Foreign Direct Investment and Poverty in Nigeria

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ABSTRACT

This study aims to provide light on how FDI affects poverty in Nigeria through agriculture sector, manufacturing sector, and service sector. Using yearly data series spanning 41 years, from 1981 to 2021, the research empirically evaluates the influence of FDI on poverty in Nigeria. The study's dependent variable was the poverty rate (PVT), while the independent variables were foreign direct investment (FDI) into agriculture (FDI), manufacturing (FDIM), services (FDIS), trade openness (OPN), and exchange rate (EXR). Statistical tools such as descriptive analysis, unit root testing, and ECM modelling were used to assess data that was retrieved from secondary sources. Foreign Direct Investment (FDI) in the agriculture sector decreases the poverty rate, FDIM in the manufacturing sector increases the poverty rate, FDIS in the service sector increases the poverty rate, OPN decreases the poverty rate, and EXR increases the poverty rate in Nigeria, according to the ECM. Foreign direct investment (FDI) did not alleviate poverty in Nigeria during the research period. The research concludes that foreign direct investment (FDI) may help Nigeria's economy expand and alleviate poverty if the government takes steps to attract FDI, such as lowering taxes, subsidizing infrastructure, and eliminating import duties.

1. Introduction

Everyone feels the effects of poverty in their own unique manner. Having an income that is lower than a certain basic standard of living is one definition of poverty, including income inequality (Odozi & Uwaifo Oyelere, 2023). Poverty has exploded in Nigeria, a nation with a thriving economy that is well-known throughout Africa. World Bank data from 2018 shows that 83 million people, or around 40% of the population, living below the poverty line, with an additional 25 million people, or about 25% of the population, being vulnerable (Megbowon et al., 2023). According to the World Bank, 12 million more Nigerians would fall below the global poverty line between 2019 and 2023. There are many negative consequences for individuals and the economy as a whole due to the rising poverty rate. This includes the gender gap in gaining access to productive resources (Adeoye et al., 2019; Nwaka et al., 2020; Oyewunmi & Obayelu, 2023). The government plays a significant role in reducing public infrastructure failures (Monyei et al., 2018). Despite the government's heightened focus on poverty throughout the economy, this significant growth in poverty remains.

Foreign direct investment (FDI) and other forms of foreign capital are crucial to emerging economies. As a complement, it has helped the economy expand and thrive. Regardless, technological advancements and improved management abilities often accompany it (Olaoye &

Zerihun, 2023), and these two factors determine the rate of economic progress. FDI may help developing countries break the cycle of poverty and contribute to economic growth in other ways as well. Investments from outside have been a game-changer in terms of globalization and the flow of capital into developing nations in recent years. Foreign direct investment aims to boost economic development and alleviate poverty by increasing business production and facilitating the transfer of technology and technical skills. A country's economic progress is propelled in large part by foreign direct investment. Just said, FDI is one of the most important factors in a country's economic stability.

For the first time since Q4 2015, Nigeria's FDI grew to $378.4 million in Q4 2017, according to the National Bureau of Statistics (2017). In comparison to Q3 2017 and the previous quarter, this number jumped 221.8% and 9.8%, respectively, in Q4 2017. Equity investment accounted for 99.8 percent of the rise in foreign direct investment, with a further important contribution of 0.2 percent coming from all other working capital, according to the National Bureau of Statistics (2017) report.

Developing nations are able to receive cash via FDI (Sabir et al., 2019), which helps alleviate the federal government's budget deficit, one of them is through supporting local businesses for gender equality and empowering women entrepreneurs (Fang et al., 2023). This means that developing nations will be able to improve their financial systems and gain access to international commerce via FDI. Some argue that FDI helps boost the (host) economy's overall investment by boosting savings rates at home (Bermejo Carbonell & Werner, 2018; Ricardo & Camargo, 2020). The few pieces of micro and macro-level empirical data that support the idea of foreign direct investment (FDI) as a growth tool for economies.

Foreign Direct Investment

The World Bank (2022) states that FDI occurs when capital flows into a company in an economy other than the investors in order to obtain a long-term managerial stake (10% or more of voting shares). Developing countries can leverage FDI as a source of external financing (Aust et al., 2020). According to the balance of payments, it is the total of equity capital, profits reinvestment, other long-term capital, and short-term capital (Bird & Choi, 2020). A kind of international investment known as "foreign direct investment" occurs when a person or group based in one country has a long-term stake in and exerts substantial control over a business based in another one. A person or corporation from another nation makes a direct investment in a country's production or business when they purchase a company there or increase the output of an existing business there (Acquah & Ibrahim, 2020; Slesman et al., 2021). In this research, FDI is defined as the process by which a domestic firm gains majority ownership in a foreign company. But the other country's day-to-day activities are heavily influenced by international corporations. This implies they are bringing more than just financial resources; they are also bringing expertise, experience (Salahuddin et al., 2018), and new technologies (Asongu & Odhiambo, 2020).

Poverty

There is a difference between absolute and relative poverty. If a person does not have access to enough food, housing, clean water, sanitation, medical care, education, or information, they are said to be living in absolute poverty. Additionally, the availability of fundamental living requirements, in addition to financial resources, determines absolute poverty. The United Nations (2015) defines relative poverty as the bare minimum that a society accepts as a quality of life for its members.

Someone is considered poor if they do not have enough money to cover basic living expenses (Eryong & Xiuping, 2018; Li, 2018). This includes individuals, families, and communities. Living in extreme poverty means scrounging for every need, including food, clothes, shelter, and healthcare. According to this view, poverty exists when people or communities do not have access to enough money or other resources to meet their most fundamental needs, including health (Shandmi et al., 2020).

Poverty might be attributed to a lack of resources, an innate lack of resources, or the paradoxical accumulation process in capitalist societies. Additionally, wasteful utilization of shared resources is what causes poverty. This may be the result of a lack of resources (such as money, technology, and suitable infrastructure) or bad policy. The United Nations Development Programme

(2000) and the World Bank Institute (2019) have different definitions of poverty. The former states that it is the inability to meet basic needs such as food, clothes, housing, medical care, or education. The latter states that it is the case when a person's spending falls below a certain level. If a person's income is less than a certain threshold, they are considered to be living in poverty according to this research. Those whose intended standard of living, as determined by their employment-based income, drops below the poverty line are deemed poor under this definition.

Internalization Theory of Foreign Direct Investment
In 1976, Buckley and Casson established the internalization hypothesis of FDI. In 1976, Hymer introduced it in an international one. The theory's stated goal is to provide light on the expansion of multinational corporations and the factors that drive their pursuit of FDI. First, that enterprises would maximize profits even in an imperfect market is one of the assumptions upon which the theory rests. Second, it presupposed that building an internal market would be a good way to avoid flawed intermediate product marketplaces. Lastly, the thesis presupposed that MNCs are the result of global markets becoming internalized. Although research and development spending in Nigeria is lower than in other developing nations, this can work to Nigeria's advantage in the fight against poverty if FDI-involved international corporations choose to internalize some of the country's procedures.

Foreign Direct Investment into Agriculture Sector and Poverty
Foreign direct investment (FDI) in Ghana's agricultural sector and GDP growth (Arthur & Addai, 2022). A variety of statistical methods, including as ECM, descriptive statistics, and the unit root test, were used to examine the data (Awunyo-Vitor & Sackey, 2018). The research assumed that trade openness, capital, and government spending were independent variables in the relationship between FDI in Ghana's agricultural sector and the independent variable. The research also found that trade volume and foreign direct investment flowing into the agriculture sector were positively and significantly correlated with economic growth. Government spending, on the other hand, has a strong negative correlation with GDP growth. With a focus on Ghana, the study adds to the growing body of literature on economic growth by filling a gap in the literature about the role of foreign direct investment (FDI) in fostering agricultural development, which in turn supports job creation and overall economic development. Therefore, the research suggests that Ghana's policymakers prioritise trade policies that are both flexible and attractive to foreign direct investment (FDI) in order to boost agricultural output and overall economic development.

Foreign Direct Investment into Manufacturing Sector and Poverty
Previous research show that foreign direct investment (FDI) and the development of manufacturing sector output are related over the long term (Janz, 2018). Government should invest in infrastructure, such as electricity supply, to increase the absorption capacity of manufacturing enterprises, thereby maximizing the benefits of foreign direct investment (FDI) in the industry. In addition, the government's policies should lay out specific targets for foreign investment, such as the manufacturing sector. The issue of corruption and the diversion of money was raised, among other things, and it was suggested that the industrial sector try to boost its productivity by enhancing its technology.

The manufacturing sector has not made an encouraging positive contribution due to many obstacles, one of which is a lack of capital (Oluleye & Oghenebrume, 2019). Consequently, it might be a good thing that money is flowing in from other countries. Government officials should prioritize the factors that demonstrate substantial linkages to MSOG, such as power generation, currency rate, private sector lending, and political stability, according to the research. This will help diversify the economy via manufacturing.

Manufacturing sector is crucial to Nigeria's economy and that the federal government should allocate more foreign direct investments (FDI) to it so that it can work more efficiently (Ajide et al., 2022), particularly in terms of its percentage impact on GDP and job creation. foreign direct investment (FDI) is positively correlated with the manufacturing sector, but negatively correlated with inflation and export. The government had to come up with impartial policies and foster an atmosphere conducive to business that would attract investors (Anisiobi et al., 2022). This means the government has to step up its reform efforts, invest more in infrastructure, and tighten monetary

policy to reduce inflation and boost the country's gross domestic product (GDP). Incoming and outbound FDI are major drivers of manufacturing sector development in the MENA area. foreign direct investment (FDI) can have a positive effect on a country's manufacturing sector if it makes good use of domestic raw materials made in the host country to make goods abroad. MENA nations should prioritize policies that enhance the efficient use of local resources in order to attract foreign direct investment, which may stimulate development in the manufacturing sector. It is also important to support measures that will increase foreign direct investment (FDI) into the area. Foreign direct investment (FDI), both incoming and outbound, should be seriously regarded as a tool for MENA economic policymakers looking to boost the manufacturing sector.

Foreign Direct Investment into Service Sector and Poverty
The overall evaluations reveal that foreign direct investment (FDI) in services might significantly contribute to African economic development (Fiorini et al., 2023), when government policy and action remain unchanged. This suggest that policymakers should encourage the growth of service-oriented businesses (Eze et al., 2020) in order to boost the sectoral proportion of GDP. Increased plant survival often leads to societal affluence, more inclusive growth and development, and the creation of employment are all possible outcomes of such an expansion.

Therefore, this research analyzes the ways in which foreign direct investment (FDI) has affected poverty and other variables (Tsaurai, 2018), as well as the factors that have prevented FDI from flowing into the nation. Developing nations have benefited greatly from FDI in many ways, including increased economic activity and the creation of new jobs. Crucially, these theories remain incongruous with the Nigerian economy, which is preventing the cycle of poverty. Gaining a grasp on how FDI might worsen poverty is another valuable way to comprehend the effects on the economy. Accordingly, this study aims to provide light on how FDI affects poverty in Nigeria through the following questions:

- Does FDI in agriculture affect poverty in Nigeria
- Does FDI in the manufacturing sector impacts poverty in Nigeria
- Does FDI in the service sector affect poverty in Nigeria

2. Methods
The impact of FDI on poverty in Nigeria will be investigated using the ex-post facto research methodology. In an ex-post facto study, also known as after-the-fact research, the researcher waits until after the event has already taken place before beginning their examination. This section examines the impact of a number of independent factors. The researcher may find out how the independent factors affect the dependent variable and whether there is any interaction between them using this approach. The use of secondary data to examine the effect of the independent variable on the dependent variables is a benefit of ex-post facto design. The information for this research will come from secondary sources and will be based on yearly time series that span 41 years, from 1981 to 2021. World development indicators (WDI), yearly reports and statements of accounts, and the statistical bulletin of the Central Bank of Nigeria (CBN) are among the publications that fall under this category. We will collect information on poverty (PVT), foreign direct investment (FDI) in agricultural (FDIA), FDI in manufacturing (FDIM), FDI in services (FDIS), trade openness (OPN), and exchange rate (EXR) from 1981 to 2021 from all these sources.

In 1986, Paul Romer and Robert Lucas put out the premise of foreign direct investment (FDI)-led economic development, which would serve as the foundation for this study's methodology. The reason for this is that FDI, along with other elements like human capital, exports, technology transfer, and capital, has a substantial effect on boosting economic development, which ultimately leads to a decrease in poverty, as stated in the theory. The theory also notes that the host country's economy might benefit from FDI inflows because of the increased capital stock, the creation of new jobs, and the facilitated transfer of knowledge. As investors establish new businesses in other nations, the thinking goes, it generates additional possibilities and more employment. As a result, residents' incomes rise and their buying power increases, which boosts the targeted economies as a whole and helps alleviate poverty. To assess the influence of the explanatory factors on the dependent variable, this research used descriptive statistics, unit root test, cointegration, and Error Correction Mechanism (ECM) modelling approaches.

Hypotheses statements of the research:

H1: FDI into agriculture sector cannot reduce poverty in Nigeria
H2: FDI into manufacturing sector cannot reduce poverty in Nigeria
H3: FDI into service sector cannot reduce poverty in Nigeria

The following is the model put forth by Anetor et al., who investigated the effect of FDI, assistance, and trade on poverty reduction in nations in Sub-Saharan Africa:

$$HDI = F (FDI, FAD, TRADE, GDPPCG, GCF, POP, INF) \qquad (3.1)$$

Where;

HDI	= Human Development Index a Proxy for Poverty		
GDPPCG	= Per Capita Growth in GDP	INF	= Inflation
FDI	= Foreign Direct Investment	FAD	= Foreign Aid
POP	= Annual Population Growth.	TRADE	= Trade Openness
GCF	= Gross Capital Formation		

Also, Adigun and Oke (2021) examined the impact of foreign direct investment on poverty reduction in Nigeria and modelled:

$$PVT = f (FDI, INF, UNEMP, TRO, EXR) \qquad (3.2)$$

Where;

PVT = Poverty rate
FDI = Foreign direct investment
INF = Inflation rate in the country
UNEMP = Unemployment rate
TRO = Trade openness
EXR = Exchange rate

This study differs from others in that it uses poverty rate as its dependent variable and uses FDI into agriculture (FDIA), FDI into manufacturing (FDIM), and FDI into services (FDIS) as its main explanatory variables, with trade openness (OPN) and exchange rate (EXR) serving as its check variables.

The model's functional connection should be expressed as:

$$PVT = f (FDIA, FDIM, FDIS, OPN, EXR) \qquad (3.3)$$

The mathematical form of the model or equations (3.3) takes the form of;

$$PVT_t = \beta 0 + \beta 1 FDIA_t + \beta 2 FDIM_t + \beta 3 FDIS_t + \beta 4 OPN_t + \beta 5 EXR_t \qquad (3.4)$$

The linear econometric form of the model or equations (3.4) takes the form of;

$$PVT_t = \beta 0 + \beta 1 FDIA_t + \beta 2 FDIM_t + \beta 3 FDIS_t + \beta 4 OPN_t + \beta 5 EXR_t + \mu t1 \qquad (3.5)$$

Where:

PVT = Poverty rate
FDIA = Foreign direct investment into the agriculture sector
FDIM = Foreign direct investment into the manufacturing sector
FDIS = Foreign direct investment into the service sector
OPN = Trade openness
EXR = Exchange rate
$\beta 0$ is the intercept
$\beta 1 – \beta 5$ are the coefficients of independent variables while $\mu 1$ is the error terms.

Description of Variables
Dependent Variable
In this study, poverty Rate (PVT) shall be used to proxy poverty as the dependent variable in the model.

(i) Poverty Rate (PVT)

When people or a group do not have access to enough money or other resources to maintain even a basic level of life, we say that they are poor. When a person's earnings are so low that they are unable to cover their most fundamental living expenses, we say that they are poor. Housing, safe drinking water, nutritious food, and medical care may all be out of reach for low-income families and individuals. In 2015, the UN provided both an absolute and a relative definition of poverty. They looked at extreme poverty as a condition characterized by a severe lack of resources for people's health, nutrition, housing, education, employment, and information and communication. For them, the ability to access life itself is a determinant of absolute poverty, not just money. The United Nations used a person's minimum tolerable level of life as a criterion for defining relative poverty. Poverty rates may vary from country to country based on a variety of factors. Researchers in this research utilized the proportion of the population that lives on less than $1.90 per day.

Independent Variables

Any variable that has the potential to affect the dependent variable, or response, is called an independent or explanatory variable. The primary explanatory factors in this study's model will be FDI in agricultural (FDIA), FDIM in manufacturing, and FDIS in services, with trade openness (OPN) and exchange rate (EXR) serving as tick variables.

(i) Foreign Direct Investment into Agriculture (FDIA)

When a corporation based in one nation buys out another's agricultural industry, this is called foreign direct investment in agriculture (FDIA). Foreign direct investment (FDI) in agriculture occurs when multinational corporations take an active role in the running of the agricultural sector in a foreign country. This implies they are contributing more than just financial resources to the agriculture industry; they are also offering expertise, experience, and new technologies. One theory proposes that FDI in agriculture (FDIA) has a negative correlation with poverty. That is, poverty levels will fall as a result of more FDI in the agricultural sector. Thus, $(\delta PVT/\delta FDIA) < 0$.

(ii) Foreign Direct Investment into Manufacturing (FDIM)

When a corporation based in one nation buys out another manufacturing company based in another country, this is called foreign direct investment in manufacturing (FDIM). When a foreign company invests in a country's manufacturing sector, it becomes an active participant in the day-to-day running of that industry. This implies that they are contributing not just financial resources to the manufacturing sector, but also expertise, experience, and new technologies. It is believed that there is a negative correlation between poverty and Foreign Direct Investment into manufacturing (FDIM). To rephrase, less poverty will result from more FDI in manufacturing. Thus, $(\delta PVT/\delta FDIM) < 0$.

(iii) Foreign Direct Investment into Service (FDIS)

A company's acquisition of a service business entity in another nation is known as foreign direct investment in services (FDIS). When a nation offers foreign direct investment (FDI) services, it means that foreign corporations are actively engaged in running the service industry there. So, they're not just bringing cash to the service industry; they're also bringing expertise, experience, and new technology. It is believed that there is a negative correlation between poverty and Foreign Direct Investment into services (FDIS). To rephrase, less poverty will result from more FDI in the service sector. Thus, $(\delta PVT/\delta FDIS) < 0$.

(iv) Trade Openness (OPN)

How open a country's economy is to trade with other economies is a measure of its trade openness. The trade openness, also known as the degree of openness, may be calculated by dividing GDP by the sum of exports and imports. Economies that are more open tend to have more market possibilities, but they may also be more competitive with companies from other countries. Thus, $(\delta PVT/\delta OPN) < 0$.

(v) Exchange Rate (EXR)

The value of one currency relative to another is known as the exchange rate. Thus, the rate will be dictated by the supply and demand for each currency, just like any other price. Since trading

partners' currencies vary, this price or rate has been determined in international commerce. The exact exchange rate between one US dollar and one Nigerian naira was taken into account for this research. Thus, $\delta PVT/\delta EXR < 0$.

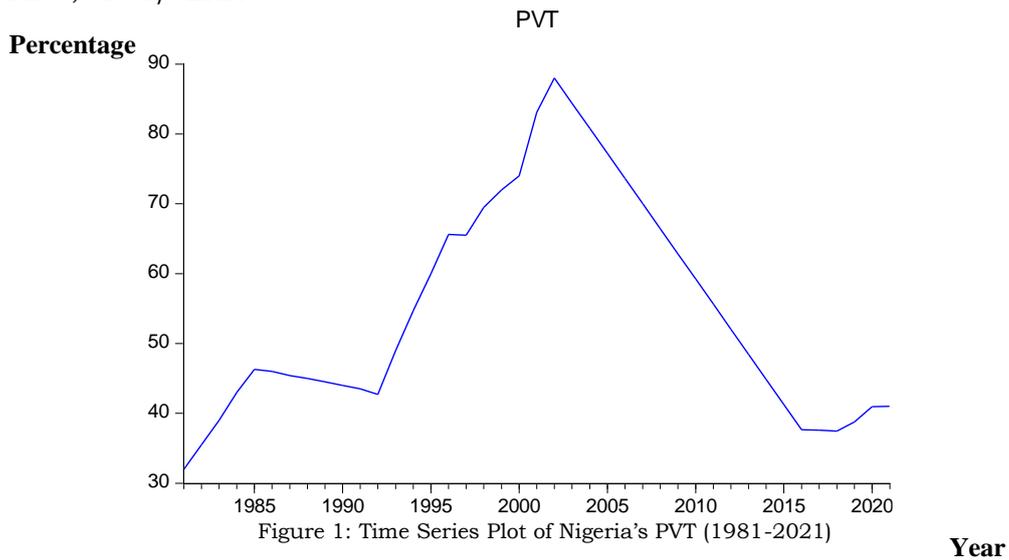Figure 1: Time Series Plot of Nigeria's PVT (1981-2021)

Figure 1 demonstrates The graph of Nigeria's poverty rate over time. It shows that over the research period, the poverty rate (PVT) in Nigeria changed. For example, as shown in figure 1, it rose continuously from 1981 to 1985, then fell slowly in 1992, reached its high in 2002, and then fell steadily from 2003 to 2021.

Figure 2: Time Series Plot of Nigeria's FDIA (1981-2021)
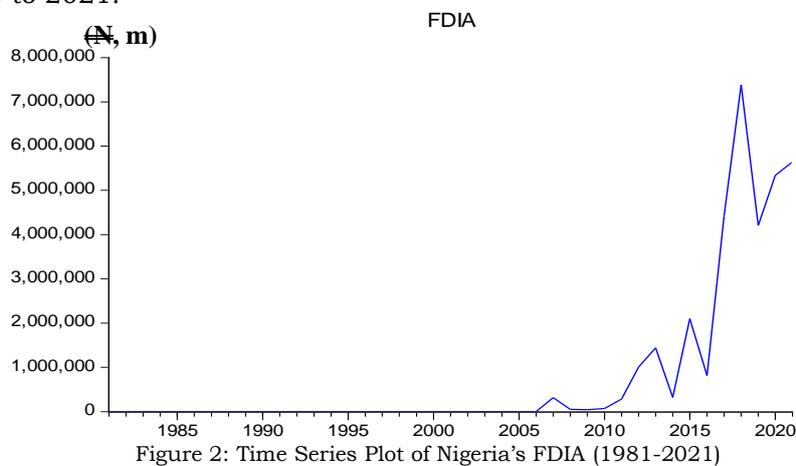
Foreign Direct Investment into Agriculture (FDIA) in Nigeria is shown in Figure 2 as a time series plot. Foreign Direct Investment (FDIA) values in Nigeria's agriculture have been on the rise during the research period, as seen in figure 2. From 1981 to 1990 and again up to the year 2000, for example, it rose at a steady rate. Once again, the graphic shows that there have been fluctuations throughout 2017, with a high in 2018 and a subsequent decline until 2021.
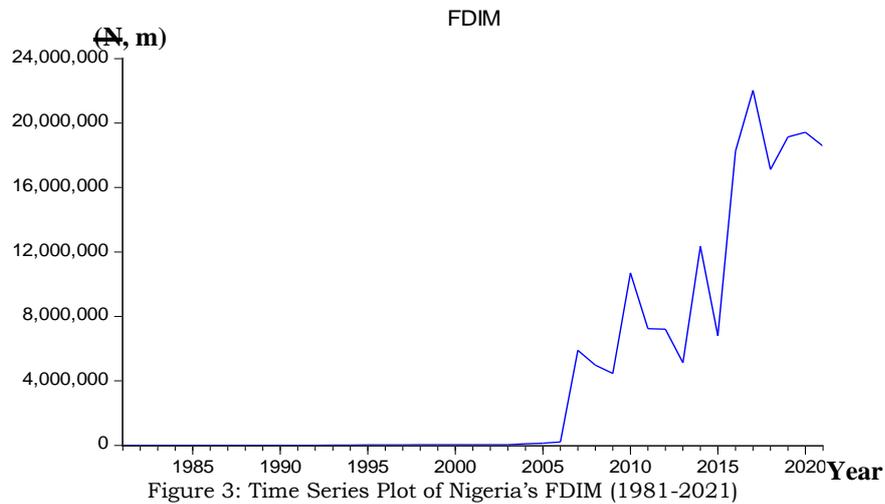
FDIM

(N, m)

Figure 3: Time Series Plot of Nigeria's FDIM (1981-2021)

Foreign Direct Investment into Manufacturing (FDIM) in Nigeria is shown in Figure 3 as a time series plot. The upward trend in the values of Nigeria's FDIM during the time period considered in this research is seen in figure 3. For example, as seen in the picture, it rose steadily from 1981 to 1995 to 2009, then fluctuated up and down until 2016, then peaked in 2017, and then declined until 2021.

FDIS

(N, m)
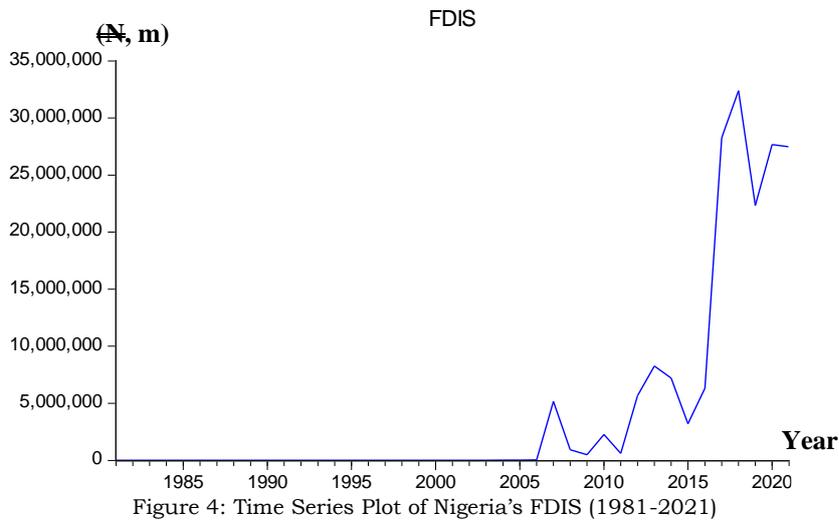
Figure 4: Time Series Plot of Nigeria's FDIS (1981-2021)

The graph of Nigeria's FDIS (Foreign Direct Investment into Services) over time is shown in Figure 4. The values of Nigeria's Foreign Direct Investment into Services (FDIS) have been trending upwards and fluctuated during the research period, as shown in figure 4. As an example, it rose slowly from 1981 to 1999, then fell and fluctuated until 2016, hit its high in 2018, and then fell again until 2021, as seen in the figure 5.

The trade openness (OPN) of Nigeria is shown in Figure 5 as a time series plot. During the course of the investigation, there were noticeable fluctuations, as shown in figure 5. For example, as shown in the image, it exhibited erratic behavior between 1981 and 2010, peaked in 2011, and then exhibited more erratic behavior until 2021.

Figure 5: Time Series Plot of Nigeria's OPN (1981-2021)

3. Results

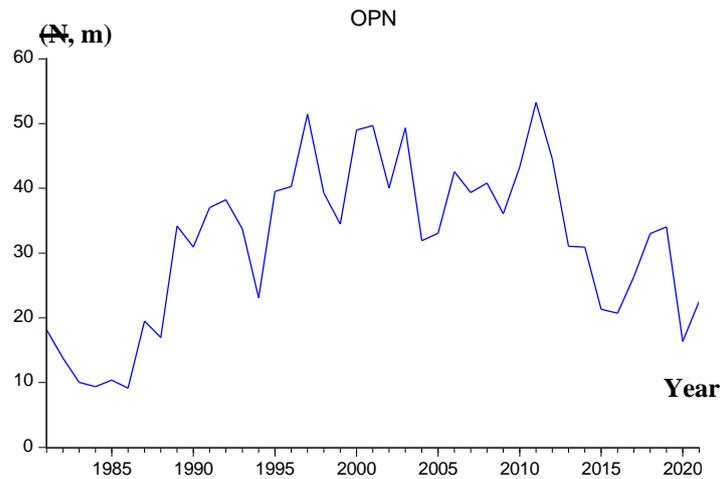According to Table 2 descriptive data, the poverty rate (PVT) had a mean of 54.59756 and a standard deviation of 15.73820. A long-right tail is shown by the positive skewness score of 0.574148 for the Poverty rate (PVT). However, being platykurtic, the kurtosis value of 2.060978 is less than 3. In other words, the series are less than average, indicating that the distribution is flat. Foreign direct investment (FDI) into the agricultural sector (FDIA) showed a mean of 8.899930 and a standard deviation of 3.866278. Foreign direct investment (FDI) into the agricultural sector (FDIA) has a long-right tail, according to its positive skewness value of 0.611138.

Table 2: Descriptive Statistics

	PVT	FDIA	FDIM	FDIS	OPN	EXR
Mean	54.59756	8.899930	11.92363	11.02913	31.67488	3.597514
Median	48.45000	7.097549	10.53952	9.394019	33.72000	4.711600
Maximum	88.00000	15.81480	16.90792	17.29350	53.28000	6.031190
Minimum	32.00000	4.764735	7.441731	6.642748	9.140000	-0.478036
Std. Dev.	15.73820	3.866278	3.456407	3.695885	12.42982	2.009368
Skewness	0.574148	0.611138	0.272402	0.560692	-0.260363	-0.804266
Kurtosis	2.060978	1.811350	1.461024	1.657511	2.128428	2.382743
Jarque-Bera	3.758923	4.965865	4.553148	5.227120	1.760939	5.070986
Probability	0.152672	0.083498	0.102635	0.073273	0.414588	0.079223
Sum	2238.500	364.8971	488.8690	452.1943	1298.670	147.4981
Sum Sq. Dev.	9907.639	597.9242	477.8699	546.3826	6180.015	161.5024
Observations	41	41	41	41	41	41

Source: *Author's Computation (2023)*

An average of 11.92363 with a standard deviation of 3.456407 was found for foreign direct investment (FDI) into the manufacturing sector (FDIM). Foreign direct investment (FDI) into the manufacturing sector (FDIM) has a long-right skewness score of positive 0.272402. A mean value of 11.02913 and a standard deviation of 3.695885 were found for foreign direct investment (FDI) into the service sector (FDIS). Foreign direct investment (FDI) into the services sector (FDIS) has a long-right tail, according to its positive skewness score of 0.560692. A mean of 31.67488 and a standard deviation of 12.42982 were found for trade openness (OPN). The average exchange rate (EXR) was 3.597514 with a standard deviation of 2.009368. There is a long-left tail in the exchange rate (EXR) since its skewness value is negative (-0.804266).

(i) Co-integration Test Result for the Model

The result of co-integration test for the Model is presented in Table 3. This will enable us determine if there exists long run equilibrium relationship among the variables in the model.

Table 3: Co-integration Test Result for Model

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.703538	128.9801	95.75366	0.0000
At most 1 *	0.691079	82.77836	69.81889	0.0033
At most 2	0.385386	38.14088	47.85613	0.2959
At most 3	0.256673	19.64398	29.79707	0.4473
At most 4	0.176219	8.372439	15.49471	0.4265
At most 5	0.026130	1.006125	3.841466	0.3158

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* Denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.703538	46.20171	40.07757	0.0091
At most 1 *	0.691079	44.63747	33.87687	0.0018
At most 2	0.385386	18.49691	27.58434	0.4543
At most 3	0.256673	11.27154	21.13162	0.6202
At most 4	0.176219	7.366314	14.26460	0.4468
At most 5	0.026130	1.006125	3.841466	0.3158

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: *Author's Computation (2023)*

At the 5% significance level, two co-integrating equations are indicated by the trace test statistics and the max-eigen statistics, as shown in Table 3, which shows the results of the co-integration. This points to the presence of a long-term link between the model's variables. That is why the research agrees with the alternative hypothesis and disagrees with the null hypothesis, which states that the variables do not co-integrate.

(ii) Over-Parameterized ECM Estimation Results for the Model

The result of overparametrized ECM estimation of the Model is presented in Table 4.

Table 4: Overparameterized ECM Estimation Results for Model

Dependent Variable: D(PVT)
Method: Least Squares
Sample (adjusted): 1984 2021
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.796774	0.727611	-1.095055	0.2872
D(PVT(-1))	0.812018	0.182338	4.453362	0.0003
D(PVT(-2))	0.151291	0.217780	0.694697	0.4957
DLOG(FDIA)	-2.040176	0.864640	-2.359566	0.0291
DLOG(FDIA(-1))	-0.847696	0.875180	-0.968596	0.3449
DLOG(FDIA(-2))	-0.454745	0.689904	-0.659143	0.5177
DLOG(FDIM)	0.595704	1.196244	0.497979	0.6242
DLOG(FDIM(-1))	1.960667	1.302103	1.505770	0.1486
DLOG(FDIM(-2))	0.805713	1.305622	0.617111	0.5445
DLOG(FDIS)	1.739972	0.993251	1.751794	0.0959
DLOG(FDIS(-1))	0.516790	0.968611	0.533537	0.5998
DLOG(FDIS(-2))	0.175948	0.801292	0.219581	0.8285
D(OPN)	-0.053102	0.061758	-0.859831	0.4006
D(OPN(-1))	-0.091004	0.095858	-0.949368	0.3544
D(OPN(-2))	-0.077053	0.067832	-1.135948	0.2701
D(EXR)	0.004142	0.026998	0.153433	0.8797
D(EXR(-1))	-0.013633	0.031982	-0.426277	0.6747
D(EXR(-2))	0.064996	0.030819	2.108980	0.0484

ECM(-1)	-0.270621	0.094972	-2.849478	0.0103

(iii) Parsimonious ECM of the Model

The result of ECM estimation of the Model is obtainable in Table 5.

Table 5: Parsimonious ECM Estimation Results for Model

Dependent Variable: D(PVT)
Method: Least Squares
Sample (adjusted): 1984 2021
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.468544	0.438904	-1.067534	0.2948
D(PVT(-1))	0.845441	0.108412	7.798410	0.0000
DLOG(FDIA)	-1.701324	0.657524	-2.587472	0.0152
DLOG(FDIA(-1))	-0.485827	0.478838	-1.014595	0.3190
DLOG(FDIM(-1))	1.605765	0.868746	1.848371	0.0751
DLOG(FDIS)	1.529132	0.636170	2.403655	0.0231
D(OPN)	-0.035025	0.041568	-0.842587	0.4066
D(OPN(-2))	-0.055491	0.047949	-1.157308	0.2569
D(EXR(-2))	0.048906	0.020933	2.336307	0.0269
ECM(-1)	-0.598466	0.164333	-3.641789	0.0008

Table 5. parsimonious error correction procedure reveals that the model's explanatory variables accounted for 66% of the variance in Nigerian poverty (as shown by an Adjusted-R2 value of 0.656200), while the error term accounted for 34%. At the 5% level of significance, the entire regression is significant since the F-statistic of 8.846739 is higher than the essential F-statistic value of 2.64. That the model holds water and the independent variables play a key role in explaining the dependent variable is what this means. The model's variables exhibit low levels of serial autocorrelation, as shown by the Durbin Watson Statistic of 2.093160. Additionally, the ECM is properly signed and has a statistically significant value.

(v) Post Estimation Test for the Model

Using the Breusch-Godfrey Serial Correlation LM Test for autocorrelation, the Ramsey Reset Test for linearity, and the Breusch-Pagan-Godfrey Test for heteroscedasticity, the researcher ran a battery of diagnostic tests to establish the series' integrity.

Table 6. Ramsey Reset Test, Serial Correlation LM Test and Homoscedasticity Test Results for Model

	F-Statistic	Prob. Value
Linearity Test (Ramsey RESET Test)	0.635871	0.4322
Breusch-Godfrey Serial Correlation LM Test	0.103337	0.9022
Breusch-Pagan-Godfrey Heteroskedasticity Test	0.363380	0.9430

Source: *Author's Computation (2023)*

Table 6 displays the results of the autocorrelation test that was conducted using the Breusch-Godfrey Serial Correlation LM technique. The F-statistic was 0.103337 and the Chi-Square probability value was 0.9022. With a probability value of almost 90% (0.9022) being more than 5% ($p > 0.05$), this proved that the model did not include any serial correlation.

4. Discussion

4.1 Foreign Direct Investment into Agriculture Sector and Poverty Rate in Nigeria

H1: FDI into agriculture sector cannot reduce poverty in Nigeria

Foreign Direct Investment into the Agriculture Sector (FDIA) Decreases Poverty Rate (PVT), According to the ECM Findings. This indicates that, for the time being considered, the Poverty Rate (PVT) in Nigeria is temporarily decreased for every unit increase in Foreign Direct Investment into the Agriculture Sector (FDIA). There is a statistically significant relationship between the Poverty

Rate (PVT) and Foreign Direct Investment into the Agriculture Sector (FDIA) in Nigeria during the research period. Foreign Direct Investment (FDIA) in the Agriculture Sector Lowers Poverty in Nigeria. Therefore, the research does not reject the alternative hypothesis within the study period, but **it does reject the null hypothesis**, which states that there is no significant link between Foreign Direct Investment into the Agriculture Sector (FDIA) and Poverty Rate (PVT) in Nigeria. Previous research shown that FDIA boosts the economy and lowers poverty (Sikandar et al., 2021); our results corroborate their findings.

4.2 Foreign Direct Investment into Manufacturing Sector and Poverty Rate in Nigeria
H2: FDI into manufacturing sector cannot reduce poverty in Nigeria
The research shows that FDIM (Foreign Direct Investment in the Manufacturing Sector) lowers the poverty rate. As a result, throughout the time period under consideration, the Poverty Rate (PVT) in Nigeria rises for every one-unit increase in Foreign Direct Investment into the Manufacturing Sector (FDIM). During the time frame of the research, the coefficient of FDIM in Nigeria's manufacturing sector was not statistically significant at 5% when compared to the country's poverty rate (PVT). Foreign direct investment (FDI) into Nigeria's manufacturing sector (FDIA) and the country's poverty rate (PVT) were not significantly related during the research period, **so the study accepts the null hypothesis**. Therefore, FDIM (Foreign Direct Investment) in Nigeria's manufacturing sector is a poverty-inducing policy.

While it would be reasonable to assume that FDIM would have a detrimental effect on poverty, this research finds the opposite to be true. One possible explanation for the beneficial impact of FDIM on poverty reduction in Nigeria is that the majority of FDI in the country goes into the oil industry, which employs a negligible percentage of the population. This suggests that FDIM in the manufacturing sector may be the driving force behind this trend. Our research shows that the communication industry has undergone a shift in foreign direct investment (FDI), but that this shift has not yet produced the desired results.

4.3 Foreign Direct Investment into Services Sector and Poverty Rate in Nigeria
H3: FDI into service sector cannot reduce poverty in Nigeria
A favorable relationship between the poverty rate and foreign direct investment in the service sector (FDIS) was found in the research. This indicates that, during the time frame of this assessment, the Poverty Rate (PVT) in Nigeria rises in the short term for every unit increase in Foreign Direct Investment into the Service Sector (FDIS). Within the time frame of the analysis, there is a statistically significant correlation between the Foreign Direct Investment into the Service Sector (FDIS) and the Poverty Rate (PVT) in Nigeria at 5%. Thus, **the result is rejected H3** there is a substantial association between FDIS and Nigeria's poverty rate (PVT) throughout the study period. To put it another way, FDIS (Foreign Direct Investment in the Service Sector) makes Nigerians poorer.

Contrary to expectations, this research finds a positive and statistically significant association between poverty and foreign direct investment (FDIS) in the service sector. Since the majority of Nigeria's foreign direct investment (FDI) goes into the oil industry, which only employs a small fraction of the population, it stands to reason that FDI into the service sector has a positive and statistically significant impact on the poverty rate (PVT). Our research shows that the beneficial effects of redirecting FDI to the communication industry have not yet materialized.

Trade Openness and Poverty Rate in Nigeria
Trade openness (OPN) hinders efforts to alleviate poverty, according to the research. The short-term impact on Nigeria's poverty rate (PVT) throughout the time period under consideration is a unit rise in Trade Openness (OPN) resulting in a lower PVT. At the 5% level of significance, the trade openness (OPN) coefficient does not differ significantly from the poverty rate (PVT) in Nigeria during the research period. Since no statistically significant correlation was found between Nigeria's trade openness (OPN) and poverty rate (PVT) during the research period, the study concludes that the null hypothesis is correct. This indicates that OPN has little effect on poverty levels in Nigeria.

Previous research found that Trade Openness (OPN) reduces poverty. Although a negative correlation between trade openness (OPN) and poverty is predicted, this analysis finds no such correlation. The fact that the underlying dynamics of trade have not yet improved the living

standards of Nigerians might explain why trade openness (OPN) has not reduced the poverty rate (PVT) in the country. The reason for this is the country's economic structure, namely its exports, which are heavily influenced by the oil industry, even though it only employs a small fraction of the workforce. In light of this new information, it is important to examine Nigeria's trade policies and framework to see whether they prioritize economic growth over the well-being of their people.

Exchange Rate and Poverty Rate in Nigeria
According to the research, the relationship between Exchange Rate (EXR) and Poverty Rate (PVT) is favorable. The Poverty Rate (PVT) in Nigeria is raised by one unit rise in the Exchange Rate (EXR) throughout the time period being considered. Between the study's time frame and Nigeria's poverty rate (PVT), the exchange rate (EXR) coefficient is 5% and statistically significant. The analysis concludes that the exchange rate (EXR) and poverty rate (PVT) in Nigeria are significantly related, rejecting the null hypothesis but leaving the alternative hypothesis unrejected for the time being. So, the Exchange Rate (EXR) is a factor that makes Nigerians poorer.

Contrary to popular belief, this research finds a positive and statistically significant correlation between Exchange Rate (EXR) and poverty. The monoculture basis of the Nigerian economy may explain the positive and considerable influence of the exchange rate (EXR) on the poverty rate (PVT). Exports would increase, leading to economic growth and poverty reduction in Nigeria, if the government kept to a consistent policy of managing the currency's value, which would prevent the Naira from being over-or under-valued. This policy would also make sure that tradable goods are competitive, that prices are relatively stable, and that there are no inconsistent fiscal policies.

5. Conclusion
Using yearly time series data spanning 41 years, from 1981 to 2021, the research empirically evaluates the influence of FDI on poverty in Nigeria. Using secondary sources, descriptive statistics, unit root test, and ECM modelling techniques were employed to analyze the data, with poverty rate (PVT) serving as the dependent variable and foreign direct investment (FDI) into agriculture (FDIA), manufacturing (FDIM), service (FDIS), trade openness (OPN), and exchange rate (EXR) serving as the independent variables. Foreign Direct Investment (FDI) in the agriculture sector decreases the poverty rate, FDIM in the manufacturing sector increases the poverty rate, FDIS in the service sector increases the poverty rate, OPN decreases the poverty rate, and EXR increases the poverty rate in Nigeria, according to the ECM. Foreign direct investment (FDI) did not alleviate poverty in Nigeria during the research period, the study found.

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