



Trade Openness and Poverty Reduction in Nigeria

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Abstract: This study examines the impact of trade openness on poverty in Nigeria between 1985 and 2020. The study employs Auto-Regressive Distributed Lag (ARDL) estimation technique and the result reveals that domestic credit to the private sector as a ratio of Gross Domestic Product (GDP), electric power consumption, primary school enrollment rate and KOF globalization index reduce poverty in Nigeria, while GDP per capita stimulate poverty in Nigeria. Thus, this study recommends that the economy should be made more open to allow exportation of goods produced by the poor in order to further reduce poverty. Furthermore, the citizens should be motivated to enroll in school to reduce illiteracy and poverty in Nigeria.

Keywords: Poverty reduction; trade openness.

JEL Classification: F40; I30

1. Introduction

Poverty is a global phenomenon, but it is well pronounced in developing countries most especially sub-Saharan Africa country Nigeria inclusive. Poverty is a state of being poor and it is the characteristic of people at the lowest class of economic status. These are people who cannot afford the basic necessity of life. According to Ravallion (1998), there is a poverty line, which is a cut-off point separating the poor from the non-poor and those below the line are considered poor.

Poverty lines, or the international purchasing power parity [PPP] varies over time, it was \$1.25 in 2005 and changed to \$1.90 in 2011. The 2011 rate is the rate that is still in use.

Globally, the rate of poverty is on the decline, in Africa the rate declined from 57 percent in 1990 to 43 percent in 2012. However, during the same period the population of Africa continued to increase rapidly, as a result the number of people living in extreme poverty increased by more than 100 million (from 288 to 389 million) (Beegle, Christiaensen, Dabalen & Gaddis, 2016). According to United Nation (2015), all developing regions, except Africa, have reached the Millennium Development Goal (MDG) of halving poverty between 1990 and 2015. This indicates the urgent need to tackle the rate of poverty in Africa going by the available data.

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In Nigeria the level of poverty is worrisome as the rate of poverty keeps increasing from 41.3% in 1981 to 61.2% in 2017 and population also keep increasing. In 2018, Nigeria became the headquarters of poverty overtaking India with 86.9 million of poor people with the total population of 195.9 million as against India with 71.5 million poor people with the total population of 1.353 billion. In reducing poverty in the country, Nigeria government has been formulating different economic policies among which are fiscal policies, monetary policies, industrial policies and even trade policies (trade openness). Trade openness came into being in Nigeria in 1986 following the deregulation of the economy and since then there have been several policies to further enhance the liberalization of trade in the country among which are reduction of tariffs and non-tariff barriers, reduction of import duties, devaluation of currencies in order to encourage exports, liberalization of exchange rate etc.

Cain, Hasan and Mitra (2010) and Basanta and Malvika (2014) identified trade openness as one of the means of alleviating poverty. The 2015 joint publication of WTO-World Bank titled “*The Role of Trade in Ending Poverty*” buttress the fact that trade plays a critical role in reducing poverty and that further integration of developing economies into the world economy will help in achieving the first goal of SDG which is to eradicate extreme poverty by 2030. Also, in the 2030 Global Agenda for Sustainable Development, trade was identified as an engine for poverty reduction and inclusive economy growth (WTO 2018). The benefits of trade liberalization include, openness of domestic product to international community, access to international products that are not produced by the country, efficient allocation of resources, access to modern technologies that are not available in the domestic market, encourages competition and specialization among others.

With the aforementioned benefits it is expected that trade would enhance growth and reduce poverty in Nigeria. However, few researchers have been able to investigate the effect of trade openness on poverty in Nigeria, as most researcher focuses on trade openness and economic growth (Arodoye & Iyoha, 2014; Ude & Agodi, 2015). Globally, there is no consensus among the researchers that had investigated this topic, researchers like (Lestari (2017); Basanta and Malvika (2014); Dollar and Kraay (2004) and Kelbore (2015)), all found that trade openness reduces poverty while researchers, Milanovic (2005) and Lee (2014), found that trade openness increases poverty, therefore the debate on the impact of trade on poverty remains inconclusive so this research work would investigate further the effect of trade openness on poverty.

2. Literature Review

The genesis of trade liberalization in Nigeria can be traced to the country’s adoption of structural adjustment programme (SAP) in 1986. SAP was adopted sequel to the country’s economic recession vis-a-vis fiscal crisis, balance of payment crisis, negative economic growth, shortage of foreign exchange, high rate of poverty, debt crisis to mention a few. The aforementioned problems were as a result of the collapse of world oil price falling from \$30 per barrel in 1980 to less than \$5 per barrel in early 1986, reduction of Nigeria’s oil supply quota by OPEC and huge public debt burden. In an effort to spend the country out of the recession as recommended by Keynes the country requested for new loan and restructuring of the existing loans, as a condition for granting the request the International Monetary Fund (IMF) recommend that Nigeria economy be restructured holistically and this restructuring was called SAP.



One of the policy target of SAP was trade liberalization which could also be called trade openness. Trade openness is the incorporation of individual country's economy into the world economy. It links countries to each other in order to foster trade relationship, economic growth of the trading partners and poverty reduction. Trade liberalization is the reduction of trade barriers, removal of internal trade restriction, diffusion of technology, movement of labour across borders and liberalization of external capital flow. Trade liberalization measures the extent of export promotion that is, shifting resources from import substitution to export activities, increase in the degree of openness, increase in the share of export and import in national income and marketisation as well as changing the structure of incentives and institutions (Mwaba, 2000).

Onakoya, Johnson and Ogundajo (2019) explored the relationship between trade liberalization and poverty between 2005 and 2014 in 21 African countries using the pooled Ordinary Least Square (OLS) and Johansen co-integration estimation technique. The study revealed that trade openness and exchange rate reduce poverty while foreign direct investment and inflation had positive impact on human development index. Kelbore (2015) investigated the effect of trade openness and structural transformation on poverty reduction on 43 African countries between 1981 and 2010. Using System generalized methods of moments, the study revealed that trade openness aggravate poverty while structural transformation alleviate poverty. Furthermore, the study also examined the causal relationship between trade openness and structural transformation, and the results showed that there is a bi-causal relationship between the two variables.

Olagunju, Ogunniyi, Oguntegbe, Raji and Ogundari (2019) investigated the role of human capital in globalization on poverty gap in 110 developing countries from 1970 to 2015 using System Generalized Method of Moments estimation technique. The findings revealed education and health enhanced the adverse impact of globalization on poverty gap. Lestari (2017) investigated the dynamic impact of international trade openness on poverty in Indonesia between 1978 and 2015. The study made use of Vector Error Correction Model estimation technique and the result showed that trade openness has no significant impact on poverty in the short run. However, it reduced poverty in the long run. Bayar and Sezgin (2017) examined the interaction among trade openness, poverty alleviation and inequality in 11 Latin American countries. The study employed a panel data analysis and the result revealed that trade openness and financial development had a negative impact on inequality and poverty negatively.

Taleb and Buthaina (2017) investigated the relationship between trade and poverty reduction through the channels of economic growth and employment between 1980 and 2014. The study showed that external factors are the major contributors to growth, especially workers' remittances, followed by external trade and then foreign direct investment inflows. But the achieved growth has not been sufficiently reflected on unemployment reduction and poverty alleviation, due to the inflated government, fast population growth combined with the flux of foreign labor and refugees.

3. Methodology

3.1 Theoretical Framework

This study employs the Heckscher-Ohlin model which was developed by Eli Heckscher and Bertil Ohlin in the 1920s, it is also known as factor proportion model. The model assumed that there are two countries and the countries have identical technology that is same production functions but the only differences between countries are these variations in the relative endowments of factors of production. The theory states that a country which has abundant capital would produce capital-intensive product and export same while a country with abundant labour would produce labour-intensive product and export same. This implies that each country should produce goods that they have relative endowed factors of production than others. With free trade, countries with abundant factor would benefit while countries with scarce factor suffers. Drawing from this theory, this study seeks to examine the relationship between poverty and trade openness in Nigeria and thus specify the linear model below:

$$POV = f(\text{Trade openness}) \quad (1)$$

Some explanatory variables which extant studies has found to positively influence poverty reduction would be introduced to the theoretical framework.

3.2 Model Specification

$$POV = f(KOFG, FDI, PSER, INFERS, GDPPC, DCPGDP)_t$$

$$POV = \beta_0 + \beta_1 KOFG + \beta_2 FDI + \beta_3 PSER + \beta_4 INFERS + \beta_5 GDPPC + \beta_6 DCPGDP + \mu_t \quad (2)$$

Where:

POV=Poverty rate is head count index representing percentage of population below \$1.90 per day poverty line (%)

KOFG=KOF Globalization index

FDI = Foreign Direct Investment

GDPPC=Gross Domestic Product Per Capita= GDP divided by population

DCPGDP=Domestic Credit to the Private sector as a ratio of GDP

PSER =Primary School Enrollment Rate

INFERS = proxied by electric power consumption

μ_t = error term.

KOF was used to measure the openness as against the orthodox use of degree of openness. It was developed by KOF Swiss Economic Institution. According to Salimifar, Razmi and Taghizadegan, (2015), KOF is more efficient in measuring openness. The index ranges between 1 and 100, the higher the value the wider the openness.

Equation 3 below is the econometrics form of equation 2:

$$POV_t = \beta_0 + \beta_1(KOFG)_t + \beta_2(FDI)_t + \beta_3(PSER)_t + \beta_4(INFRS)_t + \beta_5(GDPPC)_t + \beta_6(DCPGDP)_t + \mu_t \tag{3}$$

Variables such as FDI and INFRS which were not in rate would be transformed so that all the variables could be in the same appropriate coefficient, hence FDI and INFRS would be log. The model would become a log-linear model.

$$POV_t = \beta_0 + \beta_1(KOFG)_t + L\beta_2(FDI)_t + \beta_3(PSER)_t + L\beta_4(INFRS)_t + \beta_5(GDPPC)_t + \beta_6(DCPGDP)_t + \mu_t \tag{4}$$

3.3. Apriori Expectation

KOFG, FDI, PSER, GDPPC, INFRS and DCPGDP are expected to have negative relationship with POV.

4. Data Analysis

4.1. Descriptive Analysis

Table 1 below showed that the mean value of poverty is 56.489 while GDPPC recorded the highest mean value of 1817.285 and DCPGDP recorded the lowest mean value of 10.215. The maximum value of percentage of poor people in Nigeria in the year under review is 68.9 while the minimum value is 46.3.

Also, the standard deviation result showed that GDPPC is the most volatile variable with 456.221 and FDI as the least volatile variable with 0.954. The skewness statistics revealed that FDI and KOFG are negatively skewed while the remaining variables were positively skewed. The Kurtosis statistics showed that DCPGDP is leptokurtic indicating that the distributions are peaked relative to normal distribution while other variables are mesokurtic, indicating that the distribution of the variables is bell shaped and implying that the variable has normal distribution.

Table 1. Summary of Statistics

Variables	DCPGDP	LOG(FDI)	GDPPC	LOG(INFRS)	KOFG	POV	PSER
Mean	10.214	21.373	1817.285	4.689	49.484	56.489	90.509
Maximum	22.289	22.903	2563.899	5.055	60.210	68.900	102.108
Minimum	4.958	19.079	1332.805	4.311	37.900	46.300	78.663
Std. Dev.	4.343	0.954	456.221	0.245	6.670	5.786	6.108
Skewness	1.076	-0.180	0.399	0.006	-0.197	0.396	0.231
Kurtosis	3.582	2.474	1.497	1.513	1.791	2.381	2.138
Observations	36	36	36	36	36	36	36

4.2. Unit Root Test

The Unit Root test is used to test the stationarity of variables. This study made use of ADF and PP test to determine the statistical properties of all the variables in the model. The two tests were used to know the accuracy of the stationarity of each variable and avoid spurious regression. The result of the test is present in table 2 below. There is consistency in the result as both result shows that only FDI was

stationary at level while other variables were stationary at first difference. Sequel to different level of stationary (at level and first difference) as revealed in the result, this study made use of ARDL- Bound testing method of co-integration analysis as it is the estimation technique that accommodates this mixed stationarity level.

Table 2. Unit root test

VARIABLE	Augmented Dickey-Fuller			Phillips-Perron		
	Prob. at Level	Prob. at First Difference	Level of integration	Prob. at Level	Prob. at First Difference	Level of integration
DCPGDP	0.157	0.0002	I(1)	0.5204	0.0037	I(1)
LOG(FDI)	0.0123	0.0000	I(0)	0.0134	0.0000	I(0)
GDPPC	0.8030	0.0348	I(1)	0.8785	0.0348	I(1)
LOG(INFRS)	0.7491	0.0000	I(1)	0.7605	0.0000	I(1)
KOFG	0.7973	0.0001	I(1)	0.8256	0.0001	I(1)
POV	0.5712	0.0001	I(1)	0.5571	0.0001	I(1)
PSER	0.3294	0.0010	I(1)	0.2052	0.0205	I(1)

The autoregressive distributed lag (ARDL) model is the estimation technique that accommodates variables with different level of stationarity that variables with I(0) and I(1) however none of the variables must be stationary above the first difference.

4.3. ARDL Bound Co-integration Test

Having identified that ARDL- Bound testing method of co-integration analysis is the appropriate estimation technique to use in this study, the next step is to conduct Bound test. This test is important as it is used to determine if the model cointegrate/ long run relationship exist between the variables. To execute the procedure, an ARDL framework equation is specified below in equation (5).

$$\Delta POV_t = \beta_0 + \beta_1 POV_{t-1} + \beta_2 KOFG_{t-1} + \beta_3 LFDI_{t-1} + \beta_4 PSER_{t-1} + \beta_5 LINFRS_{t-1} + \beta_6 GDPPC_{t-1} + \beta_7 DCPGDP_{t-1} + \sum_{i=1}^q \theta_{1i} \Delta POV_{t-1} + \sum_{i=1}^q \theta_{2i} \Delta KOFG_{t-1} + \sum_{i=1}^q \theta_{3i} \Delta LFDI_{t-1} + \sum_{i=1}^q \theta_{4i} \Delta PSER_{t-1} + \sum_{i=1}^q \theta_{5i} \Delta LINFRS_{t-1} + \sum_{i=1}^q \theta_{6i} \Delta GDPPC_{t-1} + \sum_{i=1}^q \theta_{7i} \Delta DCPGDP_{t-1} + \mu_t \quad (5)$$

The variables are as defined above, θ_1 to θ_7 are the short run vector parameters while β_1 to β_7 are the long run vector parameters, furthermore, Δ is the first difference operator, q is the optimal lag length, β_0 is the constant and μ_t is the stochastic error term.

In line with Pesan et al. (2001) this work adopts F-test to know if there is cointegration/ long run relationship in the model. The null hypothesis is that there is no cointegration among the variables while the alternative is that there is cointegration in the among the variables.

The result is presented in table 3 below.

Table 3. Bound Test

Estimated Model	F-Statistics	
	9.974030	
Critical Values	Lower Bound	Upper Bound
5%	2.27	3.28

The table above present both the lower and upper bound test result aside the F-statistic result. The lower and upper bound test helps to determine whether the variables cointegrated or not. When the F-statistics is smaller than the lower bound, it indicates that there is no cointegration in the model, when the value is greater than the lower bound but lesser than the upper bound, it indicates that the cointegration among the variables cannot be determined, when the value is greater than both the lower and upper bound, it shows that the variables cointegrate.

The result from the table above showed that the value of the F-statistics for the estimating model is 9.974030 which is higher than both the lower and upper bound critical value at 5%, indicating that there is co-integration among the variables in the model. Therefore, the study can proceed to estimate both the long run and short run ARDL regression analysis.

4.4. Long-Run ARDL Model Analysis

Having established that there is cointegration in the model, it is expedient to estimate the ARDL model in order to obtain the long run coefficient.

$$\Delta POV_t = \beta_0 + \sum_{i=1}^p \beta_1 \Delta POV_{t-1} + \sum_{i=0}^{q1} \beta_2 \Delta KOFG_{t-1} + \sum_{i=0}^{q2} \beta_3 \Delta LFDI_{t-1} + \sum_{i=0}^{q3} \beta_4 \Delta PSER_{t-1} + \sum_{i=0}^{q4} \beta_5 \Delta LINFRS_{t-1} + \sum_{i=0}^{q5} \beta_6 \Delta GDPPC_{t-1} + \sum_{i=0}^{q6} \beta_7 \Delta DCPGDP_{t-1} + \mu_t \quad (6)$$

Table4. Long Run Estimation Parameters

Variables	Coefficient	Std. Error	t-Statistic	Prob.*
PSER	-0.587	0.140	-4.188	0.001
KOFG	2.038	0.308	6.614	0.000
LOG(INFRS)	-35.605	8.308	-4.285	0.001
GDPPC	0.004	0.005	0.714	0.485
DCPGDP	-1.539	0.346	-4.452	0.004
LOG(FDI)	0.307	1.833	0.166	0.869
C	179.194	31.398	5.707	0.000

The equation is:

$$POV = 179.194 - 0.587PSER + 2.038KOFG - 35.605LOG(INFRS) + 0.004GDPPC - 1.539DCPGDP + 0.307LOG(FDI).$$

The above result showed that all the variables had significant impact on poverty rate in Nigeria expect GDPPC and FDI. Furthermore, the result revealed that PSER, INFRS and DCPGDP had negative impact on poverty while KOFG, GDPPC and FDI had positive impact of poverty.

4.5. Short Run Analysis

The short run and error correction model (ECM) is estimated with equation () below

$$\Delta POV_t = \beta_0 + \sum_{i=1}^p \theta_{1i} \Delta POV_{t-1} + \sum_{i=0}^{q1} \theta_{2i} \Delta KOFG_{t-1} + \sum_{i=0}^{q2} \theta_{3i} \Delta LFDI_{t-1} + \sum_{i=0}^{q3} \theta_{4i} \Delta PSE_{t-1} + \sum_{i=0}^{q4} \theta_{5i} \Delta LINFRS_{t-1} + \sum_{i=0}^{q5} \theta_{6i} \Delta GDPPC_{t-1} + \sum_{i=0}^{q6} \theta_{7i} \Delta DCPGDP_{t-1} + \lambda ECT_{t-1}$$

Where ECT_{t-1} is the error correction term and it must be well defined that is negatively significant.

Table 5. Short Run Parameters and Speed of Adjustmnet

Variables	Coefficient	Std. Error	t-Statistic	Prob.*
D(KOFG)	-0.681	0.156	4.353	0.004
DLOG(INFRS)	-6.967	2.746	-2.537	0.021
D(GDPPC)	0.0152	0.004	3.598	0.002
D(DCPGDP)	-0.713	0.123	-5.799	0.000
DLOG (FDI)	1.152	0.343	3.361	0.004
CointEq(-1)*	-0.595	0.056	-10.614	0.000
R-squared	0.874	Mean dependent var	0.675	
Adjusted R-squared	0.837	S.D. dependent var	3.210	
Durbin-Watson stat	1.986			

The Table 5 above presents the short run (dynamics) results. The optimal lag combination for the models is obtained via Schwartz Information criterion (SIC).

From the above result the ECM term is well-defined, that is negative and statistically significant at 5% level. Its coefficient is -0.595 this implies that 59.5 percent of the previous year’s disequilibrium in poverty rate is been corrected by DCPGDP, GDPPC, INFRS and KOFG, that is nearly 59.5 percent of any disequilibrium in poverty rate is been corrected by the variables within one period (one year). The ECM result also shows the speed at which the model converges to equilibrium.

The results also revealed that Domestic Credit to the Private sector as a ratio of GDP had a negative significant impact on poverty rate in Nigeria. This implies that as more credit is been given to private sector for investment purpose the level of poverty reduces. This conforms to the apriori expectation.

In the same vein, the result showed that electric power consumption had negative significant impact on poverty rate in Nigeria. This implies that as more electric power is been consumed the rate of poverty would be reducing that is as more electric power is made available for consumption the numbers of small and medium scale enterprise that folded up due to lack of electric power would be revamped also, companies that have left the country due to lack of electricity power would like to come back establish in the country and more new companies would want to come and establish in Nigeria. This conform to the apriori expectation.

In addition, the result revealed that trade openness had negative significant impact on poverty rate in Nigeria. This implies that as the trade is being open and citizens transact business with other country without restriction the rate of poverty reduce.

Conversely, the result revealed that Gross Domestic Product per capita had positive significant effect on poverty rate in Nigeria. This implies that as GDP per person increases the rate of poverty would increase. This does not conform to the apriori expectation.

Lastly, the result revealed that foreign direct investment had positive significant effect on poverty rate in Nigeria. This implies that as foreign direct investment increases the rate of poverty would increase.

Diagnostic Test

This study conducted diagnostic test to examine the reliability the results of the ARDL estimates.

The result of the normality test on figure 1 shows that the probability value of the Jarque-Bera statistics is greater than 5%, indicating that the residuals from the estimates are normally distributed. The heteroskedasticity (ARCH test) also showed (see tables 6) reveals that the residuals are not Heteroskedasticity. Also, table 5 the result of Breusch-Godfrey Serial correlation test revealed that there is no serial correlation or autocorrelation in the model.

Table 5. Result of Diagnostic Test

Heteroskedasticity	Test:	F-Statistics	Prob. F(1,31)	0.4139
Breusch-Godfrey Serial		0.920363		
Breusch-Godfrey correlation test	Serial	F-Statistics	Prob. F(2,15)	0.3028
		1.295202		
Ramsey RESET Test		F-Statistics	Prob. F(1,16)	0.9636
		0.002143		

5. Conclusion

This study investigated the effect of trade openness on poverty reducing in Nigeria between 1985 and 2020. The study revealed from the previous empirical literature that there is no consensus on the impact of trade openness on poverty reduction, so the need to investigate further. The Bound test revealed that the variables co-integrate that is there is both long run and short run relationship between the variables. Based on the regression analysis, the result showed that KOFG, INFRS and DCPGDP had negative impact on poverty reducing in Nigeria while GDPPC had positive impact on poverty reduction in Nigeria. Since DCPGDP had negative impact on poverty that is when more credit is given to private sector which would encourage establishment of more industries and consequently reduce poverty therefore this study recommend that more credit should be given to private sector. Also, since INFRS had negative effect on poverty, therefore government should intensify effort to increase electricity power available for consumption and therefore poverty would be reduced. In addition, since trade openness reduces poverty, the economy should be made more open to allow exportation of goods produced by the poor in order to further reduce poverty. Finally, as revealed in the study GDP per person increased poverty so there is need to redistribute income to reduce inequality between the rich and the poor

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