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Establishing the Nexus between Foreign Direct Investment and Sustainable Economic Growth in Nigeria

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Abstract
The volume of foreign direct investment (FDI) contributing to capital formation and the development process in emerging economies has grown significantly in recent decades. Despite this trend, debates persist regarding the impact of FDI on the long-term economic sustainability of host nations. This study explored the relationship between FDI and sustainable economic growth in Nigeria over the period from 1986 to 2023. Sustainable economic growth was represented by the Human Development Index (HDI), while FDI inflows served as the independent variable. Data for the analysis were sourced from the Central Bank of Nigeria (CBN) statistical bulletin and the World Development Indicators (WDI). Using the autoregressive distributed lag (ARDL) model, findings revealed that FDI had a negative and statistically insignificant impact on HDI. It was, therefore, recommended that FDI inflows should be adequately monitored for the implementation of the need in which it was demanded.

Keywords: *Sustainable economic growth, foreign direct investment, gross domestic product, central bank of Nigeria, autoregressive distributed lag, Nigeria*

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I. Introduction

In most developing economies, Nigeria's inclusive, foreign direct investments (FDI) are supplementary finance options and capital formation mediums aimed at fostering sustainable economic growth. Sustainable economic growth refers to satisfying human needs in such a way that natural resources and the future of the next generations are sustained. Oyegoke and Aras (2021) opined that FDI is considered the most important medium of finance and capital formation. To further establish the importance of FDI in any developing economy, the United Nations Conference on Trade and Development (UNCTAD) believes that FDI aids in improving technological transfer and technical know-how, all of which is required for the speedy accomplishment of sustainable development goals. Furthermore, Gnangnon (2018), Friday, Ebes, and Grietjie (2020) suggested that international flows such as FDI, foreign aid, and trade openness are important tools for sustainable economic growth. Therefore, FDI is anticipated to promote sustainable economic growth not only through the infusion of foreign capital but also by enhancing domestic investment activities.

The need for FDI, especially in developing countries, is borne out of the recent increase in capital inflows across different economies, especially in Africa because of globalization and trade relations. FDI is, therefore, needed by most developing economies in order to keep the pace of development. Furthermore, Babatunde, *et al.*

(2020) believe that due to the effect of globalization, most investors seek higher rates of return for their investments and they resolve to invest in other economies outside their home countries. Also, another fundamental reason for increase in the FDI in most developing economies is because of the trade liberalization and trade restriction removal by most governments (Adediran, *et al.*, 2019). Thus, FDI is considered to be less prone to crisis because investors have a better understanding of the dynamics of the economy in which they want to invest. It is also believed that FDI brings the capital needed for sustainable growth, especially in developing countries; it brings about new technologies, marketing techniques, and technical managerial skills (Amoo, 2018).

The Nigerian government has given much attention to FDI because of its importance. Thus, successive governments in Nigeria have made several efforts at attracting high FDI through various strategies like the introduction of the structural adjustment programme (SAP) in 1986. However, it is believed that, if a country can get more FDI; it could result in a bigger portion that would accrue from global production and income (Lall, 1983; Guraks, 2003). Oyegoke and Aras (2021) stated that Nigeria is the first host country for FDI attraction in Sub-Saharan Africa and occupies a third in the continent. In the recent period, Nigeria has witnessed several trade policies that are aimed at diversifying the economy from its dominance of crude oil. These policies are equally aimed at bringing focus on the improvement of the industrial sector, agricultural sector, and service sector so as to foster real economic growth and not just an increase in the total monetary value of goods and services provided in the country. In a similar manner, FDI is considered an important tool for multinational corporations (MNCs) involvement in producing persisting and widening economic growth in developing economies.

A limited body of literature has examined the impact of FDI on host countries, while many economic policymakers continue to highlight its advantages for both the host and investing nations (Joo et al., 2021; Saurav et al., 2020). According to the Central Bank of Nigeria (CBN) Statistical Bulletin (2020), FDI inflows into the Nigerian economy have exhibited fluctuations relative to actual economic growth. For instance, Nigeria received approximately $1.9 billion in FDI in 2018, a decline from the $3.5 billion recorded in 2017. This reduction may be attributed to the austerity measures implemented by the Nigerian government in 2018. Furthermore, in the third quarter of 2019, FDI stood at $200.08 million, representing just 3.37% of the total capital inflow for that period (CBN, 2020).

It is generally believed that FDI should enhance the economic growth of recipient countries. This expectation drives many developing nations to actively seek foreign investors in hopes of boosting and diversifying their foreign investment portfolios. However, Oyegoke and Aras (2021) noted that FDI performance in Nigeria has remained weak, possibly due to the country's fragile macroeconomic structure. The level of FDI attracted by any country is largely determined by factors such as market size, availability of skilled labor, and a stable macroeconomic environment—elements shaped by both push and pull dynamics. According to Akanegbu and Chizea (2017), the positive but statistically insignificant effect of FDI on Nigeria's output reflects its underwhelming contribution to economic growth.

However, due to the possible variations in how FDI influences economic growth across different contexts, there is a need for country-specific analyses. In response, this study presents fresh insights by focusing on a major recipient of FDI using a rigorous methodological approach. Unlike many previous studies, it also incorporates indicators of sustainable economic growth—such as the long-term real GDP growth rate—and includes the Human Development Index (HDI) to assess the role of FDI in reducing poverty, a subsector of sustainable economic growth.

This study, therefore, explores the relationship between foreign direct investment (FDI) and sustainable economic growth in Nigeria over the period from 1986 to 2023. Specifically, it analyzes the impact of FDI on the Human Development Index (HDI) in Nigeria and examines the direction of causality between FDI and indicators of sustainable economic growth in the country.

The structure of the study is arranged as follows: Section 2 presents a review of relevant empirical literature. Section 3 outlines the research methodology. Section 4 focuses on the discussion of results, while Section 5 concludes the study and provides recommendations.

II. Literature Review

2.1 Conceptual Literature

2.1.1 Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) refers to cross-border investment made by an entity based in one country with the aim of establishing a long-term interest in a business operating in another country. Tadaro (1999) describes FDI as investment carried out by large multinational corporations headquartered in developed countries. Amadi (2002) considers FDI to be a defining characteristic of multinational enterprises, emphasizing that it goes beyond merely transferring capital internationally. Instead, as Root (1984) explains, FDI represents the expansion of a business from its country of origin and involves the transfer of capital, technology, and entrepreneurial expertise to the host country, where these inputs are integrated with local resources for the production of goods

for both domestic consumption and export.

Mwilima (2003) defines Foreign Direct Investment (FDI) as an investment aimed at securing a lasting management interest—typically involving at least 10% of voting rights—and acquiring at least 10% ownership in a company operating outside the investor's home country. Similarly, the International Monetary Fund (IMF, 1999) emphasizes that FDI reflects a long-term interest and sustained control by a foreign investor or parent company in a business located in another economy. Mallampally and Sauvant (1999) further describe FDI as the investment activities of multinational corporations in foreign nations to gain control over assets and oversee production operations. Ayanwale (2007) expands this definition by noting that owning at least 10% of the ordinary voting shares establishes a direct investment relationship, whereas ownership below this threshold is considered portfolio investment. FDI encompasses more than just new investments and mergers or acquisitions—it also includes reinvested earnings, inter-company loans, and other forms of capital transfer between parent companies and their subsidiaries. Ikiara (2003) adds that foreign companies may permit local firms to access their technology if it grants them strategic benefits within the host country, such as access to local expertise or market advantages. This technological transfer and learning are crucial for developing nations like Nigeria in their pursuit of sustainable economic growth.

Foreign direct investment (FDI) refers to investments made by individuals or companies in foreign countries through the establishment or acquisition of business activities there. FDI serves as an essential additional resource that countries require to foster economic growth. It combines elements such as technology, marketing, capital, and management expertise. FDI offers access to new markets, distribution channels, advanced technologies, skills, products, as well as financial and production infrastructures. It can be viewed as a form of foreign investment that contributes to a rapidly growing share of a country's GDP. Many developing and developed nations have adopted policies to attract FDI. Beyond capital accumulation, FDI inflows can generate employment, facilitate technology transfer, and enhance competitiveness (Adams, 2009; Kobrin, 2005; Friday et al., 2020). However, as noted by Akinlo (2004) and Adams (2009), the benefits of FDI for growth and poverty alleviation are not uniform. For FDI to positively impact a host country, its financial markets must reach a certain level of maturity (Friday et al., 2020). Additionally, favorable economic and technological conditions are necessary for FDI to contribute meaningfully to the host economy.

2.1.2 Economic Growth

Economic growth is a relative concept and has been interpreted in various ways by scholars. For instance, Todaro and Smith (2003) define economic growth as the enhanced capacity of an economy to produce goods and services over time, reflecting a positive change in production levels between periods, along with an improvement in the standard of living and overall societal well-being. Similarly, Jhingan (2007) describes economic growth as a sustained rise in a country's per capita output or income, which is typically accompanied by increases in the labor force, consumption, and trade volume.

The author also identifies structural and technological changes as key determinants of growth. Kindleberger (1956), cited by Okpe (2013), defines economic growth as an increase in production without changes in technical or institutional arrangements. These arrangements refer to the methods and systems used to achieve higher production. Okpe (2013) further describes economic growth as a process where a country's per capita income consistently rises over an extended period. Friedman (1958) views economic growth as the expansion of systems such as education, agriculture, transportation, and institutions, occurring without altering the social system's structure. Thus, economic growth involves expansion rather than structural changes. Additionally, foreign direct investment and sustainable economic growth are influenced by a range of social, political, economic, and institutional factors.

2.1.3 Foreign Direct Investment and Sustainable Economic Growth

Economic growth is influenced by a range of social, political, economic, and institutional factors. The relationship between FDI and economic growth has gained significant attention in the expanding body of literature, exploring various aspects of this connection. Overall, these studies highlight multiple dimensions, including foundational FDI theories, the impact of various macroeconomic variables on FDI, the role of economic integration in FDI flows, and the benefits and drawbacks of FDI (Yusop, 1992; Cheng and Kwan, 2000; Lim, 2000).

Gohou and Soumare (2012) believed that FDI can aid sustainable economic growth through indirect channels. Poverty can be drastically reduced to its minimum through the direct channel, through the creation of jobs in the private sectors of the economy, and the provision of social welfare for the poor. Good jobs can help in knowledge transfer through the employment of FDI in host countries (Javorcik, 2015). These quality jobs can directly help reduce poverty, while the skills and knowledge acquired can contribute to generating additional employment opportunities. Additionally, indirectly, FDI can encourage domestic investment and capital accumulation, thereby promoting economic growth (Gohou and Soumare, 2012). It is generally hoped that such

economic growth will remain sustainable and will be seen in other variables of economic growth like poverty reduction, high standard of living, low cost of living, availability of social amenities, and strong institutions. According to Magombeyi and Odhiambo (2017), FDI can aid sustainable economic growth in both the short-run and long-run and this suggests that quality institutions are built in the financial system that will further help the intermediation functions of the financial institution for sustainable economic growth.

2.0 **Theoretical Framework**

2.2.1 Eclectic Paradigm to Foreign Direct Investment

Dunning (2007) developed the eclectic paradigm theory of foreign direct investment, building upon his earlier works (Dunning 1977 and 1979), by integrating key imperfect market-based theories such as oligopolistic and internalization theories. He further expanded the framework by adding a third element—location theory—to explain why many multinational corporations establish subsidiary branches in specific locations.

Location theory addresses key questions about who produces specific goods or services, where they are produced, and the reasons behind these choices. Researchers frequently use this theory to explore the factors influencing the geographic placement of multinational corporation (MNC) units. Some of the major factors identified include host country policies, the strength of the local economy, corporate strategies, and the benefits of agglomeration economies. Dunning (1993) presented this theory, known as the eclectic paradigm or the OLI paradigm, based on the foregoing. The theory also suggested that a company that intends to use foreign direct investments in other countries would have an advantage of ownership compared to other companies in that country and internalizes these advantages.

Claudia, Dinora, and Mohamed (2020) opined that there was no need to alter the assumptions of the OLI theory as it captures a more specific factor that influences the location aspect of FDI. Pathan (2017) tested the eclectic theory and discovered that the ownership aspect of the theory has a significant effect on FDI inflows while the location aspect of the theory encourages trade- oriented FDI inflows. The OLI theory is vital to the Nigerian economy because of the significant role it plays in the determination of the flow of direct investment and this is what the study is all about.

2.1 Empirical Review

Iheanachor and Ozgbe (2021) examined the impact of foreign direct investment (FDI) inflows on the sustainable development of Nigeria and Ghana from 2000 to 2018. They applied the ordinary least squares (OLS) method to analyze variables including real GDP, FDI inflows, gross fixed capital formation, environmental sustainability (measured by carbon dioxide emissions), and social development (measured by government spending on health and education). Their findings indicated that Ghana outperformed Nigeria in terms of social sustainability, while Nigeria surpassed Ghana in environmental and economic sustainability. Additionally, the study revealed a positive and significant correlation between FDI and economic growth in both countries.

Joo et al. (2021) explore the role of foreign direct investment (FDI) in driving economic growth in the BRICS countries, Brazil, Russia, India, China, and South Africa. Their findings emphasise that FDI alone does not guarantee economic development unless it is supported by enabling conditions within the host country. The authors utilise a dynamic panel data analysis, applying the Generalised Method of Moments (GMM) to address endogeneity concerns. Financial development emerges as a significant moderator, with well-functioning financial markets enhancing the growth effects of FDI. Likewise, trade openness is identified as a key facilitator, enabling better integration of foreign capital into productive sectors. The study also underscores the importance of human capital, as a more skilled workforce is better equipped to absorb technological and managerial know-how from foreign investors. However, macroeconomic instability, particularly inflation can dilute the benefits of FDI by creating an unfavourable investment climate. The study argue that policymakers must adopt a holistic view that pairs FDI attraction with structural reforms in finance, education, and governance. Rather than viewing FDI as inherently beneficial, the study positions it as conditionally effective. This perspective contributes to the literature by highlighting the interactive nature of external investment and domestic readiness. While the study is focused on BRICS countries, its implications can inform broader policy discourse in emerging markets. Future research is encouraged to test these interaction effects in lower-income economies to enhance the applicability of the findings.

Oyagoke and Aras (2021) conducted a study using Nigeria as a case study to assess the influence of foreign direct investment (FDI) on the economic growth of both the investing and host countries. Covering the period from 1970 to 2019, the study analyzed data on Gross Domestic Product, FDI inflows, and FDI outflows. Employing the least squares estimation method, the findings revealed that FDI inflows had a positive and significant impact on Nigeria's economic growth, while FDI outflows exerted a negative but statistically insignificant effect.

Akanegbu and Chizea (2017), in an earlier study on the effect of foreign direct investment (FDI) on Nigeria’s economic growth, applied the ordinary least squares (OLS) technique to data spanning from 1991 to 2014. Their results indicated that while FDI had a positive influence on production output, the effect was not

statistically significant. Similarly, Sabuur and Ismaila (2020) investigated the relationship between FDI and economic growth in Nigeria over the period from 1981 to 2018. The study used the least- squares technique to measure the variables of direct foreign investments such as the participation of Gross Domestic Product (GDP), Human Capital, Royal GDP, consumer price index, public spending, population growth, and expenses for the consumption of per capita families. In the study, it was discovered that FDI has been an important and significant factor over time in the growth process of the Nigerian economy.

Aminu (2020) examined the impact of foreign direct investment on Nigeria's economic growth trajectory. The study utilized secondary time series data covering a 30-year period from 1989 to 2019, focusing on variables such as FDI inflows, gross domestic product (GDP), and domestic investment. Using the autoregressive distributed lag (ARDL) model, the analysis revealed no long-run relationship among the variables included. Additionally, the findings showed that domestic investment significantly influenced GDP, whereas FDI did not have a statistically significant effect on Nigeria's economic growth.

Babatunde *et al.* (2020) explored the impact of foreign direct investment (FDI) on the growth of Nigeria's real sector and how external capital inflows could support the achievement of Sustainable Development Goal 17. The study utilized variables such as gross domestic product (GDP), FDI inflows into the industrial sector, capital stock, and labor input. Applying the generalized method of moments (GMM), the findings revealed that labor quality had a significant and positive effect on real GDP, whereas capital intensity showed a significant negative effect. Similarly, Friday, Ebes, and Gietjie (2020) assessed the influence of foreign investment, foreign aid, and trade on poverty reduction in selected African countries between 1990 and 2017 using the feasible generalized least squares (FGLS) method. Their results indicated that both FDI and foreign aid had a significantly negative impact on poverty alleviation in the countries studied.

In the study, if it enclosed that the African economies composed of the empress with high-level Écic values to experience the most significant entry than those that are lacking it. Trang *et.al.* (2019) proposed additional and quantitative advice on the impact of the FDI on economic growth for 30 developing countries. A short and long impact of this effect run concurrently for a period of time 2000 to 2014. The study used Error Vector Correction Model with OLS completely modifies and discovered that FDI helped stimulate long-term economic growth. However, FDI negatively affects economic growth with a short plaque. Tran and Hoang (2019) investigated the impact of foreign direct investment (FDI), domestic investment, human capital, and the proportion of trained workers on economic growth in Vietnam. Using annual data spanning from 2012 to 2015 and applying panel regression analysis, the study found that FDI, domestic investment, and human resources had a positive and statistically significant influence on GDP. However, the proportion of trained workers did not show any significant effect on economic growth. Similarly, Hanafy and Marktanner (2018) analyzed the influence of both aggregate and sector-specific FDI on Egypt's economic growth between 1992 and 2007. Utilizing the generalized method of moments (GMM), the study concluded that neither total FDI nor sectoral FDI had a direct, unconditional impact on economic growth.

Saurav et al. (2020) present a comprehensive review of empirical studies assessing the relationship between FDI and employment outcomes in developing countries. Their report synthesises over one hundred studies, providing insight into how FDI affects job creation and wages both directly and indirectly. A key observation is that foreign firms tend to offer higher wages and better employment conditions than domestic firms (Saurav et al., 2020). However, the extent of these benefits varies widely across sectors and countries, and often disproportionately favours skilled workers. This creates a potential risk of widening income inequality in the absence of inclusive labour market policies. The review also highlights that knowledge spillovers to local firms are not automatic, but are dependent on the host country's absorptive capacity and labour mobility. The authors note that FDI tends to be most effective in manufacturing and export-oriented sectors, where competition and exposure to international standards drive better performance. To maximise employment benefits, the study recommends that governments implement training programmes, enforce fair labour practices, and invest in educational reform. It also stresses the importance of aligning FDI strategies with broader development goals. While the review provides a solid foundation, it acknowledges limitations, such as limited evidence on the informal sector and gender-specific outcomes (Saurav et al., 2020). Overall, the study offers a nuanced understanding of how FDI can contribute to job growth and wage enhancement when supported by sound policy frameworks. Its conclusions serve as a guide for countries aiming to use FDI as a tool for inclusive economic development.

In a study focused on Cambodia's economy, Sokang (2018) used annual time series data from 2006 to 2016 and concluded that FDI inflows contributed positively to economic growth. This finding aligns with the results of Gudaro, Chhapra, and Sheikh (2012), who examined the impact of FDI on Pakistan's economic growth over the period from 1981 to 2010. Similarly, Jorge and Richard (2018) explored the role of foreign direct investment in driving economic growth in Spain between 1984 and 2010. Their analysis included variables such as nominal GDP, FDI inflows, credit, bank lending to Spain, a commodities index including oil prices, exchange rates, money supply, interbank interest rates, and the total GDP of G7 nations. Using the autoregressive distributed

lag (ARDL) model for data analysis, the study found that although FDI increased significantly during the period, there was no clear evidence linking it to economic growth in Spain.

III. Methodology

The study utilizes annual time series data spanning from 1986 to 2023. The selection of 1986 as the starting point is due to the implementation of the Structural Adjustment Programme in Nigeria during that year. Data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Bank Development Indicators. The variables included in the analysis are real gross domestic product (GDP), human development index (HDI), foreign direct investment (FDI) inflows, gross domestic investment, trade openness, total debt service payments, inflation rate, and exchange rate.

3.1 Model Specification

The model specified in the study is in line with the Cobb-Douglas function and the model was modified from the studies of Fosu and Magnus (2006) and Uwubanmwen and Ogiemudia (2016).

$$gyHDI_t = g_A + \beta_1 FDI_t + \beta_2 TO_t + \beta_3 TDS_t + \beta_4 INF_t + \beta_5 EXCH_t + \mu_t \quad (2)$$

) Where;
gyHDI is the elasticity of the human development index
FDI is the foreign direct investment
TO is trade openness
TDS is the total debt service payment
INF is the inflation rate EXCH is the exchange rate
g_A, β_1, β_2, β_3, β_4, and β_5 are parameters to be estimated
μ_t is the error term.
The Autoregressive Distributed Lag (ARDL) approach was used for data analysis following appropriate diagnostic tests for unit root and cointegration. Additionally, the study identified the causal relationship between foreign direct investment and indicators of sustainable economic growth.

IV. Analysis and Interpretation of Results

The descriptive statistics of the data used in the study were first examined and the result is presented in Table 1.

Table 1: Summary of Descriptive Statistics

	HDI	FDI_GDP	TDS_GDP	EXCH	INF	TO
Mean	0.454	1.614	2.526	123.387	19.775	0.320
Median	0.458	1.412	1.764	123.401	12.100	0.332
Maximum	0.539	5.790	6.521	410.701	76.758	0.555
Minimum	0.370	0.195	0.103	2.02057	0.2236	0.075
Std. Dev.	0.054	1.261	2.070	110.006	18.174	0.102

Source: Researchers' Computation, 2024.

The human development index produced an average value of 0.45 while the maximum HDI was 0.539. On the minimum, HDI produced a value of 0.370 while its standard deviation value (0.054) is found to be lesser than the average value and that indicates the absence of volatility in the human development index series. The ratio of foreign direct investment to Nigeria's gross domestic product averaged 1.614, indicating that approximately 1.614 units of FDI are incorporated into the country's GDP. Additionally, the average ratio of total debt service to GDP was 2.526, with a maximum value reaching 6.521. Regarding the exchange rate, the average stood at ₦123.39 per U.S. dollar, closely matching the median value. Nigeria's inflation rate averaged 19.77 percent, with a high of 76.75 percent and a low of 0.22 percent. Trade openness, measured as the ratio of total trade to GDP, had an average value of 0.320, suggesting that a significant portion of Nigeria's trade openness is reflected in the total value of goods and services produced within the country.

In Table 2, the correlational relationship between the variables is presented.

Table 2: Correlational Matrix

Probability	HDI	FDI_GDP	TDS_GDP	EXCH	INF	TO
HDI	1.0000					
	- - -					
FDI_GDP	-0.3194	1.0000				

	0.0575	-----				
TDS_GDP	-0.7448	0.3675	1.0000			
	0.0000	0.0274	-----			
EXCH	0.8678	-0.3815	-0.6422	1.0000		
	0.0000	0.0217	0.0000	-----		
INF	-0.3919	0.5480	0.5805	-0.3690	1.0000	
	0.0181	0.0005	0.0002	0.0268	-----	
TO	-0.1216	0.0691	0.0796	-0.2311	-0.1210	1.0000
	0.4797	0.6887	0.6443	0.1750	0.4820	-----

Source: Researchers' Computation, 2024.

The human development index shows a negative correlation with the ratios of foreign direct investment to GDP, total debt service payments to GDP, the inflation rate, and trade openness. Conversely, it has a positive correlation with the exchange rate, which is strong, positive, and statistically significant. Additionally, the correlation between foreign direct investment as a ratio of GDP is positive but weak, though significant. The relationship between the exchange rate and foreign direct investment as a ratio of GDP is weak, negative, and significant. Inflation and trade openness both have a positive correlation with foreign direct investment relative to GDP.

Total debt service payment has a strong but negative and statistically significant correlation with exchange rate while it is positive with inflation and trade openness. The exchange rate and the inflation rate have a negative, weak, and significant correlation coefficient. The same correlational relationship is found between exchange rate and trade openness too but it is not significant. Inflation rate and trade openness is found to have a correlation coefficient of 0.1210 and this implies that there is a weak, negative, and statistically not significant correlation.

Unit Root Tests

A key feature of time series data is the potential presence of a unit root. Consequently, this study tests the variables for unit root presence using the Augmented Dickey-Fuller test. The results are shown in Table 4.3.

Table 3: Summary of Augmented Dickey-Fuller Unit Root Test

	Level				First Difference			
Var	t-test	Cri-val	Prob	Var	t-test	Cri-val	Prob	Stationarity
HDI	-0.76	-2.95	0.8177	HDI	-6.54	-2.95	0.0000	I(1)
FDI/GDP	3.82	-2.95	0.0062	-	-	-	-	I(0)
TDS/GDP	-1.82	2.95	0.3655	TDS/GDP	-6.94	-2.95	0.0000	I(1)
EXCH	2.44	-2.95	1.0000	EXCH	-3.65	-2.95	0.0098	I(1)
INF	-2.85	-2.95	0.0623	INF	-5.60	-2.95	0.0000	I(1)
TO	-3.40	-2.95	0.0176	-	-	-	-	I(0)

Source: Researchers' Computation, 2024.

The results of the Augmented Dickey-Fuller (ADF) unit root test indicated that the variables exhibit varying degrees of stationarity. Specifically, foreign direct investment as a ratio of gross domestic product and trade openness are stationary at their levels, whereas the human development index, total debt service payment as a percentage of gross domestic product, exchange rate, and inflation rate become stationary only after first differencing. As a result of the mixed stationarity in the variables between level and first difference, the study's two models adopt the Autoregressive Distributed Lag method of data analysis.

However, it is important that the lag length criteria be established so as to understand at what lag is the regression equation optimized. The study, therefore, employs the Vector Autoregression (VAR) lag length criteria. The results of the VAR lag length criteria are presented in Table 4.

Table 4: Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-338.8358	NA	25.97919	20.28446	20.55381	20.37632
1	-231.2482	170.8744*	0.399309*	16.07342*	17.95892*	16.71643*
2	-200.9782	37.39223	0.689863	16.41049	19.91214	17.60465

Source: Researchers' Computation, 2024.

The AIC produces a minimum value of 16.07342 at lag 1 while SC produces a minimum value of 17.95892 at lag 1 also. Furthermore, other criteria established that model 2 is the best fit at lag 1.

3.1 Presentation of Result

The study aimed at investigating the relationship between the human development index and foreign direct investment in Nigeria. The ARDL test is employed to establish this relationship because of the mixture of variables stationarity between level and first difference. The result is presented in Table 5

Table 5: Relationship between Human Development Index and Foreign Direct Investment

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
HDI(-1)	0.748450	0.122719	6.098890	0.0000
FDI_GDP	-0.000738	0.002794	-0.264177	0.7936
TDS_GDP	-0.003868	0.002165	-1.787062	0.0852
EXCH	-0.000205	0.000162	-1.267081	0.2159
EXCH(-1)	0.000293	0.000168	1.744400	0.0925
INF	0.000153	0.000219	0.697616	0.4914
TO	-0.023410	0.035184	-0.665345	0.5115
C	0.126003	0.052631	2.394076	0.0239
R-squared	0.925517	Mean dependent var		0.456486
Adjusted R-squared	0.906207	S.D. dependent var		0.053438
S.E. of regression	0.016366	Akaike info criterion		-5.189622
Sum squared resid	0.007232	Schwarz criterion		-4.834114
Log likelihood	98.81839	Hannan-Quinn criter.		-5.066901
F-statistic	47.92844	Durbin-Watson stat		2.063813
Prob(F-statistic)	0.000000			

Source: Researchers' Computation, 2024.

The result revealed that lag 1 human development index has a positive and significant impact on the present period human development index with a coefficient of 0.748450. This implies that an improvement in the human development index has positive potential to increase in the future period. This relationship is found to be statistically significant. However, foreign direct investment is seen to exhibit a negative effect on the human development index with a coefficient of -0.000738. This denotes that there is a minute effect and it is found to be statistically not significant. In a similar manner, total debt service payment has a negative effect on the human development index with a coefficient of -0.003868 and it implies that the higher the debt service payment is, the lower will be the performance of the economy in terms of the human development index.

The coefficients for the exchange rate in the present period and lag 1 period are -0.000205 and 0.000293 which indicate that, in the present period, exchange rate and human development index are negatively related while the relationship is found to be positive with lag 1 exchange rate. These relationships are statistically insignificant. The inflation rate in Nigeria shows a positive but non-significant association with the human development index, and trade openness displays a comparable pattern.

Coefficient of Determination (R^2)

The coefficient of determination is 0.925517, indicating that approximately 92.55 percent of the total variation in the human development index can be explained by changes in foreign direct investment, total debt service payments, exchange rate, inflation rate, and trade openness.

F-Statistics

The F-statistics for the second model revealed a value of 47.92844 with a probability figure of 0.0000 which shows that the independent variables jointly have a significant influence on the human development index.

ARDL Bounds Test

The second objective is also subjected to the long-run ARDL Cointegration test and the result is presented in Table 5

Table 6: Summary of ARDL Bounds Test

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	1.664722	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73

		1%	3.06	4.15

Source: Researchers' Computation, 2024.

The ARDL long-run cointegration test yielded an F-statistic of 1.664722, with upper and lower bound values of 3.38 and 2.39 respectively at the 5% significance level. Since the F-statistic (1.664722) is below the lower bound value (2.39), the null hypothesis of no long-run cointegrating relationship among the variables cannot be rejected. Therefore, the study concludes that there is no long-term cointegration between the human development index, foreign direct investment, total debt service payment, exchange rate, inflation rate, and trade openness.

The study also looked at the causal relationships among the variables employed in the study. The study makes use of the granger causality technique to establish the direction of causality among the variables. The summary is presented in Table 7

Table 7: Summary of Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
HDI does not Granger Cause RGDPGR	34	3.84562	0.0330
RGDPGR does not Granger Cause HDI		0.18953	0.8284
FDI_GDP does not Granger Cause RGDPGR	34	5.70156	0.0082
RGDPGR does not Granger Cause FDI_GDP		2.72593	0.0823
FDI_GDP does not Granger Cause HDI	34	0.06864	0.9338
HDI does not Granger Cause FDI_GDP		2.21731	0.1270

Source: Researchers. Computation, 2024.

The Granger causality test showed a one-way causal relationship between the human development index and the real gross domestic product growth rate, with causality running from the human development index to real GDP growth. Additionally, foreign direct investment as a ratio of GDP also exhibits a one-way causal effect on the real GDP growth rate, with causality flowing from FDI to GDP growth. However, no causal relationship was found between foreign direct investment as a ratio of GDP and the human development index in Nigeria.

3.2 Discussion of Findings

The study found that foreign direct investment negatively affects the human development index, which reflects the overall well-being of the average individual in the economy. This observed relationship between foreign direct investment and the human development index is considered illogical and inconsistent with established theory. Foreign investment should literarily influence the human development index positively. However, this relationship may be caused by the non-channelization of foreign investment into products that are aimed at developing the economy and influencing the overall performance of the population.

The results contradict Sabuur and Ismaila's (2020) findings, which indicated that foreign direct investment negatively affects gross domestic product. However, they align with Dike's (2018) conclusion that a long-run cointegrating relationship exists between foreign direct investment and gross domestic product in Nigeria. Similarly, Olatunji and Shahid (2015) found no long-run cointegrating relationship between foreign direct investment and the human development index.

V. Conclusion and Recommendations

The study investigated the impact of foreign direct investment on the sustainability of the Nigerian economy from the post-structural adjustment programme period up to 2023. Using the Autoregressive Distributed Lag method on both specified models for empirical analysis, the study found that foreign direct investment in Nigeria has contributed to an increase in the human development index. Similarly, the study also found that trade openness has a positive influence on the growth rate of the gross domestic product while it was found to exert a negative effect on the human development index. Finally, on the issue of causality, foreign direct investment and the human development index were found to have no causal relationship. The following recommendations were suggested for policy implementation. Policymakers in the Nigerian economy should enact policies that will monitor the proper execution and implementation of foreign direct investment inflows so that their impact can be significantly felt in the economy. The Nigerian government should embrace the improvement of local industries so as to increase the capacity of Nigerian exports. This will strengthen the exchange rate. Foreign direct investments and other aids received in the economy should be judiciously used in building strong institutions that will be seen in the standard of living of the Nigerian populace.

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