Trade Openness, FDI and Income Inequality: New Empirical Evidence from Nigeria

Otevřenost obchodu, PZI a příjmová nerovnost: Nová empirická zjištění z Nigérie

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Abstract

A huge number of empirical literature has carried investigation on trade openness-income inequality nexus globally. However, there are areas of knowledge gap on the part of the impacts of FDI inflows on inequality to the Nigerian economy. As a result of this knowledge gap and growing concern for variations in methodologies and scope which makes the debate on nexus between trade openness, FDI and income inequality not beyond controversy. Hence, this study examines the nexus between trade openness, FDI and income inequality in Nigeria between 1981 and 2019 using ARDL methodology. Our findings show that shows that trade openness exerts a negative effect on income inequality in the short-run. This implies that rising trade openness leads to decline in inequality. Equally, the study finds that FDI is negatively related to income inequality. The findings are in tandem the theoretical prediction of Stolper-Samuelson's theorem in case of Asia that trade openness and FDI inflow impact income inequality. The findings on government expenditure also exerts a positive effect on inequality. Given that proxies for institutional and macroeconomic determinants demonstrate a diverse variety of indications and effects, this study suggests a policy stimulus aimed at enhancing economic and social structures while also stimulating FDI influx potential in order to raise household incomes.

Abstrakt

V empirické literatuře se objevuje množství studií o vztahu mezi otevřeností obchodu a nerovností příjmů v celosvětovém měřítku. V oblasti dopadů přílivu přímých zahraničních investic na nerovnost v nigerijské ekonomice však existují mezery ve znalostech. V důsledku těchto chybějících znalostí a rostoucích obav z rozdílů v metodikách a rozsahu není debata o souvislostech mezi otevřeností obchodu, přímými zahraničními investicemi a příjmovou nerovností uzavřena. Tato studie proto zkoumá souvislost mezi otevřeností obchodu, PZI a příjmovou nerovností v Nigérii v letech 1981–2019 s využitím metodiky ARDL. Naše zjištění ukazují, že otevřenost obchodu má v krátkodobém horizontu na příjmovou nerovnost nega-

tivní vliv. To znamená, že rostoucí otevřenost obchodu vede k poklesu nerovnosti. Studie také zjistila, že PZI negativně souvisí s příjmovou nerovností. Tato zjištění jsou v souladu s teoretickou předpovědí Stolper-Samuelsonova teorému na příkladu Asie, že otevřenost obchodu a příliv PZI ovlivňují příjmovou nerovnost. Pozitivní vliv na nerovnost mají také zjištění týkající se vládních výdajů. Vzhledem k tomu, že zástupné ukazatele institucionálních a makroekonomických determinant vykazují různorodé náznaky a účinky, navrhuje tato studie politické podněty zaměřené na posílení ekonomických a sociálních struktur a zároveň na stimulaci potenciálu přílivu PZI s cílem zvýšit příjmy domácností.

Klíčová slova
otevřenost obchodu, nerovnost příjmů, ARDL, Nigérie

1 Introduction

Africa is gifted with pool of wealth and economic viability, but it has struggled to offer opportunities and a means of subsistence for all of its inhabitants, and poverty remains a severe issue majority of her population (Ogede, 2020). For decades, Sub-Saharan Africa (SSA) has seen a significant increase in economic imbalance and extreme poverty (DESA, 2019). Ten of the world's most unequal countries were indeed recorded in Africa. Income inequality has grown in tandem with a slew of inequity societal standards and a skewed allocation of service supplies (UNDP, 2017). Surprisingly, this viewpoint closely portrays Nigeria's current situation of inequality. Between 1986 and 2010, Nigeria's income distribution statistics revealed that the top 20% of earners earned half of the country's income, peaking at 52.1% in 1998, while the bottom 20% received only 5.0% of total earnings and the following 20% received around 10%. In 2018, the wealthiest 20% of Nigeria's population held 42.4% of the country's income (World Development Indicator, 2020).

Furthermore, numerous hypotheses have been advanced to explain widening income disparity (see Bigsten, 2016; Odedokun & Round, 2004; Anyanwu, 2016). One of these hypotheses outline how rising market integration in sectors such as openness to trade and foreign direct investment (FDI) have impacted income inequality around the globe, which have been at the center of social science debates. However, a significant portion of the empirical literature on the relationship between trade openness and income inequality has emerged (see Feenstra and Hanson, 1996; Meschi & Vivarelli, 2009; Jaumotte, Lall & Papageorgiou, 2013; Rahim, Abidin, Ping, Alias & Muhamad, 2014; Roser and Cuaresma, 2016; Barusman & Barusman, 2017; Roy & Roy, 2017; Maku, Adesoye, Babasanya & Adelowokan, 2018; Ogwumike, Maku & Alimi, 2018; Heimberger, 2019; Roser & Cuaresma, 2016; Dorn, Fuest & Potrafke, 2021). In recent times, studies have provided evidence that FDI and trade openness contribute to exacerbating income inequality; while another stance argues that FDI and trade openness contribute to reducing income inequality due to country's abundant resources (Barusman and Barusman, 2017; Malikane & Chitambara, 2017; Khan and Nawaz, 2019; Topuz & Dağdemir, 2020; Aigheyisi, 2020; Xu, Han, Dossou & Bekun, 2021). The above debates reveal that the relation between openness to trade, FDI and income inequality, are not beyond controversy owing to its sensitive to methodology and high-quality data.

The relationship between trade openness and income inequality is theoretically centered on the Stolper-Samuelson principle, which claims that global integration increases income inequality within industrialized countries while reduces inequality within developing countries. Several theoretical contributions, on the other hand, have exposed the inadequacies in the Stolper-Samuelson assumptions and given a number of alternative channels and repercussions for how globalization effects income disparities (see Robertson 2004; Goldberg & Pavncik 2007; Meschi & Vivarelli 2009; Roser & Crespo Cuaresma, 2016). Anecdotal evidence suggests that countries that participate in global trade expand faster and have higher living standards. Aside from that, it is frequently assumed that the benefits of increased growth are shared by the poor. It's been quite difficult to ascertain how the poor have benefited, especially when considering aggregate data. One cause for concern is that when trade expands, many other elements, such as technology and macroeconomic factors, shift. To the best of our understanding, the erstwhile studies on the subject in Nigeria and Africa at large is sparse and the few provide mixed outcomes which cannot be generalized as a true reflection of each country in the region (see Aigheyisi, 2020; Xu et al, 2021).

As a result, the current study seeks to investigate the impact of trade openness and foreign direct investment on income disparities in Nigeria from 1981 to 2019. The study makes four important contributions. First, empirical study into the relationship between trade openness, FDI, and inequality has been largely ignored in Nigeria. This study explores the relationship between trade openness, FDI, and inequality in Nigeria using the autoregressive distributed lag (ARDL) approach. In addition, to account for omitted variables, the current study considers institutional variables such as schooling. It is worth emphasizing that respected and robust institutions will help to close the country's inequality gap. Three, our findings add to the current body of knowledge on the relationship between income inequality and foreign direct investment in a net oil exporting nation like Nigeria. Finally, our findings will contribute to current research in this field and will be useful to policymakers in Nigeria and other developing countries in Africa as a region in terms of trade returns and macroeconomic concerns. Our findings reveal that trade openness exerts a negative effect on income inequality in the short-run, suggesting that rising trade openness leads to decline in inequality. Equally, the study finds that FDI is negatively related to income inequality. The findings are in tandem the theoretical prediction of Stolper-Samuelson's theorem in case of Asia that trade openness and FDI inflow impact income inequality. Section two presents a related literature on the subject. Section three and four discusses methodology, and results respectively. Section 5 concludes the study.

2 Review of related empirical literature

Economic growth has often been given priority as an anti-poverty measure while the negative links between growth and inequality have been largely ignored by policy makers. However, the word globalization has been used interchangeably as trade openness in the literature while the research linking trade openness to inequality has been intense over two decades. According to Lindert and Williamson (2001) and O'Rourke (2001), global inequality has increased due to differences between countries rather than within countries. As a result, the effects of globalization on intra-country inequality will be highly variable. The direction of the impact on intra-country inequality is decided by the participating country's strategy

for exploiting it. Poor governance and non-democracy may be the root causes of intra-country inequality in laggard countries, rather than globalization. Lindert and Williamson (2001) classified the impact of globalization on inequality into five conclusions. According to Talbot (2002), a new variety of global unfairness has imposed itself over the previous condition, explaining growing global inequality. Talbot (2002) uses the example of coffee production and transnational business capital control. One of the most notable consequences of nineteenth-century globalization, according to Bata and Bergesen (2002), was an increase in global inequality. They go on to state that studying the reasons of rising inequality, as well as comprehending how the global system works and the consequences of globalization in the twentieth century, is vital.

From 1980 to 2012, Maku et al (2018) compare the effects of globalisation on human welfare in 16 SSA nations that are both substantially and weakly globalised. The comparison analysis found a mixed result in some situations and a unidirectional result in others when using panel fixed effects. In general, countries with higher levels of globalisation have improved their human welfare metrics more than those with lower levels of globalization. Heimberger (2019) examines the nexus between openness and inequality for data set consisting of 1254 observations and adopt meta-analysis and meta-regression methodology. The findings show that openness to trade has a small-to-moderate positive impact on income inequality. Dorn, Fuest, and Potrafke (2021) examine the impact of trade openness on income inequality in 139 countries during 1970 and 2014. According to the study's conclusions, the consequence varies per country. Trade openness benefits some very poor significantly in emerging and developing economies, but not all of the poor. Furthermore, the findings demonstrate that trade openness exacerbated income disparities in the majority of developed economies, with outliers driving the effect. Trade openness has a major impact on inequality in China and other developing nations, according to the research.

In recent times, studies have provided mixed evidence on FDI and trade openness nexus. The first group argue that FDI and trade openness contribute to worsening of income inequality; while another stance argues that FDI and trade openness contribute to reducing income inequality (Brueckner & Vespignani, 2017; Malikane & Chitambara, 2017; Khan & Nawaz, 2019; Topuz & Dağdemir, 2020; Aigheyisi, 2020; Xu, et al 2021). For instance, the findings of Barusman and Barusman (2017) on debate focussing on the United States from 1970 and 2014 reveal that trade openness increases income inequality. Such that an increase in trade volume leads to a wider income gap as more income goes to the top 10% wealthiest people in the United States. The findings also confirm that there is a negligible effect of FDI inflow on income inequality in the United States. Khan and Nawaz (2019) carried out another investigation on Commonwealth of Independent States (CIS) from 1990 to 2016 using system-generalized method of moments (SYS-GMM) methodology. The findings reveal trade openness and FDI have significant impacts on income inequality when interacted with inequality, proxy with Gini-index. The findings further provide divergent outcomes when trade to openness and FDI were interacted with education, suggesting a crucial link at which inequality is impacted. Recently, Aigheyisi (2020) investigates the impact of foreign direct investment (FDI) and its interaction with trade openness on income inequality in Nigeria from 1981 to 2015 using dynamics ordinary least square method (DOLS). The findings reveal that FDI inflows positively affect income inequality. However, the interaction between FDI and trade openness negati-

vely affects income inequality suggesting that greater openness of the economy to international trade would engender reduction of income inequality caused by FDI in the country. Xu et al (2021) explore the relationship between trade openness, foreign direct investment (FDI), and income inequality in Sub-Saharan Africa (SSA) spanning from 2000 to 2015. They use the generalized method of moment (GMM) technique. The data reveal that FDI and income have a statistically significant negative connection with income inequality, meaning that as FDI and per capita income rise, so does income inequality.

3 Data and Methodology

3.1 Data and variable description

The study employed the annual time series data of Nigeria from 1981 to 2019. The variables used including their measurement, definition and source are presented in Table 1 while justification for selecting the country and time frame has stated in the previous discussion. The data were sourced from different agencies and databases like Standardized world inequality database, CBN Statistical Bulletin, and World Development Indicator (WDI). The crucial variables of interest in this paper are income inequality, FDI, and trade openness. Income inequality is gauged by the Gini coefficient index, which is a scale from 0 to 100. However, the definitions and methodologies for estimating the Gini index are similar among these references (Lecuna, 2019; Mocan, 1999; Ogede, 2020). The study also explores foreign direct investment to gauge the impact of financial integration. Approaches for estimating trade openness, in general, differ in several studies significantly. However, this study defines it as a trade balance stated as a proportion of the GDP in equation (1), following the work of Ogede (2004), Ogwumike et al. (2018), and Maku, et al (2018).

$$OP = \frac{\{X+M\}}{GDP} \qquad (1)$$

Where X and M represent import and export respectively. Also, the study uses government expenditure (GEXP) as a percentage of government expenditure to GDP while financial capital to the private sector (FCPS) is explored to gauge the impact of financial development. The study employed secondary school enrolment as an alternative to inequalities in human resources as a ratio of the gross national product. Meanwhile, literature provides conflict outcomes with regards to the impact of human capital on inequality (see Acemoglu, 2002; Lemieux, 2006).

Table 1: Variable measurement, definition, and sources

Variable (s)	Measurement	Source
Income Inequality (INQ)	Index	Standardized world inequality
Trade openness (OP)	(Import + Export)/GDP	CBN Statistical Bulletin
Government Expenditure (GEXP)	% GDP	CBN Statistical Bulletin
Financial capital to the private sector (FCPS)	% of GDP	WDI
Foreign Direct Investment FDI)	% of GDP	WDI
Real Gross Domestic Product (GDP)	GDP at constant 2010 prices in billions	CBN Statistical Bulletin
Secondary school enrollment Education (EDU)	% of gross enrolment	WDI

3.2 Model specification

The model developed by Jeffery (2007) is adapted to forecast the relationship between trade openness, foreign direct investment, and income inequality in Nigeria. Our method, on the other hand, varies in several ways from this one. For example, the previous study focused on Commonwealth countries; in our case, we centered on Nigeria. Second, the prior study used school enrollment and inflation as a control variable; as a result, we used government spending and financial credit to the private sector as a proportion of GDP, both of which are important determinants in determining income disparity. The model specifies income inequality as a function of trade openness, foreign direct investment and economic growth. Thus, the equation is stated functionally as:

$$INQ = f(OP, FDI, Gr) \qquad (2)$$

Where: GINI is Gini coefficient; OP and,FDI are vector of trade openness and foreign direct investment respectively, and Gr is gross domestic product. In mathematical form, it becomes:

$$INQ_t = \alpha_0 + \beta'OP_t + \beta_1 Gr_t + \mu_t \quad (3)$$

The variables remain as defined; β' is vector of the parameters of trade openness; α_0, β_1 are parameters; t is time; μ is error term. Trade openness and foreign direct investment have both direct and conditioned effects on income disparities. Taking previous data into consideration, we might conclude that FDI will always raise income disparity, whereas trade openness will redistribute income in certain circumstances, such as access to education, increased government spending, and access to capital. We use the regression mode to incorporate the interaction terms of trade openness variables and the degree of education or growth in order to assess the impact of trade openness on income inequality (3), to becomes:

$$INQ_t = \alpha_o + +\beta'OP_t + \beta_1 Gr_t + \beta_2 GEXP_t + \beta_3 FCPS_t + \beta_4 EDU_t + \beta_5 FDI_t + \mu_t \ (4)$$

Where: GINI is Gini coefficient measuring income inequality; OP is a vector of trade openness indices measured by trade openness; Gr is gross domestic product proxy of economic growth; GEXP is government expenditure to GDP; FCPS is financial credit to private sector to GDP; EDU is secondary school enrolment ratio; FDI is the financial integration; α_o, β_{1-5}a are parameters; t is time; μ is error term. Consequently, the study used the ARDL estimation technique to achieve the objective of this study. This technique is preferred because it computed both the short and long-run estimates of the model. This methodology was developed by Pesaran and Shin (1999) and Pesaranet al (2001). The model is specified as:

$$\Delta INQ_t = \alpha_0 + \sum_{i=1}^{p} \beta_i \Delta INQ_{t-i} + \sum_{j=0}^{q} \beta_{0i} \Delta OP_{t-j} + \sum_{j=0}^{q} \beta_{1i} \Delta Gr_{t-j} + \sum_{j=0}^{q} \beta_{2i} \Delta GEXP_{t-j} +$$
$$\sum_{j=0}^{q} \beta_{3i} \Delta FCPS_{t-j} + \sum_{j=0}^{q} \beta_{4i} \Delta EDU_{t-j} + \sum_{j=0}^{q} \beta_{5i} FDI_{t-j} + \delta_1 INQ_{t-1} + \delta_2 OP_{t-1} +$$
$$\delta_3 Gr_{t-1} + \delta_4 GEXP_{t-1} + \delta_5 FCPS_{t-1} + \delta_6 EDU_{t-1} + \delta_7 FDI_{t-1} + \mu_t \qquad (5)$$

All variables remain as earlier described while $\delta_1 - \delta_7$ are parameters for the long-run relationship between INQ and the explanatory variables. $\beta_{0i} - \beta_{5i}$ are parameters for the short-run relationship between INQ and the explanatory variables.

4 Results and Discussion

4.1 Preliminary results

This section addresses the empirical evidence on the relationship between income inequality, FDI, and trade openness. The descriptive statistics and statistical properties of the series under investigation are presented in Table 2. The table demonstrates that the mean of INQ is not distant from its maximum and minimum values. This demonstrates that the series has most likely not suffered as a result of the variability during the time period under consideration. Given that the probability of its Jarque-Bera (J-B) test is less than 0.05, the series is not distributed normally. Given that it is larger than 3, the series is negatively skewed despite possessing a leptokurtic kurtosis.

Table 2: Descriptive Statistics

	INQ	FDI	FCPS	OP	EDU	GEXP	GDP
Mean	37.903	1.553	9.210	16.951	22.261	3.726	34690.67
Median	43.500	1.159	8.169	11.247	25.178	2.091	23688.28
Maximum	44.000	5.791	19.626	56.534	56.205	9.448	71387.83
Minimum	0.000	0.257	4.958	0.098	0.000	0.911	13779.26
Std. Dev.	14.728	1.234	3.556	16.678	17.826	2.838	20237.78
Skewness	-2.223	1.738	1.195	0.609	-0.071	0.795	0.674
Kurtosis	5.942	6.070	3.999	2.115	1.725	2.166	1.882
Jarque-Bera	46.169	34.9578	10.902	3.679	2.674	5.241	4.986
Probability	0.000	0.000	0.004	0.158	0.263	0.073	0.083

Interestingly, on FDI, the highest value is greater than the mean value, indicating that the series may fluctuate. The series is leptokurtic and favourably skewed. According to the Jarque-Bera test, the series is not regularly distributed. FCPS is demonstrated to have a maximum value of around 20% of GDP, with a mean value of 9.2 percent. While not normally distributed, the series is favourably skewed with a leptokurtic kurtosis. The OP series is demonstrated to have a maximum value that is significantly greater than the minimum value. The series features a positively skewed and normally distributed platykurtic kurtosis. EDU is reported to have a mean more than twice lower than its maximum value suggesting that secondary enrolment in Nigeria has suffered several episodes of fluctuations. The series is negatively skewed with a platykurtic kurtosis and is normally distributed. GEXP and GDP both have maximum values that are larger than the mean values. These series are positively skewed, normally distributed, and possess platykurtic kurtosis. The correlation matrix is reported in table 3 and explains the level and extent of the direction of the relationship among the variables.

Table 3: Correlation Matrix

	GINI	EDU	FCPS	FDI	GEXP	GLOB	Gr
INQ	1	0.076	0.215	0.370	0.121	0.119	0.257
EDU		1	0.459	-0.042	0.619	0.374	0.405
FCPS			1	0.114	0.839	0.726	0.783
FDI				1	0.084	-0.039	0.012
GEXP					1	0.835	0.807
OP						1	0.952
Gr							1

Table 4 shows the results of the stationary test utilizing the augmented Dickey-Fuller (ADF) tests. The results of the variables' stationarity tests are presented at both levels and first difference. After validating the stationarity of our variables, we use the ARDL bound test to see if there is a long-run link between them, as well as estimate both the short-run and long-run estimates of our parameters.

Table 4: Augmented Dickey-Fuller (ADF) unit root test

	Level			First Difference			
Variable(s)	None	Constant	Constant and trend	None	Constant	Constant and trend	Stationary Status
INQ	-0.733	-2.380	-1.379	-4.243***	-4.127***	-4.867***	I(1)
EDU	-1.511	-2.265	-2.169	-7.628***	-7.538***	-7.506***	I(1)
FCPS	0.471	-2.255	-4.097**	-5.691***	-5.732***	-5.638***	I(1)
FDI	-2.130**	-3.933***	-3.851***	-8.133***	-8.019***	-7.973***	I(0)
GEXP	-0.176	-1.113	-2.855	-5.728***	-5.697***	-5.617***	I(1)
OP	2.050	0.764	-2.541	-3.952***	-4.355**	-4.549**	I(1)
Gr	2.526	-0.097	-2.403	-2.158**	-3.434**	-3.352*	I(1)

4.2 Empirical Results

Table 5 shows the results of the ARDL bound tests for demonstrating the long-run relationship among the variables using the Akaike Information Criterion (AIC) to automatically determine the lag duration. The crucial boundaries were chosen using Pesaran et al. (2001) values for the restricted intercept and no trend. F-statistics at k = 6 were used to test the hypothesis against the critical bound values at various significance levels. The F-statistic

values are higher than the critical values at the upper bound levels, according to the findings of the ARDL bound test shown in Table 5. As a result, we reject the null hypothesis that no cointegration exists for the four models at the 1%, 5%, and 10% levels. As a result, no long-term relationship exists between 1981 and 2019. Based on the evidence of no long-run relationship between the estimated variables, we estimated short-run parameters, which are shown in Table 5.

Table 5: ARDL bounds test result for Cointegration

Dependent variable			Functions		F-statistics	
Income Inequality (INQ)					2.756031	
	10%		**5%**		**1%**	
	I(0)	**I(1)**	**I(0)**	**I(1)**	**I(0)**	**I(1)**
Critical bound values	2.12	3.23	2.45	3.61	3.15	4.43

Table 6 presents the empirical results of relationship between trade openness, FDI and income inequality in Nigeria. The short-run result shows that trade openness exerts a negative effect on income inequality. This implies that rising trade openness leads to decline in inequality. This is in line with the a priori expectation. All else equal, a percentage increase in trade openness will result in about 0.86 per cent of income inequality. This negative effect of trade openness on inequality is however not statistically significant at 5%. The findings oppose the theoretical prediction of Heimberger (2019). Our findings show that FDI is negatively related to income inequality. All else held constant, the more financially integrated is Nigeria with the rest of the world, the lower the inequality. The output shows that inequality drops by 0.55 for every 1 percent rise in financial integration. This relationship is however not statistically significant. The finding is tandem with the finding of Xu et al (2021) on selected Sub-Saharan Africa (SSA) countries, and in contrary to the empirical examination by Aigheyisi (2020) who argued that FDI inflows positively affect income inequality.

The control variables have varied effects on income inequality. Economic growth, proxy with gross domestic product is observed to exert a positive effect on inequality. This implies that higher economic growth leads to higher inequality. More specifically, a 1 percent rise in gross domestic product will induce a rise in inequality by about 1.16 per cent, all else remaining constant. This relationship is also statistically significant at the 0.05 level of significance for this study. Government expenditure also exerts a positive effect on inequality. That is, the higher the spending by the government, the more the inequality. More precisely, a 1 percent rise in government expenditure will result in growth in inequality by about 1.2. This positive effect is not statistically significant at the 0.05 level of significance. On the other hand, credit to the private sector is negatively related to inequality. In essence, more credit to the private sector led to lower inequality. More specifically, a 1 percent rise in credit to the private sector leads to a decline in inequality by about 1.01. This effect is however not statistically significant given that the t-statistics of the coefficient of credit to the private sector is greater than the 0.05 threshold for this study. Finally, education

and inequality are shown to be negatively related. That is, the higher the educational attainment, the lower the inequality. According to the result, a 1 percent rise in education will lead to a fall in inequality by about 0.035. This effect is also not statistically significant at the 0.05 level given that the t-statistics of the coefficient for education is greater than the 0.05 level that was set for this study.

The adjusted R2 of the model indicates that the model has a satisfactory fit, as the explanatory variables account approximately 47 percent of variance in inequality. Additionally, the probability value of F-statistics for the joint significance of the influence of the predictor factors on inequality demonstrate that their effects are jointly significant when the probability value of the F-statistics is less than the 0.05 threshold for this study. Furthermore, the F-statistics is greater than the 0.05 allowed for this investigation, according to the Breusch-Pagan-Godfrey Heteroskedasticity Test. As a result, the study conclude that the residual term of the model does not suffer from heteroscedasticity, and the result also affirms using the normality and Breusch-Godfrey Serial Correlation LM Tests.

Table 6: Trade openness, FDI and income inequality nexus in Nigeria

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GINI(-1))	0.0108	0.23911	0.04508	0.9645
D(GLOB)	-0.8633	0.48717	-1.77202	0.0902
D(LRGDP)	116.03	52.3353	2.21702	0.0373**
D(GEXP)	1.1705	1.78279	0.65657	0.5183
D(FCPS)	-1.0106	1.06563	-0.94838	0.3532
D(EDU)	-0.0353	0.15403	-0.22908	0.8209
D(FDI)	-0.5476	1.63318	-0.33529	0.7406
ECT(-1)	-0.3779	0.18035	-2.09517	0.0479**
Adj. R2	**0.47**			
F-stat	**3.2887***			
Models' diagnostic and stability test				
Normality test		6.0606		{0.0483}
Serial correlation		0.54456		{0.5885}
Heteroscedasticity test		2.2639		{0.0857}

***, ** and * represent statistical significance level at 1%, 5% and 10%, respectively.

The values in parenthesis "{ }" reveal the non-acceptance of the null hypothesis at a 5% level.

5 Conclusion and Recommendations

A huge number of empirical literature has carried investigation on trade openness-income inequality nexus globally. However, there are areas of knowledge gap on the part of the impacts of FDI inflows on inequality to the Nigerian economy. As a result of this knowledge gap and growing concern for variations in methodologies and scope which makes the debate on nexus between trade openness, FDI and income inequality not beyond controversy. Consequently, this study set out to empirically examine the nexus between trade openness, FDI and income inequality in Nigeria between 1981 and 2019 using ARDL methodology. Our findings show that shows that trade openness exerts a negative effect on income inequality in the short-run. This implies that rising trade openness leads to decline in inequality. This is in line with the a priori expectation. Equally, the study finds that FDI is negatively related to income inequality. Economic growth exerts a positive effect on inequality, implying that higher economic growth leads to higher inequality. The findings are in tandem the theoretical prediction of Stolper-Samuelson's theorem in case of Asia that trade openness and FDI inflow impact income inequality. The findings on government expenditure also exerts a positive effect on inequality. That is, the higher the spending by the government, the more the inequality. On the other hand, credit to the private sector is negatively related to inequality. In essence, more credit to the private sector led to lower inequality. Finally, education and inequality are shown to be negatively related. That is, the higher the educational attainment, the lower the inequality.

Given that proxies for institutional and macroeconomic determinants demonstrate a diverse variety of indications and effects, this study suggests a policy stimulus aimed at enhancing economic and social structures while also stimulating FDI influx potential in order to raise household incomes. Furthermore, there should be a strong desire to invest in social infrastructure, accelerate the process of openness, and divert trade flows to industries that deliver structural transformation.

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