factors that shape the investment climate. Some possible reasons for the changes in FDI include: the high FDI inflows in 2012 were driven by strong growth in the oil and gas sector, which attracted large-scale investments from multinational companies¹. The negative FDI inflows in 2022 were driven by the COVID-19 pandemic, which disrupted economic activity and reduced investor confidence.

Given the incidence of poverty in Nigeria, the need arises to investigate how responsive poverty is to FDI inflows. Hence, studies conducted in the past have established a positive relationship between FDI and poverty reduction (Hung, 1999; Shamim et al., 2014; Bharadwaj, 2014; Uttama, 2015). Moreover, Baradwaj (2014), Huang et al. (2010), and Nishat and Ali (2010) found that FDI negatively influences poverty alleviation. Poverty in Nigeria is a serious and complex issue that affects millions of people. According to the World Bank, Nigeria's poverty rate was 90.8% in 2018, meaning that almost 9 out of 10 Nigerians lived on less than \$5.50 a day. The poverty rate is estimated to increase to 45% of the population, or 90 million people, in 2022. The World Bank also reports that Nigeria's poverty reduction is hindered by sluggish growth, low human capital, labour market weaknesses, and exposure to shocks.

This study is significant for policy, practice, and the literature. Poverty matters have been at the epicentre of government concern and the way to solve the problems associated with it. On the other hand, FDI, an indispensable ingredient of economic growth and development, deserves the utmost importance. The tripod level of significance can be put into context given the poverty that affects a significant number of people in Nigeria.

Further, in the realm of policies, the outcome of the study will provide input into the national, state and local government poverty alleviation programs and policies, as well as a good framework that can attract FDI into some neglected sectors of the economy and robust macroeconomic policies that can fairly fit with the modern trend of technology. This is achievable if the study suggests best practices for program design, process harmony and synchronised execution templates. The recommendation will be innovative compared with the multi-dimensional, loosely coordinated approaches that characterised the current corruption in poverty reduction programs.

II. CONCEPTUAL CLARIFICATION AND LITERATURE REVIEW

A) Concept of Foreign Direct Investment

From the economic literature, foreign direct investment is classified as defensive and expansionary *FDI*. Chen and Ku (2000) opined that when foreign investors seek labour that is relatively cheap in the host country to reduce production costs, it is regarded as defensive *FDI*. Expansionary *FDI*, on the other hand, enables the investor to exploit its firm-specific advantage in the host country, thereby contributing to the firm's overall sales growth and profitability.

Moreover, *FDI* provides a veritable channel for channelling resources from developed economies to developing countries. This is especially so in light of dwindling access to other sources of financing, especially following the emergence of the international debt crisis in the early 1980s. In fact, Asiedu (2002) asserted the critical role of *FDI* and its increasing significance as a reliable capital source for SSA. Besides providing capital, *FDI* is generally associated with the transfer of technology and the development of marketing, technical and managerial skills (Zangina & Hassan, 2020). That is why it has been argued that *FDI* plays a significant role in the growth dynamics of developing economies by filling at least three developmental gaps. These are the investment gap through investment capital; foreign exchange gap through investment and earnings from exports; and tax revenue gap from economic activities (Quazi, Vemuri & Soliman, 2014). These anticipated benefits from *FDI* are particularly relevant for capital-deficient SSA countries trying to overcome development challenges. Globalisation has facilitated the flow of capital investment worldwide, resulting in rapid growth in FDI and a shift in its distribution, especially since the 1980s. The role of *FDI* in economic growth and its growing significance in the development process of developing countries has motivated scholars to develop theories to explain its dynamics. The classifications of *FDI* from the host country perspective are broadly three: 'import-substituting *FDI*', 'export-increasing *FDI*' and 'government-initiated *FDI*'. When *FDI* enables the host country to produce goods that were hitherto imported, it is regarded as import-substituting *FDI*. In this regard, trade barriers, transportation costs and the size of the host-country market are considered likely determinants of this particular form of *FDI*. Conversely, export-increasing *FDI* leads to the export of raw materials and intermediate goods from the host country to the investor's home country and to other countries that host the subsidiaries of MNCs. The government-initiated *FDI* can be prompted by incentives offered by the host country's authorities to foreign investors to stimulate investment and resolve the balance of payments deficit.

B) Poverty

Being in a state of poverty means not being able to afford basic household essentials due to extremely low income. A variety of metrics are used to measure poverty. For instance, the Gini coefficient¹⁵ is used in studies by Tsagkanos (2017) and Sun et al. (2013) as a proxy for poverty. The poverty gap index from the World Development Indicators is used by Naceur and Zhang (2016) and Beck et al. (2004), whereas Dhrifi (2013) utilises household final consumption expenditure as a proxy for poverty reduction.

In accordance with the works of Dhrifi (2013) and Quartey, this study uses annual data on household consumption spending to estimate the decline of poverty (2005). For developing economies, data on the Gini coefficient and the Poverty Headcount are unreliable or not readily available. However, the World Development Indicators database has annual data on household consumption expenditures for all nations. It was revealed that using household consumption expenditure as a proxy for poverty reduction is more consistent and reliable (Sehrawat & Giri, 2016). Because poverty is one of the key elements influencing households, businesses, and economic development, this study uses the elimination of poverty as a potential predictor of stock market development.

C) Foreign Direct Investment and Poverty

The possibility of job creation is very high in a country with an influx of FDI (Adams et al., 2009). Barro et al. (2013) argued that firms in host economies invest heavily, resulting in high productivity and, in turn, development and economic growth. In addition, voluminous investment in real assets where firms operate also employs people and coaches them to labour in their founded, in so doing, assisting in reducing poverty levels. An increase in employment levels resulting from FDI can generate additional employment opportunities across sectors of the economy through the multiplier effect. Alfaro et al. (2007) argued that FDI, as reflected in actual improvements in employment, will enhance aggregate demand by exerting pressure on other economic units to raise output, thereby increasing demand for additional labour in those units as well. Thus, employment formation may lead to a reduction in poverty.

Consequently, the capacity of the receiving country to harness the major benefits of FDI in reducing poverty is highly determined by the level of advancement of how developed the host economy (Meyer & Sinani, 2009). The stage and rate of economic advancement play an imperative role in determining the capability of the receiving economy to equip the home firms and make them proficient in extracting the payback from the influx of FDI, thus having trained labour power, and the recipient countries' capacity to outline FDI procedures that can assist in alleviating poverty (Meyer & Sinani, 2009). The differences in stages of growth and levels of economic advancement led to wide disparities in the benefits derived from FDI between rich and poor economies (Kemeny, 2010; Meyer & Sinani, 2009). Low-income economies with increasing opportunities for social capabilities experience a visibly strong impact of FDI (Kemeny, 2010).

However, Aamir and Shahbaz (2008) maintained that the main crucial determinant of FDI effects on poverty reduction in a country is the capacity of the host economy to make available good and favourable conditions for economic and political activities in order to take advantage of the social payback from the FDI. The influence of FDI on human progress could be analysed from two viewpoints. On the social side, reducing poverty and improving well-being are major concerns of authorities in developing countries. FDI may be able to achieve these objectives by creating jobs from new investments, encouraging technological progress and enhancing local skills. From an economic viewpoint, the current literature, especially on endogenous growth, suggests that human capital could be the most important driver of self-sustaining growth in economic development and in GDP per capita, given that human development is the main contributor to human capital.

Smith and Todaro (2003) and Hayami (2001) argued that FDI can introduce improved technology, thereby facilitating ever-increasing productivity. Consequently, Mayne (1997) stated that FDI may help break the vicious circle of poverty and underdevelopment. The impact depended on the receiving country's macroeconomic policies, labour market quality, investment levels and the economic environment. Klein et al. (2001) argued that FDI could help raise economic growth by stabilising equity markets and may aid in curbing poverty by increasing access to finance for the active poor. Nevertheless, Saravanamtoo (1999) argued that when the rate of investment acceleration exceeds population growth, it can be a powerful tool for reducing poverty in a country. Seeing that, FDI is helping increase investment in the recipient country and, in turn, reduce poverty in the host country.

D) Empirical Review of Literature

In the literature, Dhrifi, Jaziri et al. (2020) examined the impact of FDI on carbon dioxide emissions and poverty in 98 developing countries from 1995 to 2017. The study utilised the ARDL method and the causality test; the evidence indicates a bidirectional relationship between FDI and poverty. The results show that FDI reduces poverty in the selected countries. Similarly, Bilal et al. (2019) used the ARDL technique and cointegration to analyse FDI and poverty in Pakistan from 1985 to 2016. Evidence indicates bidirectional causality between FDI and poverty; the results also show that FDI enhances poverty

reduction. Also, Magombeyi and Odhiambo (2018) followed a similar line of analysis by examining the effect of FDI on poverty reduction in Botswana from 1980 to 2014. Using the ARDL bounds test and the Error Correction Model, the study utilised three different proxies of poverty: life expectancy, the infant mortality rate and household consumption expenditure. Evidence indicates that FDI has a positive impact on poverty reduction in the short run and a negative impact in the long run.

While analysing the influence of human capital, FDI and institutional quality on poverty, Arogundade et al. (2022) utilised the FEM technique and heterogeneous Granger method for a panel of 30 Sub-Saharan African (SSA) economies from 1996 to 2018. Evidence indicates that FDI reduces poverty only when it interacts with human capital and institutional quality at a threshold. Also, results show that bidirectional causality exists between FDI and poverty. Similarly, Gohou and Soumaré (2012) examine the influence of FDI on poverty reduction in 52 African countries over the period 1990 to 2007. Using the GMM technique, the study developed a composite index for human capital development with principal component analysis. Evidence indicates a strong, positive association between FDI inflows and poverty reduction in Africa.

Hung (2005) analysed how FDI impacted growth and reduced poverty using panel data regression analysis of 12 Vietnamese cities and provinces from 1992 to 2002. His findings are in accord with those of Baradwaj (2014), confirming that FDI has direct and indirect effects and applying different categories of variables that need to be distinguished. In addition, Aaron (2005) reaffirmed Baradwaj's (2014) findings. Hung (1999) investigated the connection between FDI and poverty in two parts: first, examining how FDI inflows in different provinces affect their economic growth; and, second, examining the effects of FDI on poverty. In their investigation of the relationship between FDI and poverty reduction. Zaman et al. (2012) further classified economies into high- and low-FDI potential in Pakistan for the period 1985 - 2011. The results revealed a strong and significant effect of FDI on poverty, especially in regions with low FDI prospects. The study applied OLS using the poverty headcount as the poverty measure. The outcomes show that a one percentage point increase in FDI reduced poverty by 47 percent in cities, 44 percent among remote residents and 46 percent at the national level.

Jalilian and Weiss (2004) used an unbalanced panel of ASEAN countries to examine the influence of FDI on poverty in recipient countries for the period 1997–2007. The study used the take-home income of the lowest 20 percent of the population as a proxy for poverty. The study revealed that FDI is positively affecting the incomes of people experiencing poverty. Calvo and Hernandez (2006), using panel data, analysed the influence of FDI on poverty for the period 1984 – 1998. The study uses proxies for poverty, such as the poverty gap and the poverty headcount. The results of the study indicated that the benefits of FDI vary depending on the direction of the foreign auxiliary, as well as the initial local conditions on which the FDI was based. The results also show that FDI reduces poverty on average, and doubling foreign capital results in a 5.3 percent decline in the poverty headcount.

Soumaré and Gohou (2012) examined the influence of FDI on economic growth and poverty across African countries using econometric models. Panel data were used. The contribution of FDI to poverty reduction was examined, along with possible disparities in its contribution to African regional poverty reduction. Specifically, the variables used are carefully selected, including the ratio of FDI net inflow to gross capital formation, without including variables such as GDP and FDI solely to achieve the targeted detailed results, as they claimed. The study also replaced GDP with the Human Development Index to investigate its effects on welfare. The study found bidirectional causality between FDI and GDP per capita and concluded that FDI leads to poverty reduction and improved welfare. Furthermore, they stated that the positive consequence of FDI on welfare varies substantially across regions of Africa. The results show that FDI positively affects welfare in the Eastern and Central Africa regions, but the impact in the Southern and Northern regions of Africa is insignificant.

In contrast to the above finding, Ucal (2014) used samples of 26 developing economies to investigate the consequence of FDI on poverty, using an unequal panel. The analysis was conducted for the period 1990 - 2009. The study reveals an inverse relationship between FDI and poverty in selected developing economies. This confirmed that FDI plays a vital role in poverty reduction in the selected economies. In another study, Huang et al. (2010) assessed the effect on poverty in 12 Eastern Latin American countries for the period 1970 - 2005. The study used unbalanced panel data, and the proxy for poverty was the average take-home income of the poor population. The results show that FDI inflows have an inverse effect on poverty. Nishat and Ali (2010) used time series data from Pakistan for the period 1973 - 2008 to investigate the effect of FDI on poverty. The study employed an ARDL model and measured poverty using the headcount index as a proxy. The results show that FDI inflows have an inverse impact on poverty, thereby reducing poverty in Pakistan in the short and long term.

Several studies have found that FDI has an insignificant impact on poverty reduction. These categories of studies consist of Ogunniyi and Igberi (2014), Akinmulegun (2012), Gohou and Soumaré (2012), Tsai and Huang (2007) and Tsai and Huang (2007) analysed the consequence of influx of FDI on poverty in Taiwan, for the period 1964 - 2003, using time series data. The research used average income-based quintiles as a proxy for poverty. The results show that FDI inflows have no significant effect on the mean income of people with low incomes. Applying VAR to time-series data for Nigeria, Akinmulegun (2012) studied

the effects of FDI on the country's welfare for the period 1986 - 2009. The results indicate that FDI inflows have an insignificant effect on the welfare of Nigerians. The result is in accord and consistent with a separate study conducted in Nigeria for the period 1980 - 2012 by Ogunniyi and Igberi (2014).

Finally, Ogunniyi and Igberi (2014) applied OLS to time-series data from Nigeria for the period 1980–2012 to investigate the influence of FDI on poverty reduction in the country. The study employed per capita GDP as a measure of poverty. The results show that FDI has an insignificant effect on poverty in the country during the period of study. Similarly, in their investigation of the impact of FDI on poverty reduction, Gohou and Soumaré (2012) used panel data from 52 African countries for the period 1990 - 2007. The study utilised the Human Development Index and GDP per capita as proxies for poverty. In the panel data, the study attempted to control for endogeneity by using 2-stage least squares. The result reveals that the influence of FDI on poverty cut-back is irrelevant in Northern regions and the Southern provinces of Africa.

Besides, studies by other scholars on FDI and poverty yield inconsistent results, which may be due to differences in methodologies or sampling methods. Therefore, the results of one country cannot be generalised to another because of differences in economic factors. In Nigeria, less concern is given to FDI and poverty. Therefore, this study is expected to investigate the direction of the causal association among the variables, aiming to fill this gap. To our knowledge, few studies in Nigeria have considered these variables. Based on this, the effect of inward and outward FDI on poverty remains to be examined. Disaggregating FDI into inward and outward investment is an important area that needs further exploration.

FDI is a crucial component of global economic integration; understanding the specific dynamics of inward and outward investments can provide valuable insights for policymakers, researchers, and investors. One significant reason for disaggregating FDI into inward and outward flows is to gain a comprehensive understanding of the drivers and impacts of FDI. By examining inward investments, researchers can identify the factors that attract foreign investors to a particular country. This analysis can shed light on the host country's competitiveness, investment climate, and potential areas for improvement. Additionally, understanding the motivations and strategies behind outward investments can provide insights into the home country's economic development, competitiveness, and global business strategies. Analysing the disaggregated data on inward and outward investments can provide valuable insights into the spillover effects of FDI. Inward investments have the potential to generate positive spillovers, such as technology transfer, knowledge diffusion, and productivity improvements, which can benefit the host country's domestic firms. By understanding the sectors and industries that attract inward investments, policymakers can design policies to minimise any potential negative effects.

Similarly, studying outward investments can help identify the spillover effects on the home country's economy, such as knowledge and skill development. The lack of disaggregation of FDI into inward and outward investments is an important area that warrants further exploration. Understanding the drivers, impacts and spillover effects of inward and outward investments can provide valuable insights for policymakers, researchers, and investors. By analysing the specific dynamics of inward and outward investment, policymakers can design targeted policies to attract and retain foreign investors, promote domestic firms' internationalisation, and maximise the positive spillovers of FDI.

III. DATA SOURCE AND METHODOLOGY

This section presents the models that will be used for stating the objectives of the study. The aim is to guide and help achieve the set objectives. The study limits its scope to the relationship between FDI and poverty in Nigeria. The study uses secondary data on poverty (POV), foreign direct investment (FDI), labour force total (L) as a control variable, and capital stock (K) as a control variable. These enable the study to focus on a particular aspect of the issue. The data for these variables are collected from the World Development Indicators (WDI). Therefore, the study covers the period of 39 years (1984 – 2022). The availability of data for each variable influences the selected time period. The study aims to empirically assess the nexus between foreign direct investment and poverty in Nigeria. Therefore, the study employs the following equation:

$$POV = F(K, L, FDI_INFLOW, FDI_OUTFLOW) \quad (1)$$

Where K denotes gross capital formation, L is the labour force total, FDI_INFLOW represents a foreign direct investment net inflow to Nigeria, and FDI_OUTFLOW represents a foreign direct investment net outflow from Nigeria. Therefore, the econometric specification of the equation is written as:

$$POV_t = \beta_0 + \beta_1 K_t + \beta_2 L_t + \beta_3 FDI_INFLOW_t + \beta_4 FDI_OUTFLOW_t + \varepsilon_t \quad (2)$$

Where β_0 Moreover, β represents coefficients, t stands for a time span, and ε indicates the error term.

To conduct the analysis, the ARDL bounds testing method is used to test for the existence of a long-run relationship among the variables. Pesaran and Shin (1999) introduced the ARDL bounds modelling technique, which was later extended by Pesaran, Shin, and Smith (2001). The ARDL bounds cointegration method has many benefits compared with other cointegration procedures. For instance, the assumption that all variables are integrated of the same order in the ARDL bounds test is not

required, unlike other cointegration techniques. Thus, the ARDL method can be employed regardless of whether the variables are integrated of order zero or order one. Secondly, the ARDL test is appropriate for even small samples, whereas other cointegration tests are sensitive to sample size. Finally, the ARDL method proposes an unbiased long-run model and valid t-statistic estimates even when some of the variables are endogenous (Harris & Sollis, 2003).

Scholars have been using ARDL techniques for a long time. Nevertheless, it provides an esteemed means of analysing long-term interactions among economic time series. The method was recently improved by Pesaran and Shin (1999) and further extended by Pesaran, Shin, and Smith (2001) and Narayan (2005). One of the benefits of ARDL techniques is that, regardless of the degree of integration of the sequence, they provide robust results even with small sample sizes and reliable estimates of the long-run coefficients (Pesaran & Shin, 1999). ARDL model is represented in equation [3.14]

$$\Delta Y_t = \beta_0 + \beta_1 \Delta Y_{t-1} + \beta_2 \Delta Y_{t-2} + \dots + \beta_n \Delta Y_{t-k} + \gamma_1 Y_{t-1} + \gamma_2 Y_{t-2} + \dots + \gamma_n Y_{t-k} + \varepsilon_t \quad [3]$$

Where ε_t stands for the white noise error term, and the model is autoregressive; hence Y_t represents a vector of the variables employed in the model. The ΔY_t can be explained (in part) by change and lagged values of itself. It also has a distributed lag component, in the form of successive lags of the other independent variable. However, these methods are considered weak because they do not yield robust results for small samples, structural shocks, or breaks.

IV. RESULTS AND DISCUSSION

A) Unit root test for Stationary

To achieve a meaningful regression with time-series data, it is necessary to test for unit roots in the variables. The variables used in the analysis need to be stationary and/or cointegrated to infer a meaningful relationship from the regression. The unit root test provides the order of integration at which the variables can be stationary. The tests were performed on all series (POV_GAP, FDI_INFLOW, FDI_OUTFLOW, LABOUR, and K) using the Augmented Dickey-Fuller Unit Root Test. The results of the Phillips-Perron unit root tests are presented in Table 1 as follows:

Table 1: Augmented Dickey-Fuller Unit Root Test

Variable	Level	First Difference	Order of Integration
	t-Stat	t-Stat	0 or I
POV	-0.0519	-3.6851***	I(1)
FDI_INFLOW	-3.7789**	-3.7789***	I(0)
FDI_OUTFLOW	-4.0433***	-9.4470***	I(0)
LABOUR	2.3515	-2.8850*	I(1)
K	1.7054	-4.1343***	I(1)

Source: Author's computation, 2026.

Note: denotes the level of significance at 1%, 5% & 10% respectively.

Based on the unit root test result presented in Table 1, FDI_INFLOW and FDI_OUTFLOW variables are stationary at levels, whereas the variables of GDP, POV, LABOUR, and K were found to be stationary at first difference I(1).

B) The Optimal ARDL Model

Based on the unit root results, which indicate that the series are integrated at both level and first difference. These imply that the model has an amalgamated order of integration, suggesting the use of the ARDL Bound approach. The appropriate lag selection for the dependent and independent variables is to be determined first. The optimal lag selection based on the ARDL Bound method is automatically determined using the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC), as shown in Table 2.

Table 2: Selected Model: ARDL (1, 1, 0, 0, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
POV(-1)	0.853356	0.046261	18.44657	0.0000
LOGK	0.029355	0.023456	1.251513	0.2228
LOGK(-1)	0.041503	0.023399	1.773680	0.0888
LOGLABOUR	-0.093789	0.025093	-3.737697	0.0010
FDIIN GDP	0.004515	0.002244	2.011882	0.0556
FDIOUT	-0.004389	0.006468	-0.678488	0.5040
FDIOUT(-1)	-0.004685	0.004864	-0.963107	0.3451
FDIOUT(-2)	0.009247	0.004987	1.854299	0.0760
C	-0.078533	0.480826	-0.163330	0.8716
R-squared	0.978569	Mean dependent var		0.247393
Adjusted R-squared	0.971426	S.D. of dependent var		0.062391

S.E. of regression	0.010547	Akaike info criterion	-6.039017
Sum squared resid	0.002670	Schwarz criterion	-5.630878
Log likelihood	108.6438	Hannan-Quinn criterion	-5.901690
F-statistic	136.9850	Durbin-Watson stat	1.552103
Prob(F-statistic)	0.000000		

Source: Authors' computation, 2026.

Note: p-values and any subsequent tests do not account for model

C) The ARDL Bounds Test

As observed in Table 2, the unit root estimation results for the variables in Model 1 indicate that the variables are integrated of different orders, i.e., stationary at the level and in first differences, $I(0)$ and $I(1)$. Based on the unit root results, the study utilised the ARDL Bound test in an attempt to explore the likelihood of the presence or otherwise of a long-run association between the variables. Having utilised the ARDL Bound technique, the cointegration test does not apply. Based on the Bound test results in Table 4.9, the F-statistic estimate value is compared with the upper Bound value at a 5% critical level. The result indicates the presence of a long-run association within the model.

Table 3: ARDL Bounds Test

Test Statistics	Value	K	Significance	I ₀	I ₁
F-Statistics	4.610569	4	10%	2.45	3.52
			5%	2.86	4.01
			2.5%	3.25	4.49
			1%	3.74	5.06

Source: Authors' computation, 2026.

D) The Long-Run Estimates

Based on the results of the Bound test, which indicate that the variables are cointegrated, as observed in Table 4. Below are the long-run coefficient results of the ARDL method presented in Table 4.

Table 4: The ARDL Long Run Cointegration

Variable	Coefficient	Std. Error	t-Statistic	Prob.
logK	0.483196	0.262451	1.841091	0.0780
logLABOUR	-0.639569	0.212270	-3.013001	0.0060
FDI INFLOW	-0.030792	0.015372	-2.003097	0.0566
FDI OUTFLOW	0.001184	0.053165	0.022263	0.9824
C	-0.535537	3.311682	-0.161712	0.8729

Source: Authors' computation, 2026

Note: And denote the level of significance at one percent and five percent, respectively.

The estimation results for capital stock indicate a positive and significant coefficient at the 10 percent level of significance. This means a unit increase in capital stock results in a 4.48 percent increase in poverty in Nigeria. This implies that rising capital increases poverty in Nigeria in the long run. This result contradicts the established theory. This can be due to the inadequate capital in Nigeria.

The results on labour reveal a significant coefficient of 5 percent and a negative coefficient. These imply that a one percent increase in labour leads to a -0.63 percent decrease in poverty in Nigeria in the long run. This means that labour influences poverty negatively in Nigeria. This means that when labour is high, the economy will experience a reduction in poverty.

The FDI_INFLOW estimation results indicate a significant negative coefficient at the 5 percent level of significance. This means that a one percent increase in FDI_INFLOW results in -0.03 decrease in poverty in Nigeria. This implies that FDI_INFLOW reduces poverty in Nigeria in the long run. This implies that FDI_INFLOW reduces poverty in Nigeria in the long run. This finding is consistent with studies by Gohou and Soumaré (2010), Dollar and Kraay (2001), Rama (2001), Kolstad and Tondel (2002), and Chowdhury and Mavrotas (2006), which demonstrate that FDI indeed alleviates poverty. The result of FDI_OUTFLOW indicates a positive, however, insignificant coefficient at all levels (1%, 5% & 10%). This means that FDI_OUTFLOW does not influence poverty in Nigeria.

E) The ARDL Short Run

The short-run estimation coefficients are depicted in Table 5. The short-run estimation presents the model's convergence to the equilibrium position. The conditions for the convergence of ECT to the equilibrium are that the cointegration equation coefficient must be less than one, negative and significant. As observed, the ECT coefficient is significant, negative, and less than one. These imply that the speed of adjustment for Nigeria back to the equilibrium position is 63%.

Table 5: ARDL Short Run Cointegration

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(logLABOR)	-1.866400	1.489338	-1.253175	0.2322
D(logLABOR(-1))	0.387748	1.338257	0.289741	0.7766
D(logLABOR(-2))	-2.824042	0.875952	-3.223969	0.0067
D(logFDIOUT CUR)	0.010934	0.025744	0.424730	0.6780
sD(logFDIOUT CUR(-1))	0.044066	0.022587	1.950909	0.0730
D(logFDIOUT CUR(-2))	0.029507	0.021101	1.398324	0.1854
D(K)	-0.009102	0.008309	-1.095447	0.2932
D(K(-1))	-0.006059	0.011872	-0.510382	0.6183
D(K(-2))	0.029247	0.010984	2.662751	0.0195
D(FDIIN GDP)	0.027207	0.021535	1.263406	0.2286
D(FDIIN GDP(-1))	-0.016890	0.021999	-0.767756	0.4564
D(FDIIN GDP(-2))	-0.062510	0.019595	-3.190060	0.0071
CointEq(-1)	-0.635227	0.123992	-5.123148	0.0002

Source: Authors' computation, 2026.

Note: And denote the level of significance at one percent, five percent, and ten percent, respectively.

As observed in Table 5. In the short run, the labour coefficient is negative and significant at lag 2. This means that a one percent increase in labour leads to a -2.82 percent change in the short run. This implies that labour reduces poverty. The FDI_OUTFLOW estimation results indicate a positive and significant coefficient at the 10 percent significance level. This means that a one percent increase in FDI_OUTFLOW level results in a 0.04 percent increase in poverty in Nigeria in the short run. This implies that FDI net outflow enhances poverty. The estimation results for capital stock indicate a positive and significant coefficient at the 5 percent significance level. This means that a one percent increase in capital stock leads to a 0.02 percent increase in poverty in Nigeria in the short run. The result on FDI_INFLOW indicates a negative and positive coefficient at lag 2. This means that a one percent increase in FDI_INFLOW leads to -0.06 percent decrease in economic growth in Nigeria in the short run. The cointegration equation indicates the speed at which the economy can recover to the equilibrium position. The coefficient indicates that the economy will recover at a 63% speed of adjustment to the equilibrium position.

F) Diagnostic Checking

The study conducts various post-estimation diagnostic checks to prove the authenticity of the estimation results above. The study employed the Breusch-Godfrey LM test for autocorrelation to check for serial correlation in the series, and the Breusch-Pagan test for heteroskedasticity to determine whether the model is homoscedastic or heteroskedastic.

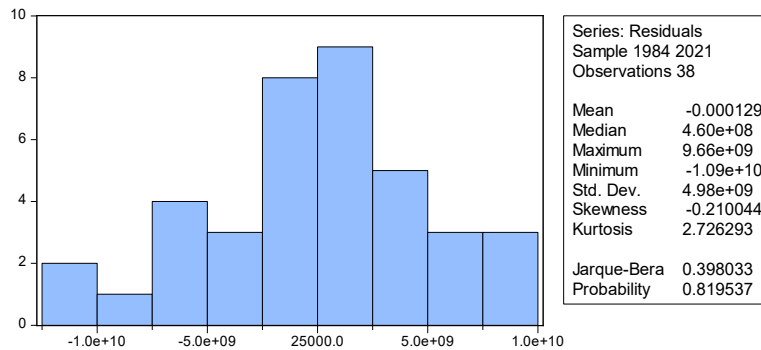
Table 6: Diagnostic Tests

Test	F-statistic	Chi-square	Probability
Breusch-Godfrey LM Test	1.295356		0.2923
sBreusch-Pagan	0.647500		0.5330
Jarque-Bera			0.428

Source: Authors' computation, 2026.

Note: And denote the level of significance at one, five, and ten percent, respectively.

As shown in Table 6, the Breusch-Godfrey LM test indicates that the series is free of serial correlation, with a p-value of 0.2923. Furthermore, the model is free of heteroskedasticity, with an insignificant p-value of 0.5330. Moreover, the series is normally distributed, as indicated by an insignificant Jarque-Bera test statistic of 0.3980.

**Figure 1. Histogram of Residuals with Normality Test Statistics**

G) Stability Test of the Model

The study assesses the model's stability using the CUSUM and CUSUMSQ tests. The CUSUM stability line should lie within the line bounds; then we say the model is stable at the 5 percent level.

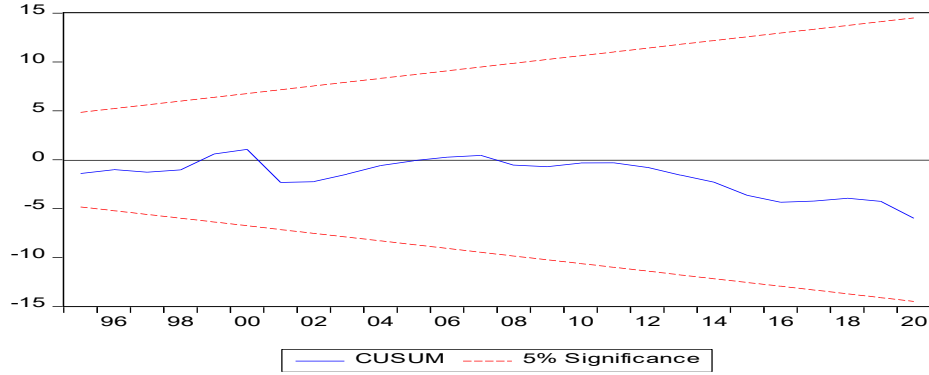


Figure 2. CUSUM Stability Test Graph

Source: Computer output using E-Views 10

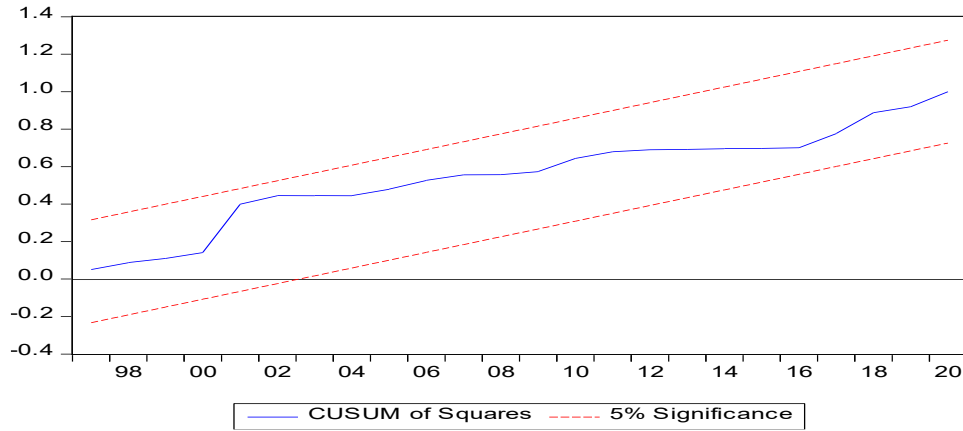


Figure 3. CUSUM Squared Stability Test Graph

Source: Computer output using E-Views 10

H) Causal Relationship between Foreign Direct Investment and Poverty.

The study utilised error correction models based on the Granger Causality Test to explore the causal association between the variables.

Table 6: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob
LOGGDPPER CUR does not Granger-cause FDIIN GDP	36	2.45451	0.0831
FDIIN GDP does not Granger-cause LOGGDPPER CUR		2.52304	0.0773
POV GAP does not Granger-cause LOGFDI	32	0.33023	0.8035
LOGFDI does not Granger-cause POV GAP		2.33231	0.0984

Source: Authors' computation, 2026.

The Granger causality test results indicate that a two-way causal relationship exists: poverty Granger-causes foreign direct investment, and foreign direct investment Granger-causes poverty. This implies a bidirectional causality.

The study's results have provided important insights. The results indicate that inward foreign direct investment reduces the poverty rate in Nigeria. The evidence is consistent with the conclusion that as more FDI flows into an economy, more jobs are created and hence less unemployment. The study supports the findings of Arogundade et al. (2022), Gohou and Soumaré (2012), Bilal et al. (2019), and Dhrihi, Jaziri et al. (2020), who found that foreign direct investment reduces poverty.

V. CONCLUSION

To analyse the impact of foreign direct investment on poverty in Nigeria. The study utilised the panel Autoregressive Distributed Lag (ARDL) model, which is robust to autocorrelation and heteroscedasticity. The study employed econometric

analytical techniques including descriptive statistics and matrix correlation of variables. The findings indicate that foreign direct investment inflows reduce poverty in Nigeria in the long run. This implies that inflows of capital from other countries into Nigeria positively affect the Nigerian economy. Similarly, the estimation results indicate that foreign direct investment outflows are unrelated to poverty. Thirdly, the study analysed the causal relationship between foreign direct investment, poverty, and economic growth in Nigeria. Evidence shows that economic growth Granger-causes FDI, and FDI Granger-causes economic growth. In conclusion, the study examined the impact of foreign direct investment on Nigeria's economic growth. The study also investigates the impact of foreign direct investment on poverty in Nigeria. The study examined foreign direct investment, both inward and outward, in Nigeria and its impact on growth and poverty. The section has provided a summary of the findings, policy implications, limitations and recommendations for future study.

Recommendations

The findings indicate that foreign direct investment inflows have a greater influence on the poverty rate in Nigeria. Also, foreign direct investment inflows reduce poverty. However, foreign direct investment outflows negatively affect economic growth in Nigeria.

The outcome reveals that foreign direct investment inflow is critical to improving economic growth in Nigeria. Therefore, foreign direct investment inflows should be enhanced to stimulate economic growth in Nigeria.

- Foreign direct investment outflows should be discouraged to enhance economic growth in Nigeria.
- The outcome shows that foreign direct investment inflows are critical to reducing poverty. Therefore, foreign direct investment inflows should be enhanced to stimulate economic growth in Nigeria.

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