

# Foreign Direct Investment and Poverty Reduction in Nigeria: Implication for Sustainable Development

## ABSTRACT

The study examined the impact of Foreign Direct Investment on poverty reduction with implication on Sustainable development in Nigeria using Autoregressive Distributed Lag (ARDL) model technique on times series data collected from 1985 to 2020. Unit root test using Augmented Dickey-Fuller (ADF) found that Poverty Head Count Ratio (PHCR), Gross fixed capital formation (GFCF) and Real Exchange rate (REXR) are integrated of order 1(1) while Foreign Direct Investment (FDI) is integrated of order 1(0). The results show that FDI has a negative impact on poverty reduction in Nigeria and ARDL Bounds test result shows that there is a long run relationship among all the variables. Finally, lag value result indicates that gross fixed capital formation has a significant impact on poverty head count ratio in Nigeria. In view of these findings, the study concluded and recommended that FDI policies must be checked closely in order to make FDI growth enhancing in Nigeria so as to achieve Sustainable Development Goals (SDGs) one. Government should also encourage gross fixed capital formation to reduce poverty in Nigeria.

**Keywords:** ARDL, Foreign Direct Investment, Gross Fiscal Capital Formation, Poverty Reduction, SDGs

**JEL Classification:** F2; 047; C100

## 1. INTRODUCTION

Poverty is a multidimensional worldwide problem that impacts every country on planet in one way or the other and at varying degrees of severity. It is currently seen as the biggest danger to peace and stability, surpassing terrorism and other widely-publicized conflicts (Oloyede, 2014 as cited in Anigbogu, Edoko & Okoli, 2016). According to the United Nations Development Project (UNDP), 93 percent of the one billion people who lived in extreme poverty in 2010 lived in three regions: East Asia, South Asia, and Sub-Saharan Africa. Additionally, eight million people per year pass away from inability to pay for their own survival. In the recent past, poverty is a serious problem confronting Nigeria, and the evidence that is now available indicates that poverty is endemic in Nigeria to the point where the majority of its citizens cannot afford basic necessities of life like good education, food, and a host of other things (World Poverty Clock, 2018; Adebayo, 2018; Aderemi et al., 2020:a). Nigeria's poverty statistics show that

it is one of the world's poorest nations. Prior to the Covid-19 crisis, almost 4 out of 10 Nigerians lived in poverty, and millions more were in danger of doing so because of the country's slow and uneven growth.

According to the National Bureau of Statistics, in 2018–19, over 39.1% of Nigerians were living below the \$1.90 per person per day (2011PPP) worldwide poverty line. A further 31.9 percent of Nigerians had daily expenditures between \$1.90 and \$3.20, putting them at danger of falling into extreme poverty in the case of a shock. Nigeria has struggled to produce the widespread development required to fight poverty because of a continued reliance on oil, a rapid rate of population expansion, and insufficient job creation (World Bank Group,2021). “Additional 31.9 percent of Nigerian had daily consumption levels between \$1.90 and\$3.20, putting them at risk of sliding into extreme poverty in the event of a shock. Nigeria has struggled to generate the broad-based development needed to combat poverty due to persistent oil dependence, a high population growth rate and inadequate job creation” (World Bank Group,2021).

Nigeria's poverty rate has risen steadily in recent decades. Nigeria, for instance, had an increase in poverty from 28.1 percent in 1980 to 46.3 percent in 1985. It was 42.7 percent in1992, but it soared to 65.6 percent in 1996 before plummeting to 54.4 percent in 2004. Between 2004 and2010, an estimated 160 million individuals (160 million) were reported to be impoverished, with roughly 120 million of them being children. Additionally, the poverty rate was 39.1% in 2018 and 40% in 2020, (NBS,2020). Together with the promotion of the sustainable development goal one, which is the reduction of poverty, fighting poverty in Nigeria has evolved into a continual task. While this is happening, it is necessary to find effective ways to close the investment gap in an economy like Nigeria where actual savings and investments are unable to transform into desired investments. Opening up the economy to foreign direct investment is one practical way to close the investment gap caused by insufficient locally mobilized savings and net export revenues (Adeola, 2017; Abidemi, Adegboye, Ogbemor & Egharvba,2014).

Foreign Direct Investment (FDI) in Nigeria is an investment made by a company that is entirely or partially controlled by a foreign company.The Foreign Exchange (Monitoring and Miscellaneous Provision) Decree, also adopted in 1995, and the Investment Code, which established the Nigerian Investment Promotion Commission (NIPC)(Decree No.16 of 1995), provide complete support for FDI in Nigeria. Nigeria has a great potential for attracting large amounts of international private investment. Because of its well-known benefits as a tool for economic development, most governments attempt to attract FDI. As indicated by the development of the New Partnership for Africa's Development (NEPAD) which has the attraction of foreign investment to Africa as a prominent component, Africa and Nigeria in particular have joined the rest of the globe in seeking FDI. In both developed and developing countries, FDI has a

direct impact on host economies (Louis Kouamé Caningan, 2012). Indeed, FDI may generate technology spin-offs, contribute to the development of human capital, promote integration into international trade, and foster the construction of a more competitive business climate, all while working in tandem with local businesses to help them grow. FDI can assist host countries improve their environmental and social situations (Demery, 2003). Aside from positive effects, FDI can also have some negative consequences, which primarily affect the costs borne by the host countries and are generally manifested by worsening of the balance of payments due to profit repatriation (Ikiara, 2003). Many different categories have been used to categorize foreign direct investment. Policymakers claim that it has a favorable effect on the economies of the hosts. When FDI is carried out in high-risk industries or new markets, economic rents are accrued to antiquated technologies and conventional management techniques. The receiver's economy will benefit greatly from these. Additionally, FDI helps close the capital gap and supplement local investment, especially when it goes to high-risk sectors of new firms where there are a lack of domestic resources. Foreign direct investment (FDI) is beginning to migrate away from manufacturing and toward services, which are becoming more conventional. Opportunities for employment creation, the transfer of infrastructure and technology, increased productivity, etc. have all been made possible by FDI. FDI enhances domestic investment by providing much-needed financial capital, transfer of valuable technology and knowledge through its externalities.

Since 1981, Nigeria has been in a state of stagnation and relative decline, with per capita GDP falling from US\$1,200 in 1981 to around US\$300 in 2000. The majority of the population lives in rural areas, and Nigeria is renowned as the world's poverty capital. In 1992, 34.1% of the population lived in poverty; by 2000, the number had increased to almost 70% and was still rising. Because of inflation, rising food prices, and growing transportation costs, the quality of life for many Nigerians has declined rather than improved; the typical worker's compensation of N36,000 (about \$72 USD), the national minimum wage, is insufficient to support a family. The projected monthly budget for the federal government is far below what is needed to pay for housing, food, education, health care, and transportation. Water and power are sporadically available in large cities. The government-subsidized electricity services are scarce, and the water supplies of many rural villages are contaminated with worms that spread disease. The nation suffers from excessive poverty, which has caused a "brain drain" to other regions of the world. Government mismanagement and corruption squandered the nation's wealth, while access to sufficient shelter, water and sanitation facilities, as well as communication, was extremely limited, and income disparity deteriorated during the same period. Individuals with minimal or no formal education, large families, farm communities and groups engaged in informal sector activities have been disproportionately affected by the worsening situation in rural areas.

Federal government of Nigeria had mapped out some measures to tackle poverty, such as: National Directorate of Employment (NDE), National Agricultural Land Development Authority (NALDA), Family

Economic Advancement Programs (FEAP), National Poverty eradication Program (NAPEP), Directorate of Food, Roads and Rural Infrastructure (DFRRI), National Board for Community Banks (NBCB), Better Life Program for Rural women (BLP), Nigerian Agricultural and Cooperative Bank (NACB), Peoples Bank of Nigeria (PBN), YOUWIN and lately N-Power. Poverty persists despite government efforts to eradicate it through campaigns, national development programs, and seasonal papers. The paradox of rising poverty in Nigeria even as its economy expanded and foreign direct investment (FDI) poured into the nation continues to exist. The connection between foreign direct investment and poverty reduction in Nigeria has been the subject of empirical investigation. However, the majority of these research, including Ogunniyi and Igberu (2014) and Adigun et al. (2021), used OLS estimation approaches, which are insufficient for producing reliable and consistent coefficient estimates for the study variables, leaving a gap in the methodology. The more sophisticated ARDL approach, which enables a more reliable co-integration and works well with small sample numbers, was used in this article. This approach makes it methodologically possible to deal with model selection, estimate, and inference, as well as to ascertain the short- and long-term effects of foreign direct investment on the decrease of poverty in Nigeria. The ARDL technique also makes a prediction about how quickly the economy will change after a shock to go back on its long-term equilibrium growth path. Additionally, most empirical studies choose their control variables at random, highlighting their flaw by excluding the majority of the crucial factors listed in the literature. For example, Omorogbe (2007) used GDP per capita while Gohou and Soumare (2012) used HDI as a proxy to measure poverty. This paper will employ poverty head count ratio as a proxy to measure poverty. This is to help overcome variable omission bias and guide against the identified gap in variables used from previous studies. The broad objective of this study is to determine the impact between Foreign direct investment and Poverty reduction in Nigeria with implication on sustainable development. The paper is divided into five parts, introduction, literature review, research methodology, results and discussion while the last part deals with policy implication, conclusion and recommendations.

### **1.1 Research Objectives**

1. To examine the impact of the selected macroeconomic variables like Foreign direct investment, Gross fixed capital formation and Real Exchange rate on poverty reduction in Nigeria.

### **1.2 Contribution to Knowledge**

Most literature that studied the impact of foreign direct investment on poverty reduction such as Okpe and Abu (2009) and Gohou and Soumare (2012) found that foreign direct investment have positive and significant impact on poverty reduction in Nigeria. This study will add to literature as it tries to have a deeper insight on the impact of foreign direct investment on poverty reduction using ARDL and also using poverty head count ratio which is an important variable to measure poverty which were not used in the previous studies. These will show whether foreign direct investment through gross fixed formation and real exchange rate has any impact in reducing poverty in Nigeria.

## **2. LITERATURE REVIEW**

Foreign Direct Investment and poverty have inspired a lot of theoretical and empirical effort. This section examines the review of some related literature on FDI and poverty reduction in Nigeria.

### **2.1 Conceptual Literature**

#### **Foreign Direct Investment (FDI)**

Babasanya (2018) defined foreign direct investment as an investment into the production of goods and services made by a citizen of a different nation, whether through the purchase of a firm or the expansion of an existing company abroad. Foreign Direct Investments, according to Todaro and Smith (2003), are investments made abroad by private multinational firms. Opening a subsidiary, purchasing an existing foreign company, merging with or forming a joint venture with a foreign company are all examples of foreign direct investment (Aladelusi & Olayiwola, 2021). Particularly for a growing country like Nigeria, foreign exchange and technological transfer can be obtained through foreign direct investment (Akubueze, 2020). Foreign direct investment (FDI), according to the United Nations, is money invested in a company that is physically situated in one nation but is actually run by citizens of another (UNCTAD, 2009 cited in Akubueze, 2020). According to Ogunniyi and Igberi (2014), FDI contributes to domestic savings and is frequently accompanied by technology and managerial skills, which are essential for economic development, helping to reduce poverty. According to Okafor (2019), foreign direct investment (FDI) is a global issue in which a resident of the domestic country seeks a long-term influence over the ownership of a subsidiary firm in the destination country. This definition has gained widespread acceptance because it was developed by the IMF and OECD in 2011 to serve as a foundation for the domestic department of statistics, charged with the responsibility of gathering FDI statistics.

#### **Poverty**

Poverty, according to the World Bank, is measured by the number of persons who make less than US\$1.90 per day. When a person is in poverty, they are unable to meet their fundamental needs, including those for food, shelter, clothes, and education. According to Oloyede (2014), the problem of poverty is a worldwide phenomena that has a wide range of effects on different countries. He said that poverty is a state that occurs when a person lacks the necessities of life. Omoniyi (2013) claims that there are three ways to account for poverty. The first is extreme poverty, which means the household is unable to provide for its most basic necessities. People lack access to essential services including housing, education, healthcare, and pipe-borne water here, and they are constantly hungry. On the other hand, moderate poverty describes a way of living where the bare necessities are barely met. A household income level below a specified percentage of the average national income is said to be in relative poverty.

According to Oke and Olayemi (2014), the issue of poverty is concerning because, despite the significant financial and human resources that governments have dedicated to reducing it, little visible progress has been made in this area. According to data from the World Development Indicators (WDI, 2021), Nigeria's Human Development Index (HDI) has not increased from 0.55 for several years, indicating a low level of human capital development. This demonstrates that Nigeria is one of the world's poorest nations. The poverty head count ratio for Nigeria is 40.1 as at 2021 which shows that about 40% of Nigeria's population live below the poverty line.

## **2.2 Review of Basic Theories**

### **a) Endogenous Growth Theory**

The endogenous growth theory explains the relationship between FDI and poverty. According to the notion, economic growth and increased productivity will reduce poverty and improve wellbeing. The proponents of this viewpoint contend that, especially in nations with minimal income disparity, an increase in national income tends to benefit the most vulnerable population (Koopmans, 1965; Lucas, 1988; Solow, 1956). Meyer (2004) contends that in addition to the conventional growth theories, FDI can have two types of effects on poverty: vertical and horizontal. The technological transfer from overseas enterprises to local firms has a horizontal spillover effect (Farole & Winkler, 2012).

According to Görg and Greenaway (2004) and Meyer, 2004, the knowledge impact occurs as a result of labor migration and domestic businesses imitating foreign companies' product innovations. Employing local labor and educating the workforce also contributes to the horizontal spillover (Calvo & Hernandez, 2006; Meyer, 2004). The level of human capital and the wellbeing of the workforce in the host countries both improve as a result. The welfare of the labor force is impacted by the improvement in human capital in two ways. First of all, it raises the level of human capital available to the local labor force. Second, the employees receive competitive pay (Borensztein et al., 1998). According to Meyer (2004), the interaction between foreign businesses and local economic agents leads to the vertical spillover.

### **b) Theory of Eclectic Paradigm**

This paper adopts John Dunning's theory of the eclectic paradigm developed in 1993. The theory includes the three primary FDI assumptions that are important: ownership-specific benefits (O), internalization advantages (I), and location-specific advantages (L) (Aladelusi & Olayiwola, 2021). They claim that the latter term refers to a company's assets that enable successful compete in other markets despite lack of familiarity and the expense of establishing a subsidiary abroad. A host country must have a competitive advantage that is sufficient to fend off challenges from businesses operating there (Sean-Leigh, 2007 cited in Aladelusi & Olayiwola, 2021). This discusses the advantages of having a foreign competitive advantage over local businesses while simultaneously having effective productivity and marketing.

On the other side, geographical advantages refer to the advantages that a host nation can provide a company. Large markets, excellent infrastructure, and low labor or production costs, or both, are a few of

them. According to Wall & Ress (2004), cited in Aladelusi & Olayiwola (2021), there must be an increase in profits from leveraging a firm's ownership advantage in a prominent position relative to its local market, leading to benefits for the market's prospects in terms of either culture, economy, or both. When it is less expensive to use ownership and geographical advantages through FDI than it is to export, internalization advantage—which incorporates transaction costs—occurs. Companies today have many options to fully utilize the ownership advantage resulting from the know-how of advertising and marketing a good thanks to internalization. In summary, the location advantage is unique to the host country, but the internalization and ownership benefits are investor-specific characteristics (Aladelusi & Olayiwola, 2021). In summary, place gain is specific to the host country, whereas internalization and possession benefits are unique to the investor (Aladelusi & Olayiwola, 2021).

### **2.3 Empirical Literature**

FDI aids in boosting economic activity in the nation, enhancing the average level of living for the people. It bridges the gap between locally available finances, foreign currency, and government revenue by providing developing nations with essential resources including technology, management talent, and entrepreneurial potential. There is a wealth of studies demonstrating the connection between FDI and poverty. For example,

Adeolu (2007) used the conventional Least Square estimation method to empirically investigate the link between FDI and economic growth in Nigeria. The findings demonstrated that FDI stimulates economic growth in Nigeria. Even while FDI may not have a large overall impact on the economy as a whole, some FDI-related elements have a favorable impact on economic growth and should be promoted. Omorogbe (2007) also conducted a comprehensive study to look into how FDI affects reducing poverty in Nigeria. He utilized an ordinary least square regression method and per capita GDP as a proxy for poverty. The results indicated that FDI performed about averagely on per capita GDP in Nigeria.

Okpe and Abu (2009) used regression analysis to study the relationship between foreign direct investment and poverty alleviation in Nigeria from 1975 to 2003. They found that both foreign direct investment and foreign loans into Nigeria help to reduce poverty.

Gohou and Soumare (2012) investigated “if there are geographical disparities in how foreign direct investment lowers poverty in Africa. It was found that there is a strong, positive, and significant relationship between FDI net inflows and poverty reduction among African regions after they conducted their analysis using FDI net inflows per capita, the United Nations Development Program, and Human development index as the main variables. Additionally, it was shown that FDI had a greater influence on wellbeing in developing nations than it does in advanced nations”.

Using a Granger causality test, Olusanya (2013) looked at the relationship between economic development and Foreign Direct Investment inflows in the Nigerian economy from 1970 to 2010 in both the pre- and post-deregulation periods. The results of the causality test indicated that there was a causal relationship between economic growth (GDP) and foreign direct investment (FDI) inflows during the pre-deregulation era (1970–1986), indicating that GDP drives FDI. However, there is no causal relationship between economic growth (GDP) and FDI inflows during the post-deregulation era (1986–2010), indicating that GDP does not cause FDI. However, data from 1970 to 2010 revealed a causal link between economic development (GDP) and the inflow of foreign direct investment (FDI). This means that economic growth induces foreign direct investment inflow into the country.

In a study conducted by Adesiyani (2014), the effect of FDI on poverty reduction in Nigeria from 1980 to 2009 was examined. The results of the ECM-based estimation showed that while FDI, government spending, and infrastructure are all positively correlated with poverty reduction, inflation, national debts, and human capital are negatively correlated. In his study on foreign private investment, capital formation, and poverty alleviation in Nigeria, Simon-Oke (2014) found that FDI in Nigeria has not significantly contributed to poverty alleviation in Nigeria. He made this discovery using co-integration and error correction mechanism (ECM) and granger causality tests with annual time series data covering the period between 1978 and 2008. In a study conducted in 2014, Ogunniyi and Igberi examined the association between FDI and poverty reduction in Nigeria from 1980 to 2012. Using time-series secondary data, Ordinary Least Square technique were employed. The results showed that FDI has a positive but not significant impact on real per capita income and hence does have the potential of reducing poverty in the country. Fowowe and Shuaibu (2014) carried out “an empirical investigation on foreign direct investment (FDI) inflows and poverty in some selected African economies using system generalized method of moment, it was discovered that FDI inflows have significantly contributed to poverty reduction in African countries. The result also showed that better institutional quality and human capital development are associated with reducing poverty and better functional financial systems enhance the efficiency of FDI in reducing poverty”. Adigun et.al (2021) analyzed “the impact of FDI on poverty reduction in Nigeria. The result showed that FDI has a significant negative effect on poverty reduction in Nigeria in the short run”.

### **3. METHODOLOGY**

This study employed annual secondary data between 1991 and 2020. The data were collected from Central Bank of Nigeria (CBN), NBS statistical database and World Development Indicator database.

### 3.1 Model Specification

The main focus of this study is to examine the impact of foreign direct investment on poverty reduction in Nigeria. From our literature review, the model is hereby specified following the work of Fowowe and Shuaibu (2014) with some modifications in a functional form as follows:

$$PHCR = f(FDI, REXR, GFCF) \dots\dots\dots (1)$$

Where:

PHCR - Poverty head count ratio

FDI - Foreign direct investment

REXR - Real Exchange rate.

GFCF – Gross fixed capital formation

The econometric form of this model is therefore specified thus;

$$PHCR_t = \beta_0 + \beta_1 FDI_t + \beta_2 REXR_t + \beta_3 GFCF_t + U_t \dots\dots\dots (2)$$

Where:  $u_t$  is the error term that is assumed to be normally distributed with the mean of zero and constant variance;  $\beta_0$  = Constant term/intercept;  $\beta_1$ ;  $\beta_2$ ;  $\beta_3$  = Slope coefficient.

### 3.2 Estimation Technique

The Autoregressive Distributed Lag (ARDL) method was used in the study to investigate the connection between foreign direct investment and the decline in poverty in Nigeria. A well-known technique for estimating co-integrating relationships is called autoregressive distributed lag (ARDL), in contrast to Engle-(1987) Granger's method, which calls for all variables to be in order I(1) or calls for prior knowledge of which variables are in order I(0) and I(1) (1). To address this issue, Pesaran and Shin (1999) demonstrated that co-integrating systems can be estimated as ARDL models. This has the advantage that the ARDL cointegration technique can be used regardless of whether the underlying variables are integrated of order I(0), I(1), or both (2). However, tests for unit roots are advised in order to prevent crashing of the ARDL technique and effort in vain because variables of order I(2) integration cause the technique to crash. The first step in determining whether there is a long-term link between the variables is to determine whether that relationship exists by computing the Bounds F-statistic (bounds test for cointegration).

$$\Delta \ln PHCR = \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta \ln PHCR_{t-1} + \sum_{i=1}^q \alpha_{2i} \Delta \ln FDI_{t-1} + \sum_{i=1}^q \alpha_{3i} \Delta \ln EXR_{t-1} + \sum_{i=1}^q \alpha_{4i} \Delta \ln GFCF_{t-1} + \alpha_5 \ln PHCR_{t-1} + \alpha_6 \ln FDI_{t-1} + \alpha_7 \ln EXR_{t-1} + \alpha_8 \ln GFCF_{t-1} + \mu t \dots\dots\dots (3)$$

Where,

$\Delta$  is the first difference operator, p is the optimal lag length for the dependent variable, q is the optimal lag length for the regressors,  $\alpha_1, \alpha_2, \alpha_3, \dots, \alpha_5$  represent short-run dynamics of the model,  $\alpha_6, \alpha_7, \alpha_8, \alpha_9$  and  $\alpha_{10}$  represent the long-run elasticity.

## 4. RESULT AND DISCUSSION

### 4.1 Test for Stationarity

**Table 1: Summary of ADF Unit Root Test**

Variables	ADF Statistics	Probability	Order of Integration
PHCR	-5.189369	0.0010	1(1)
FDI	-3.797586	0.0313	1(0)
EXR	-4,445635	0.0062	1(1)
GFCF	-4.420121	0.0014	1(1)

Source: Author's computation using E-views 10

The first step to analyze time series data is to ensure the variables are stationary so as to avoid spurious regression. To do this, ADF unit root test was conducted and the result is shown in the table above. From the result, poverty head count ratio (PHCR), exchange rate (EXR) and gross fiscal capital formation (GFCF) are stationary at first difference that is, they are integrated of order 1(1) while foreign direct investment is stationary at levels, that is, integrated of order zero I(0). In order to test for cointegration among the variables, bound test was carried out through autoregressive distributed lag model (ARDL) as proposed by Pesaran et al (2001).

### 4.2 COINTEGRATION TEST

**Table 2: Summary of ARDL Bounds Test**

Null Hypothesis: Long-run relationships exist

Test Statistic	value	k
F-statistic	3.658011	3
<b>Critical value bounds</b>		
Significance	10 Bound	11 bounds
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Source: Author's computation using E-views

The result of the ARDL Bounds test is presented in table 2. From the result, the F-Statistic of 3.658011 is greater than 1(0) value of 2.79 at 5 per cent level of significance. This shows that there is a long run relationship among all the variables; therefore we reject the Null Hypothesis. Based on this, the Short run ARDL model was conducted and the result is presented in table 3.

### 4.3 ARDL MODEL RESULT

**TABLE 3: SUMMARY OF ARDL RESULT**

Dependent Variable: PHCR  
 Method: ARDL  
 Date: 07/08/22 Time: 12:07  
 Sample (adjusted): 1989 2020  
 Included observations: 32 after adjustments  
 Maximum dependent lags: 4 (Automatic selection)  
 Model selection method: Akaike info criterion (AIC)  
 Dynamic regressors (4 lags, automatic): FDI GFCF REXR  
 Fixed regressors: C  
 Number of models evaluated: 500  
 Selected Model: ARDL(4, 4, 4, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
PHCR(-1)	0.307006	0.224280	1.368853	0.1912
PHCR(-2)	-0.084875	0.167291	-0.507350	0.6193
PHCR(-3)	-0.115336	0.128853	-0.895101	0.3849
PHCR(-4)	-0.124842	0.077492	-1.611037	0.1280
FDI	5.37E-11	7.25E-11	0.740133	0.4706
FDI(-1)	-8.57E-11	6.20E-11	-1.383906	0.1866
FDI(-2)	-1.22E-10	7.35E-11	-1.655689	0.1186
FDI(-3)	-8.89E-11	6.91E-11	-1.286383	0.2178
FDI(-4)	-8.06E-11	6.85E-11	-1.177095	0.2575
GFCF	-3.55E-12	1.15E-11	-0.307295	0.7628
GFCF(-1)	2.20E-11	1.53E-11	1.436778	0.1713
GFCF(-2)	-2.41E-11	1.46E-11	-1.650699	0.1196
GFCF(-3)	1.37E-11	1.71E-11	0.798364	0.4371
GFCF(-4)	4.85E-11	1.98E-11	2.448543	0.0271
REXR	-0.004357	0.004390	-0.992324	0.3368
REXR(-1)	-0.009073	0.004999	-1.814861	0.0896
C	1.436709	0.477777	3.007067	0.0088
R-squared	0.921274	Mean dependent var		1.009783
Adjusted R-squared	0.837299	S.D. dependent var		0.732779
S.E. of regression	0.295575	Akaike info criterion		0.705025
Sum squared resid	1.310467	Schwarz criterion		1.483697
Log likelihood	5.719600	Hannan-Quinn criter.		0.963133
F-statistic	10.97088	Durbin-Watson stat		2.833029
Prob(F-statistic)	0.000015			

\*Note: p-values and any subsequent tests do not account for model selection.

Source: Author's Computation using Eview

The above result indicates that poverty head count ratio, foreign direct investment, GFCF and real exchange rate are not statistically significant at 5 percent level of significance since their

P-values are greater than 0.05. Also, the lag value of gross fiscal capital formation is statistically significant and has a negative effect on poverty head count ratio. If foreign direct investment, gross fiscal capital formation and real exchange rate changes by 1%, poverty head count ratio increases by 5.37% for

foreign direct investment while it decreases by 3.55% and 0.0% for gross fiscal capital formation and real exchange rate respectively. The R-squared in this result shows that foreign direct investment, gross fiscal capital formation and real exchange rate has 92% explanatory power on poverty head count ratio which is our dependent variable. While the adjusted R- squared is approximately 0.84. This implies that all the independent variable namely, foreign direct investment, gross fiscal capital formation and exchange rate explains about 84% variations noticed in the poverty head count ratio. The F- statistics is to know the overall significance of the model. The probability of F-statistics is 0.000015 which indicates that the model is statistically significant. The durbin watson statistics result (DW) is 2.83 indicating there is no presence of autocorrelation in the model.

#### 4.4 Diagnostic Tests

This subsection shows the results of the residual diagnostic tests conducted after estimation. **4.4.1 Serial Correlation Test**

**Table 4: Breush-Godfrey Serial Correlation LM Test**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	7.813965	Prob. F(2,13)	0.0059
Obs*R-squared	17.46874	Prob. Chi-Square(2)	0.0002

**Source: Author's computation using E-views 10**

From the result in table 4, the F-Statistic and Obs\*R-squared values of 7.813965 and 17.46874 with p values of 0.0059 and 0.0002 respectively are lesser than the critical values of 0.05 level of significance. Hence, we conclude that there is serial correlation in the model.

#### 4.5 Heteroscedasticity Test

**Table 5: Heteroscedasticity Test: Breusch-Pagan-Godfrey**

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.007297	Prob. F(16,15)	0.4966
Obs*R-squared	16.57423	Prob. Chi-Square(16)	0.4137
Scaled explained SS	3.006183	Prob. Chi-Square(16)	0.9998

**Source: Author's computation using Eviews 10**

The P values of F-statistics and Obs\* R- squared are greater than the critical value of 5% level of significance. It means that the model is free from heteroscedasticity, that is, the mean, variance and covariance are constant over time.

#### 4.6 Stability Test

To test whether the model is stable or not, both the cumulative sum and the cumulative sum of squares tests are conducted.

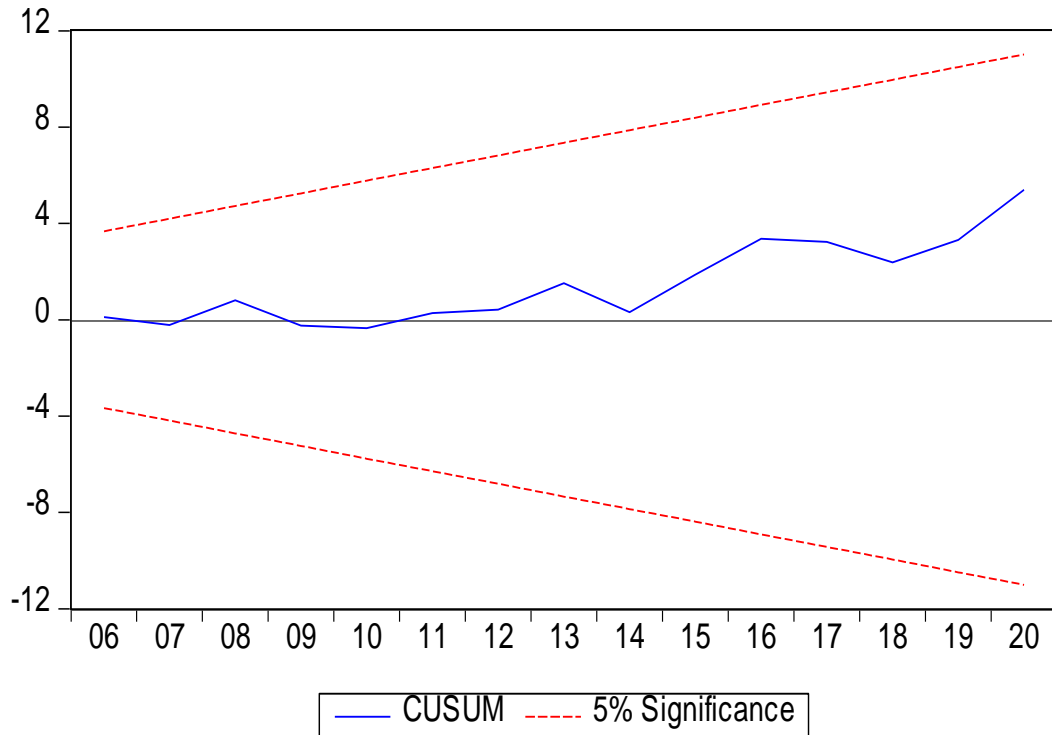
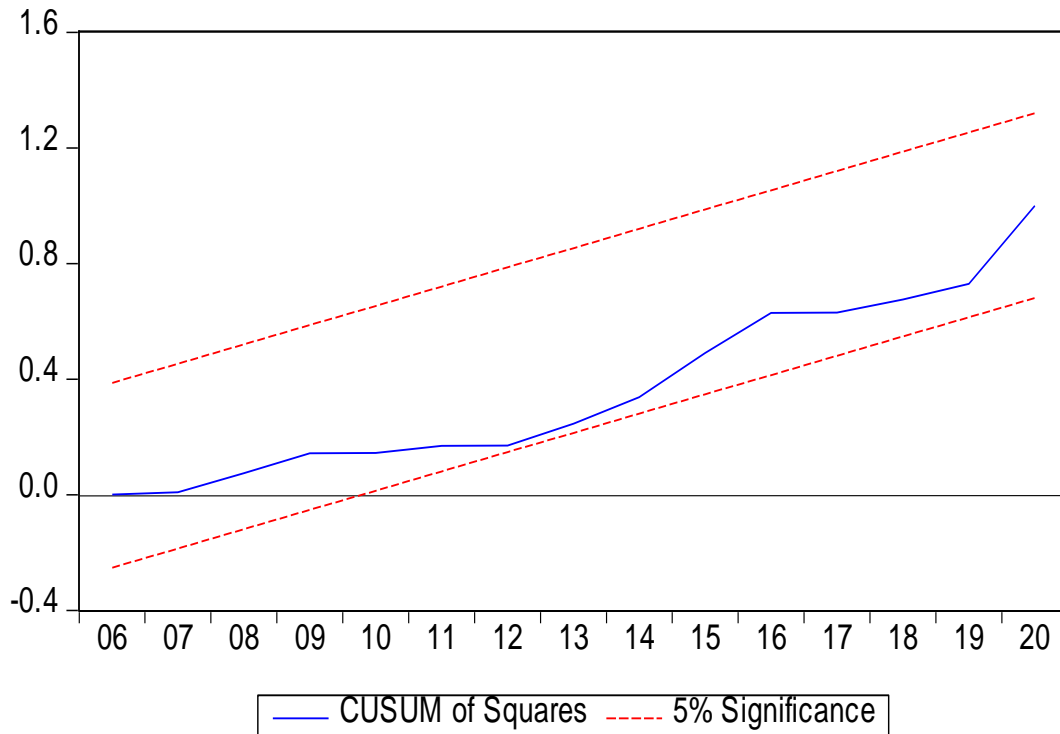


Figure 1 Plot of Cumulative sum

Source: Author's computation using E-view



## **Figure 2: Plot of cumulative sum of squares**

The result in figure 1 which is cumulative sum shows that the model and the estimated parameters are stable because the graph moves within the 0.05 critical values. Likewise, cumulative sum of squares test in figure 2 shows that the model and the estimated parameters are largely stable throughout the period under investigation since the blue line curves within the red lines indicating 5% level of significance.

## **5. CONCLUSION AND RECOMMENDATIONS**

This paper examined the impact of foreign direct investment in driving one of the key goals of sustainable development-poverty reduction in Nigeria. Annual data from 1985 to 2020 were used to achieve the study's goal, and the autoregressive distributed lag (ARDL) model was applied for its empirical analysis. The findings indicate that FDI has a negative influence on poverty and does not thereby alleviate it in the nation. Also, the lag value result shows that Nigeria's poverty head count ratio is significantly impacted by gross fiscal capital formation. Furthermore, only GFCF out of the majority of foreign direct investment components made a significant contribution to the decline in poverty in Nigeria. This suggests that FDI have little potential to help Nigeria reach Sustainable Development Goal 1, which is to reduce poverty. Finally, the outcome of the ARDL Bounds test demonstrates that all of the variables have a long-term relationship. It is crucial that this study provide the policymakers in Nigeria with the recommendations listed below. To decrease poverty in Nigeria, government should promote gross fixed capital production. And the fact that FDI does not help reduce poverty has substantial policy implications, particularly for trade and FDI policies, which need to be carefully examined to make FDI growth enhancing in Nigeria. Therefore, government should map out strategies that will increase FDI in order to achieve sustainable development goal-1 which is poverty reduction.

### **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

### **AUTHOR'S CONTRIBUTION**

This research work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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