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**DOES FOREIGN DIRECT INVESTMENT REDUCE INCOME INEQUALITY? EMPIRICAL EVIDENCE FROM NIGERIA**

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**ABSTRACT**

Whether FDI reduces income inequality has remained a debate in empirical literature. Following the Sustainable Development Goals (SDGs) 10, this paper investigates the nexus between FDI and income inequality in Nigeria, employing time series data from 1980 to 2022 and the autoregressive distributed lag (ARDL) technique. The study established a cointegrating relationship between the research variables. It also found a positive and significant relationship between FDI and income inequality in the short and long run. That is, income disparity worsens as FDI inflows to Nigeria rise. While education contributed to lowering income inequality in the long run, growth exacerbated it in the short run. Therefore, this study advocated fine-tuning government policy to attract quality FDI, which is job enhancing to Nigeria. Likewise, policymakers should pay more attention to providing quality education to boost the human capital levels in the country.

**Keywords:** FDI, income inequality, ARDL, ECM, growth, Nigeria

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**INTRODUCTION**

Economic growth remains one of the fundamental objectives of every nation particularly developing countries. Majority of economist hold the view that economic growth is accompanied by increase in per capita income, improvement in productivity, lower unemployment rates and improvement in the overall wellbeing of the people. However, achieving this broad objective is difficult for developing economies due to inadequate capital formation as a result of insufficient domestic savings and investment (Abdulkarim, 2023). The rate at which a country is able to mobilize domestic savings determines its rate of economic growth (Ribaj & Mexhuani, 2021). Developing countries could close their savings-investment gap by attracting capita from abroad through foreign direct investment (FDI).

FDI is one of the key drivers of the Nigerian economy in recent years, total receipt is about \$46 billion between 2019 and 2022 (National Bureau of Statistics, 2022).

However, despite this inflow, the poor who constitute the majority of the population have becoming poorer while the few rich are getting richer (Mayah et al., 2017). Solving inequality problems is imperative since rising levels of income inequality can inhibit economic growth by prompting socio-political instability, which could slow down investment, economic growth, and impede on poverty reduction programs in developing economies (Magombeyi & Odhiambo, 2017). Reducing poverty and inequality is one of the sustainable development goals (SDGs) by the United Nations, which urges developing countries to urgently address the problem of inequality and poverty which constitute a major hindrance towards their growth and development agenda (Seven & Coskun, 2016).

There is a growing interest on the effect of FDI on unequal distribution of income; however, results from many studies have remain inconclusive. For instance, Huang et al. (2020) examined 543 primary studies and found out that 222 studies show positive impact of FDI on income inequality, while 321 reveal negative or insignificant impact. The inconsistencies observed in many studies are as a result of several factors that may affect income inequality (Babatunde, 2018). To fully comprehend the nexus between income inequality and FDI researches have incorporate other variables into their models. These includes: globalization (Nwokoye et al., 2019), international trade (Aigheyisi & Osarabo, 2020), Interest rate and exchange rate (Mokuolu, 2018), unemployment rate (Osabohien et al., 2020) and many more. The inconsistent findings from many studies could be as a result of the use of different methodologies, different time periods and the use of panel data (Babatunde, 2018). These contradictory results from the literature suggest the need to further investigate the role of FDI on income inequality, thus prompting the study. Following this section of the paper is section 2 which focuses on providing theoretical underpinning to the study as well as reviewing empirical works related to the subject of research. Section 3 details the method employed in collecting and analysing the data for the study. While the empirical results were reported and discussed in section 4, section 5 concluded the paper with recommendations.

## **THEORETICAL FOUNDATION**

The modernization theory and the dependency and world-systems theory are the two dominant theories used to demonstrate or underpin the implications of foreign direct investment (FDI) for income inequality (Rezk et al., 2022) in any economy.

The modernization theory dates back to the 1950s, and it follows the Ohlin (1933) hypothesis that less developed countries (LDCs) can bridge the gap in income by focusing attention on low-skilled, labour-intensive production. Besides, it is a theory that demonstrates the stages or processes of development in any human society - from the traditional stage to the modern (Rezk et al., 2022). It maintained that the stage of development in society influences the level of income inequality (Rostow, 1990). It identified foreign direct investment (FDI) as the product of economic cooperation

between the developed countries (DCs) and the less developed countries LDCs, which could be leveraged on by LDCs for economic progress.

Moreover, the relationship between FDI and income inequality is consistent with the proposition by Kuznets (1955) that the presence of FDI creates positive spillovers (such as capital flows, skills and technological transfer and export diversification), which initially spur progress in critical sectors of the host economy before spiralling to other sectors and facets which results in the reduction of income inequality.

On the other hand, the dependency and world-systems theory employed the centre-periphery model to describe the relationship between FDI and income inequality (Rezk et al., 2022). It argued that FDI inflows are detrimental to their host economy due to their predatory motive. That is, the multinational corporations (MNCs) headquartered in the DCs only establish their subsidiaries, usually in the LDCs, to exploit cheap labour and other resources in the host economies fully without adding any value.

### **EMPIRICAL REVIEW**

This section of the paper surveys relevant literatures on the subject of the interconnectedness between FDI flows and income inequality which has largely remained debatable amongst authors. In our review, we categorise the literatures on this subject broadly into two strands.

The first strand of literature on FDI-inequality nexus debate are those that reported either direct, inverse, neutral or nonlinear impact. These literatures which are dominated by cross-country studies include:

Ihsan et al. (2023) empirically explored the role of FDI and other related variables in moderating income disparity in 10 Asian countries. Utilising data from 2003 and 2018 along with the fixed effects model, the authors discovered that FDI flows significantly enhanced equitable income distribution in the sampled countries. Using the generalized method of moment (GMM) and data from 2000 to 2015 of 38 sub-Saharan countries to analyse the trade, FDI-income inequality nexus, Xu et al. (2021) documented an inverse relationship between FDI and inequality. That is, the level of income disparity declines with rise in FDI flows.

Further, Rezk et al. (2022) investigated the causal relationship between FDI and inequality in Egypt. Employing annual data from 1975 to 2017, they found that FDI flows is inversely related with income inequality in Egypt. Thus, suggesting that the widening income gap in the country will abate as FDI flows increase. Also, Babatunde (2018) in a study analysed the relation between FDI and inequality in Nigeria applying the ARDL and the nonlinear ARDL model to 36-year (1980-2016) data. The study reported that the interrelationship between FDI flows and inequality is a short-run event. Specifically, each of two models showed that a rise in FDI flows will result to a decline in inequality in the country and contrariwise.

The impact of FDI on the distribution of income was investigated by Adigun and Sadibo (2019). The study which focused on Nigeria and using the vector autoregressive

approach revealed that FDI has small impact on distribution of income. In another study, Osabohien et al. (2020) assessed the effect of FDI on employment in Nigeria relying on the Johansen test for cointegration and the fully modified ordinary least squares (FMOLS). They established a direct relationship among employment and FDI through their result. In other words, the level of employment in the country will rise as the amount of FDI inflows increase.

However, Wang and Lee (2021) in a study that employed panel data of 60 countries between 1998 and 2014 incorporated country risk to examine the FDI-income gap nexus. Their findings showed that FDI worsens or widens the income gap in high-risk countries and vice-versa. Likewise, Song et al. (2021) in a study of 20 important developing economies by share of remittance receipts using panel cointegration method to analyse yearly data between 1980 and 2016 found that a rise in FDI and remittances adversely affects income inequality. Nwokoye et al. (2019) explored the linkage between globalization and income inequality in Nigeria utilising the Johansen cointegration test and the error correction model to analyse quarterly data from 1985 to 2015. Through their findings they corroborated that FDI deepens the income disparity in Nigeria. Again, Aigheyisi and Egbon (2020) examined the influence of FDI on inequality in Nigeria with the interaction of trade. The DOLS estimator was used to analyse annual data between 1981 and 2015. Their findings revealed a direct relationship between FDI and inequality. But found an inverse relationship among the duo when FDI interacts with trade. But then, Teixeira and Loureiro (2019) employing the Johansen cointegration and Granger (non-) causality approach and annualised data from 1973 to 2016 found that FDI flows is not a significant determinant of income inequality in Portugal. That is, FDI flows neither increases nor decreases the income gap.

Nevertheless, Kaulihowa and Adjasi (2017) evaluated the relationship between FDI and inequality using the Pooled Mean Group estimator approach to analyse 33-year (1980 to 2013) data from a sample of 16 countries in Africa. They found a non-linear relationship between FDI and inequality. Hence, establishing that the effect of FDI on income disparity is U-shaped. Equally, Gam et al. (2023) estimated the impact of FDI using the Bayesian method and data from 2008 to 2020 on 36 developing countries. They found that FDI exerted a U-shaped effect on inequality. Also, that the effect on income inequality may vary when FDI interacts with other variables like migration and trade.

The second strand of literature considered the influence of FDI on inequality from the point of governance structure or the nature of institutions in countries and their level of development. Among these studies include:

For instance, the impact of FDI and its interaction with institutional quality was analysed by Huynh (2021) using a sample of 36 countries in Asia from 2000 to 2108. The result of the study revealed that FDI increases income inequality. It however, maintained that this undesirable trend can be reversed in an atmosphere of good and strong institutions. Similarly, Ofori et al. (2021) in their paper revealed that strong institutional or good

governance structures are critical in ensuring that FDI flows from China bridge the income gap in Africa.

What is more, Huang et al. (2020) employ meta-analysis and 543 empirical works between 1995 and 2019 to ascertain the effect of foreign direct investment (FDI) on income inequality. Their result showed that the level of development in the countries of interest is a key determinant of the influence of FDI on inequality. That is, FDI linked with high inequality in low-income countries relative to countries in the middle-income and high-income brackets separately. Equally, Yuldashev et al. (2023) utilising the interactive model documented the adverse effect of FDI on inequality. But they posited that FDI can be beneficial when the level of a country’s human capital is high or developed. On the contrary, Nguyen (2021) in a study of 37 developing nations and 24 advanced countries between 2005 and 2018 using the two-step system GMM found that dissimilarities in governance environment influence the FDI-inequality relation. That is, FDI inflows decreases inequality in third world countries, whereas in the first world countries it exacerbates inequality.

It is apparent from the literature survey that studies on the FDI-income inequality relation have remained largely inconclusive explained by differences in scope and methodologies employed by authors. Further, studies on Nigeria relating to this topical subject appear to be scanty, hence, the rationale for the current study.

**METHODOLOGY**

**Model specification:**

Our baseline model for investigating the nexus between foreign direct investment (FDI) and income inequality in Nigeria is:

$$INQ_t = \beta_0 + \beta_1 FDI_t + \beta_j X_t + \varepsilon_t \tag{1}$$

Where *X* signifies the vector of control variables;  $\varepsilon$  and *t* are individually the residual term and time dimension. The intercept is  $\beta_0$ , whereas the regression coefficients are  $\beta_1$  and  $\beta_j$ .

**Table 1: Variable Description**

Variable	Symbol	Measure	Source	Expectation	Inherited Literature
<b>Dependent variable</b>					
<b>Income inequality</b>	INQ	GINI index	WDI		Song et al. (2021); Khan et al. 2021; Amponsah et al. (2023)
<b>Independent variable</b>					
<b>Foreign direct investment</b>	FDI	FDI net inflows percentage of GDP	WDI	-	Xu et al. (2021); Kaulihowa and Adjasi (2017); Aigheyisi and Egbon (2020)
<b>Control variables</b>					

<b>Gross domestic product</b>	GDP	GDP growth annual percentage	WDI	-	Clark et al. (2011); Bhowmik (2023); Naoaj (2023)
<b>Education</b>	ED	School enrolment, tertiary (% gross)	WDI	+	Huynh (2021)
<b>Inflation</b>	INF	Annual percentage change in consumer prices	WDI	-	Gam et al. (2023); Huynh (2021);
<b>Trade</b>	TRD	Total sum of trade as a share of GDP	WDI	+	Gam et al. (2023); Huynh (2021); Lee et al. (2020); Nguyen (2023)

Source: Authors' compilation

**Data:**

Our study relied on annual time series data from secondary sources such as the World Development Indicator (WDI). Based on data availability, the data transversed 42 years, from 1980 to 2022.

**Estimation method:**

We utilised the Phillips-Perron (PP) unit root test to examine the stationarity properties of our variables before estimation, which we provided in Table 4. It is essential to perform this test as part of standard econometric practice to circumvent estimating spurious regression and producing results unfit for policy recommendations. Our PP unit root test result showed that our variables have different orders of integration, ranging from stationary at level I(0) to first-differenced I(1). Specifically, the stationary variables at the level are INQ, FDI, GDP, INF, and TRD, whereas ED assumed stationarity through first differencing.

Consequently, after running the cointegration test, we estimated our baseline model using the Autoregressive Distributed Lag (ARDL) model developed by Pesaran et al. (2001) to establish a long-run relationship between our variables under study. ARDL is preferred over others because it can simultaneously estimate the model's short-run and long-run coefficients (Busu, 2020). Also, it produces valuable and accurate results (Chandio et al., 2020; Omoke & Opuala-Charles, 2021). Therefore, equation 1 above transforms into:

$$\Delta INQ_t = \beta_0 + \beta_1 FDI_{t-1} + \beta_2 GDP_{t-1} + \beta_3 ED_{t-1} + \beta_4 INF_{t-1} + \beta_5 TRD_{t-1} + \sum_{t=0}^m \beta_6 \Delta FDI_{t-1} + \sum_{t=0}^n \beta_7 \Delta GDP_{t-1} + \sum_{t=0}^o \beta_8 \Delta ED_{t-1} + \sum_{t=0}^p \beta_9 \Delta INF_{t-1} + \sum_{t=0}^q \beta_{10} \Delta TRD_{t-1} + \varepsilon_t \tag{2}$$

$\beta_1 - \beta_5$  in the above equation give the relationship between the variables in the long run, while  $\beta_6 - \beta_{10}$  represent the short run.  $\beta_0$  and  $\Delta$  stand for the constant term and first-difference estimator, respectively.

The hypothesis of the bound test is as follows:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$$

$$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$$

The bound test F-Statistics value establishes the presence or absence of a cointegrating relationship between the variables. As a result, the null hypothesis of no cointegration is rejected when the bound test F-Stat. value is greater than the upper bound, and the alternative hypothesis is rejected when the reverse is the case. However, when the F-Stat. values lie between the lower and upper bound values; the result is said to be inconclusive (Pesaran et al., 2001; Narayan, 2005).

Therefore, where cointegration exists, the error correction model (ECM) is given as:

$$\Delta INQ_t = \beta_0 + \sum_{t=0}^m \beta_1 \Delta FDI_{t-1} + \sum_{t=0}^n \beta_2 \Delta GDP_{t-1} + \sum_{t=0}^o \beta_3 \Delta ED_{t-1} + \sum_{t=0}^p \beta_4 \Delta INF_{t-1} + \sum_{t=0}^q \beta_5 \Delta TRD_{t-1} + \lambda ECT_{t-1} + \varepsilon_t \quad (3)$$

Where  $\lambda$  signifies the speed of convergence towards the long run with a negative sign,  $\beta_1 - \beta_5$  are the short-run dynamic parameters with the adjustment of the model to its long-run equilibrium.

Lastly, different post-estimation tests, such as the normality and stability tests, as well as the heteroskedasticity and serial correlation tests, were carried out to ensure that the outcome of this study is fit for policy recommendations.

## DISCUSSION OF RESULTS

**Table 2: Descriptive Statistics**

Variable	Observation	Mean	Standard Dev.	Minimum	Maximum
INQ	43	42.74	3.95	34.70	51.95
FDI	43	1.18	1.01	-1.15	4.28
GDP	43	3.07	5.26	-13.13	15.33
ED	43	7.52	3.44	1.87	12.74
INF	43	18.74	16.32	5.39	72.84
TRD	43	32.00	12.41	9.14	53.28

Source: Authors' computation

Table 2 depicts the characteristics of the variables under consideration, and the INQ variable has a standard deviation of 3.95 percent. The moderate difference between the maximum and minimum values of INQ supports this deviation. Thus, the INQ's mean value of 42.74 suggests a moderate level of income inequality in Nigeria within the study period.

**Table 3: Correlation Matrix**

	INQ	FDI	GDP	EDL	INF	TRD
INQ	1.0000	0.2270	-0.0522	-0.3381	0.1354	0.1929
FDI	0.2270	1.0000	0.3197	0.1607	0.2110	0.2956
GDP	-0.0521	0.3197	1.0000	0.3634	-0.2094	0.5020
ED	-0.3381	0.1607	0.3634	1.0000	-0.3067	0.2480
INF	0.1354	0.2110	-0.2094	-0.3067	1.0000	-0.0579
TRD	0.1929	0.2956	0.5020	0.2480	-0.0579	1.0000

Source: Authors' computation

Table 3 shows the degree of direction the variables are moving concerning each other. The positive correlation between INQ and FDI indicates that FDI inflows in Nigeria could lead to income inequality. Likewise, the direct correlation between FDI and GDP suggests that the flow of FDI into Nigeria will likely cause the economy's growth. However, the correlation result shows an expected decline in income disparity when the nation's economy grows.

**Table 4: Phillips-Perron Unit Root Test**

Variables	Level		First Difference		Decision
	Constant	Constant & Trend	& Constant	Constant & Trend	
INQ	-4.5428***	-4.9321***	-----	-----	I(0)
FDI	-4.1242***	-3.9346**	-----	-----	I(0)
GDP	-3.7920***	-4.2393***	-----	-----	I(0)
ED	-0.6605	-2.0136	-3.5660**	-3.5169*	I(1)
INF	-2.9990**	-3.0985	-----	-----	I(0)
TRD	-3.0798**	-3.3603*	-----	-----	I(0)

Source: Authors' computation

The unit root result above depicts variables with different integration orders. That is, all variables except ED are in I(0). Thus, we utilised the ARDL model to investigate the presence or otherwise of a long-run relationship between the variables under consideration.

**Table 5: Bound Test**

F - Statistics	Significance	Lower Bound	Upper Bound	Decision
		I(0)	I(1)	
<b>6.25</b>	5%	2.62	3.79	Cointegrated

Source: Authors' computation

From Table 5 above, we reject the null hypothesis of no long-run relationship between our variables and conclude that our variables INQ, FDI, GDP, ED, INF, and TRD are cointegrated. We, therefore, present the result of the predictable relationship in the next table (Table 6).

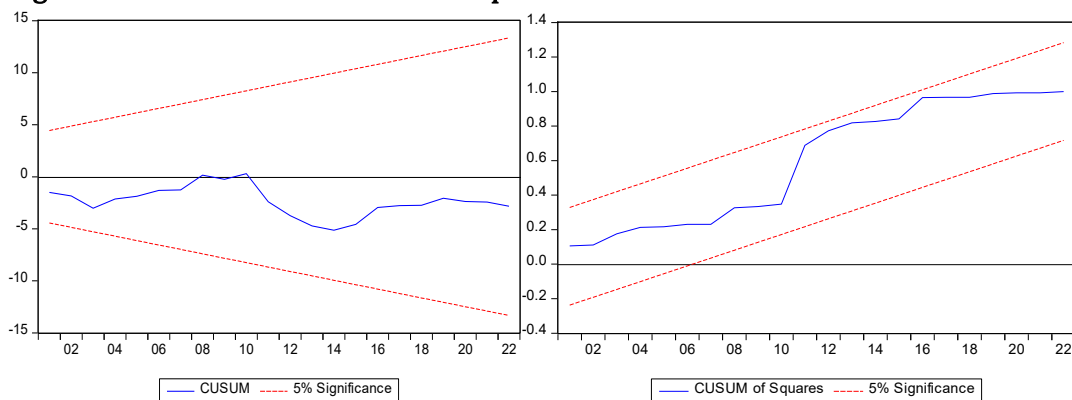


Table 6: Estimates of ARDL Regression

Dependent variable: $INQ_t$				
Variable	Coefficient	S. E	t-Statistic	p-value
Constant	43.90465	6.603937	6.648254	0.0000
$\Delta INQ_{t-1}$	0.260563**	0.128500	2.027723	0.0549
$\Delta FDI_t$	1.208415**	0.502912	2.402836	0.0251
$\Delta FDI_{t-1}$	-4.027356***	0.757353	-5.317674	0.0000
$\Delta FDI_{t-2}$	-3.130404***	0.657493	-4.761125	0.0001
$\Delta FDI_{t-3}$	-2.638241***	0.626822	-4.208916	0.0004
$\Delta GDP_t$	-0.013968	0.122170	-0.114335	0.9100
$\Delta GDP_{t-1}$	0.213081*	0.122970	1.732788	0.0971
$\Delta GDP_{t-2}$	-0.017409	0.127425	-0.136621	0.8926
$\Delta GDP_{t-3}$	-0.185329*	0.093586	-1.980302	0.0603
$\Delta ED_t$	4.457700**	1.711837	2.604045	0.0162
ECT	-0.998116***	0.147083	-6.786066	0.0000
FDI	4.151911**	1.817583	2.284304	0.0324
GDP	-0.120145	0.357107	-0.336440	0.7397
ED	-0.608967**	0.252679	-2.410045	0.0248
INF	-0.029865	0.043334	-0.689181	0.4979
TRD	-0.061811	0.063256	-0.977147	0.3391
Adjusted R <sup>2</sup>	0.712992			
F-statistics	9.581873[0.0000]			
Durbin-Watson stat	1.846061			
Ramsey RESET linearity test	0.7433[0.5749]			
Jarque-Bera Normality test	0.174568[0.9164]			
Breusch-Godfrey Serial correlation test	1.6193[0.8053]			
Breusch-Pagan-Godfrey heteroskedasticity test	22.1987[0.1369]			

Source: Authors' computation

Figures 1 and 2: CUSUM and CUSUM Squares



In Table 6, we present the outcome of estimating the impact of FDI on inequality in Nigeria. From the short-run result, the positive and significant one-period lagged value of our dependent variable, INQ, suggests the presence of income inequality in Nigeria. Our finding is consistent with those of Xu et al. (2021), who examined the relationship between Trade, FDI, and income inequality in a panel study of sub-Saharan African countries. Apart from the previous periods, the coefficient of FDI in the current period is both significant and positive, signifying a direct and adverse relation between income inequality and FDI in Nigeria. That is, a percentage point rise in FDI will produce a 1.208 unit rise in income disparity in the country *ceteris paribus* and vice-versa. Likewise, economic growth and education exacerbated the country's inequality.

However, the impact of FDI on our income inequality variable is not different from that of the short run, which implies that FDI inflows are major contributors to the widening income gap in the nation. From our result, the coefficient of FDI is positive and significant at a 5 percent level – implying that a one percent increase in FDI will cause inequality to increase by 4.152 units. Our findings demonstrate that a further rise in FDI inflows aggravates Nigeria's income disparity between the rich and poor. The reason for this could be that FDI inflows are not evenly spread out to different sectors of the economy or even regions within the country, such that they only attract the services of mostly skilled workers. On the contrary, Nguyen (2023) and Xu et al. (2021) found in their studies that FDI reduces income disparity, particularly in less developed countries (LDCs). They argued that the nature of FDI in these parts of the world employs the services of low-skilled labourers due to their low skills requirements. Unlike in the case of the short run, education, in the long run, produced a favourable relation with the dependent variable. The coefficient of education is negative and significant at 5%, indicating a narrowing income gap. This finding is consistent with that of Nguyen (2021), who averred that better education equips particularly people with low incomes with employable skills. Also, when these economically disadvantaged individuals are gainfully employed, it helps bridge the income gap between the rich and the poor.

Our error correction term (ECT) is both significant and has a negative sign, indicating a tendency for our variables to converge to their long-run steady state. Thus, any long-run disequilibrium in the system will be corrected at a relatively high speed of 99.8%. Given the degrees of freedom, the adjusted R<sup>2</sup> value of 0.713 shows that 71.3 percent variations in our regressand (INQ) are being explained by the regressors (FDI, GDP, ED, INF, TRD). The significant F-Stat value of 9.58 shows that our model is adequate.

Moreover, our model is specified correctly and is valid for policy recommendations, as evidenced by the results of the different diagnostic tests we performed. That is, the model for our study passed the test for heteroskedasticity, serial correlation, normality, and linearity following a very high probability value of above 1%. Likewise, it was stable within the 5% bound for CUSUM and CUSUMSQ.

## **CONCLUSION AND RECOMMENDATIONS**

This study empirically investigated the impact of FDI on income inequality in Nigeria in line with attaining Sustainable Development Goals (SDGs) 10. To this end, we utilised annual time series data from 1980 to 2022 and analysed the data using the ARDL framework. The result of our study evidenced the presence of a cointegrating

relationship among our variables of interest. We also found that FDI inflows into Nigeria exacerbate the level of income inequality both in the short run and long run. While growth contributed to worsening inequality levels in the short run, education produced mixed outcomes, with the long run being favourable – in terms of lowering the income gap in the country. Therefore, we recommend that the government finetune its policy to attract quality FDI that could stimulate the economy and provide better job opportunities. Second, it should develop its human capital by investing more in providing quality education that would produce individuals with employable knowledge and skills. Third, to address the uneven spread of FDI across the country, the government should invest and develop its critical development infrastructure evenly in the different parts or regions of the country. Lastly, there should be an improvement in the level of security and the anti-corruption campaign.

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