The Causal Effect of International Trade on Poverty in West Africa

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Abstract

The study examined the relationship between trade and migration and poverty and income inequality in the West African sub-region. The study included all the 16 countries within the West African bloc. The study adopted approaches such as pooled OLS, Fixed Effect models, PPML, two-stage least square instrumental variable estimator and PPML-2SLS. The study explored the correlation between international trade and poverty and also evaluated the effect of international trade on poverty and inequality in West Africa. The result indicated that there was negative correlation between international trade and poverty. In addition, it was observed regional trade flows reduce headcount poverty in the sub-region. The recommends that there should be liberalization in the subregion as that results in reduction in poverty. It will be worth exploring the link between trade and illegal migration on macroeconomic indicators of countries in the sub-region

Keywords: Povert, Income Inequality, International trade, Migration, Dummy Variable

1.   Introduction

Worldwide extreme poverty surged in 2020 after decades of stability for the past two decades. The interruption of the Covid-19 epidemic deepened the elements of conflict and climate change, which were in the motion of decelerating poverty. According to the World Bank (2020), about 120 million extra persons live in poverty due to the epidemic, with the projected increase to about 150 million by the close of 2021. Africa, the region with the most significant figures of extremely poor, witnessed a doubling of its population from 1990 to 2015. One of the most considerable population growths was those living on less than \$3.20 and more than \$1.90. The poor were beset with several challenges such as consumption levels and poor educational access (World Bank, 2020).

Since ancient times, international trade has been a crucial factor for developing economies, particularly in the long period (Fukuda, 2019; Winters et al., 2004), even during periods of difficulty (Falvey et al., 2012). Trade offers developing economies chances to accelerate economic growth, welfare improvement, and poverty reduction, largely West African significant exports are labor-intensive goods such as agricultural and essential industrial goods (Vo & Ho, 2021). Having few trade challenges, local markets are expanded with various goods and healthier alternatives in price and quality.

Notwithstanding, Africa continues to be a small actor in the world commodity trade. Africa's overall trade in respect to the world average US\$ 760 billion in the period 2015-2017, equated with \$481 billion from Oceania, \$4109 billion from Europe, \$5140 billion from a \$6801 billion from Asia (UNCTAD, 2019). From 1990 to 2015, the region's poverty profile of poverty has transformed substantially. In 2015, more than half of the world's poor lives in SSA, and more than 85% of the poor lived in Africa and South Asia. This indicates an evidential change from 1990 when more than half of the poor were in East Asia and the Pacific (World Bank, 2018). A likely reason for the progress in reducing poverty in the world is globalization. Globalization is linked with more trade openness (Nooruddin & Simmons, 2009) and a global labor market that has enhanced people's movements (Ehrhart et al., 2014). Moreover, trade has unclear influences on poverty and inequality at the regional level, especially in Sub-Saharan Africa (Perera et al., 2014). For that matter, this study focused whether there is a causal effect of international trade on poverty in the West African Sub-region.

1.1 Research Objectives

This study examines the impact of trade has on regional level poverty in West Africa.

The specific objectives are;

1. To explore the correlation between international trade and poverty in the West African region.

2. To evaluate the effect of international trade on poverty and inequality in West Africa

1.2 Significance of the Study

The question of the contribution of trade effect on poverty continuous to linger. This study evaluates the causal impacts of trade on poverty. It assesses which trade as a viable option for poverty reduction and bridging the inequalities in society. This study throws more light on the trade issue in West Africa. Besides, the results offer practical evidence to encourage freer trade or more unrestricted movement of individuals to reduce poverty and inequalities in the continent. This is bound to impact the various countries way of treating their countries border walls for trade.

2. Literature Review

Trade-driven economic growth and development is an appealing remedy to lessen poverty and inequality. However, previous studies have seemed to produce mixed findings in countries and various regions of the world (Perera et al., 2014; Adeleye et al. 2020). A lack of direct evidence connecting trade and poverty has made the suggestion challenging to estimate. This has led to ongoing debate and research, especially after Africa's structural adjustment and trade liberalization.

The likely impact of trade on the poor is typically grouped under three processes (Winters et al., 2004). First, trade can inspire growth and reduce poverty. Secondly, trade restructurings can hurt government returns, the primary basis of restructuring. But existing literature shows that restructurings do not lessen returns since they result in larger trade quantum and increases accumulation rates. Thirdly, trade can impact the amount poor individuals pay for products, prices they receive for their goods, and their job forecasts and pays.

2.1 The Gravity Model of Bilateral Trade

The gravity model has been the practical tool in analyzing the drivers of most two-sided trade flows. This is pioneered in international trade by Pöyhönen (1963) and Tinbergen (1962). In its elementary form, the gravity model assumes that trade between nations can be likened to the gravitational force between two items: it is unswervingly linked to a nation's size and negatively to the distance between them (Kalirajan, 2008). The gravity model of international trade is usually of the form:

$$V_{ij} = A \times (S_i \times S_j) / D_{ij}$$

where, V_{ij} is the trade volume between country i and country j; S_i is the size of the country i's economy; S_j is the size of the country j's economy; D_{ij} is the distance between i and j; and the constant A acts as an aggregate of all independent variables that influence V_{ij} (Feenstra & Taylor, 2021).

The predominant interpretation of the gravity model is that larger economies import more goods because it has a higher income and export more goods, as it produces a greater variety of goods (Krugman et al., 2018). Moreover, one can interpret distance as accounting for transportation and other related costs (Bowen et al., 2012). In essence, this study considers distance as a dummy variable that could influence trade in poverty reduction and affecting the price of the export country or import nation. It therefore concludes that nations that are able to export more goods are able to generate more income however, such income could be influenced by the distance.

3. Research Methodology

3.1 Research Design

The study adopted a panel data set. This takes into account various countries in the subregion for a period of thirty years; that is, 1990 to 2020.

3.2 Types and Sources of Data

The study adopted a secondary data in the collection of data. The panel data was used in this study. The secondary data for the analysis span from 1990 to 2020 and were obtained from World Bank, IMF, UNDP and WDI. It

involved a thirty-year period from 1990 to 2020. The variable used includes secondary education, distance, FDI, GDP, population, unemployment, landlocked, and average tariff, international trade and poverty count.

3.3 Model Specification

The aim of objectives 2 is to investigate the effects of trade on poverty and inequality. The duo regression model was estimated using poverty, as regressands. The baseline model specification, in natural logarithms, is;

$$ln\, Y_{it} = \varphi_0 + \varphi_1 \ln TRADE_{it} + \varphi_2 X_{it} + \varepsilon_{it} \qquad (1)$$

where i denotes nations and t represents years. Y is the regressand (poverty rate or Gini index). $TRADE$ is an indicator of trade intensity. X denotes a vector of control variables and ε is an idiosyncratic error term. φ_1 and φ_2 are the parameters to be estimated.

3.4 Estimation Procedure

The panel data employed is unbalanced. The three basic models are selected (Pooled OLS, Fixed Effects, and Random Effects). The Pooled OLS being basic and simple, is employed first in the estimations. However, Wooldridge (2019) did indicate that when the explanatory variables are correlated with the dependent variable, pooled OLS outcomes may still be valid. As there is a pairing of the countries, the estimates of the pooled OLS will be biased as the error term across countries is correlated and heteroscedastic because of omitted (and unobserved) time-invariant differences between countries. Thus, the adoption of robust standard errors in estimating the panel data models to account for both heteroscedasticity and autocorrelation. Moreover, the Hausman test is employed to choose between the Fixed effect and Random effect models.

4. Empirical Analysis

This chapter presents the results of the study and discusses them. The study begins with a summary statistic of the variable used in the study. It also discusses the correlation between trade and poverty/Gini. Finally, it explores the effect of trade on poverty.

4.1 Summary Statistics of Secondary Data

Table 4.1 presents the summary statistics of all the secondary data variables implored in this study. This was made up of a sample of 480 for the secondary data in the analysis. Various statistics include the mean, standard deviation, minimum and maximum. This provides a general picture of all variables employed using the mean and standard deviation. This makes the data easy to visualize and simple to follow. The headcount poverty ratio and Gini coefficient for inequality are 0.475 and 0.435, respectively.

Regarding the log of migration and trade flow, the averages within the sub-region are 5.732 and 16.197, respectively. The study also involved various control variables that are also logged. The FDI, GDP, and Unemployment log averages are 18.201, 21.856, and 1.473, respectively. The dummy variables of landlockedness, common language, and regional trade agreement are also employed, with averages of 0.188, 0.326, and 0.178, respectively.

4.2 Pearson Correlation

Table 2 shows the Pearson's correlation matrix of the variables employed in the study. Correlation analysis was conducted to, on the other hand, get insights on the interdependency among the dependent and explanatory variables and, on the other hand, test the hypothesis of the study. Generally, a moderate or low correlation among the explanatory variables is necessary to ensure that each variable is distinct and makes a unique contribution to the overall model. The results indicate that migration is positively associated with trade, FDI, GDP, population, and secondary education but negatively associated with unemployment and distance. On the other hand, trade is positively correlated with FDI, GDP, population and secondary education, unemployment, and distance. Poverty headcount within the sub-region is positively correlated with trade, while income inequality is negatively associated with migration and positively correlated with trade. This result clearly showed that there is a negative relationship between international trade and poverty headcount. The outcome provides an indication of strong negative correlation between international trade and poverty.

4.3 Effect of Trade on Poverty and Income Inequality

Table 3 shows the regression estimates of the effect of trade on poverty. Column 2 shows the pooled OLS, fixed effects (Column 3), and the causal determining two-stage least square estimation model (4) with only the second stage presented. The dependent variable is the poverty headcount rate at $US1.90 per day. All the variables are specified in natural logs, so the estimates can be interpreted as elasticities. Surprisingly the estimates for the pooled OLS differ from the other two models. The Fixed effect coefficients indicated that one percent higher trade flow is linked with a 0.074 percent decrease in the poverty rate.

For the control variables, the coefficient for FDI is positive and statistically significant. This implies that an increase in foreign direct investment in a country will increase poverty. This is likely to be the situation when most foreign multinationals tend to outsource the production and employ less labour as the rely more on sophisticated technology. Similarly, a percent increase in the population leads to a 1.479 percent increase in poverty. This is likely to be due to the increase in the number of people in the country with fixed resources to depend on to meet their living standards. The sign for secondary education deviates from expectation and is counterintuitive. This contradicts the findings of Migali and Scipioni (2019), who indicated that higher education is linked with better employment prospects and hence better incomes. The estimates of the pooled OLS are quantitatively different from the fixed effect model. This is not surprising and asserted by Cameron and Poot (2019) that estimated derived from the OLS and Fixed effect model cannot be compared directly as they differ in how the variables should be interpreted. More especially as the duo do not consider endogeneity in the estimations.

The causal choice model is the two-stage least instrumental variable estimate in column 4. The model indicates that a one percent increase in trade flow results in a 0.189 percent decrease in the poverty rate. The result also confirms the work of scholars such as (Pinkovskiy and Sala-I-Martin 2014; Radney et al 2012). Their study showed that a country with open market is able reduce the poverty rate in the country through the foreign receipt for economic growth. The work of Larke and Milanovic, (2013) indicated that international trade could lead to reduction in extreme poverty.

4.4 Policy Implications

The study findings encourage governments and decision-makers to desist from creating many trade barriers. More trade protection will lead to a decline in migrations flow. Given that regional and global trade is one of the key sources of wealth and welfare for nations, the findings kick against trade restrictions and limitations. Furthermore, it is critical for decision-makers to consider the impact of opening up their economies to more regional trade or migration, or a restriction of trade or migration, from the perspective of the effect on poverty and inequality in their nations.

5. Conclusion and Recommendation

Comprehending the effect of increasing trade and migration flow due to regionalism, especially in sub-Saharan Africa, is critical; more importantly, it affects poverty and inequality. In conclusion, regional trade and migration flow come with numerous opportunities such as investments and jobs. The outcome of the study therefore suggests that an increase in the movement of people might encourage trade from the origin to destination countries since migrants want easy access to familiar foods and other products. The study clearly showed that when international trade is well planned and competitive advantage is made to run in the West African setting, it will therefore lead to reduction on poverty and inequality within the subregion.

The study recommends that there should government effort to streamline trade among other countries to ensure a reduction both poverty and income inequality. That is where certain goods are to be tariffed to promote indigenous industries, the government and policy makers are to make conscious effort in establishing such policies. Whereas government must also be liberal in trading goods that could positively improve the economic position of its indigenes.

For further studies, it will be worth exploring the link between trade and illegal migration impact on macroeconomic indicators of countries in the sub-region.

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Table 1: Summary statistics

Variables	Observations	Mean	Std Deviation	Min	Max
Ln Headcount ratio	1680	0.475	1.262	0	4.253
Ln Gini ratio	1680	0.436	1.205	0	3.945
Ln Migration	1,680	5.732	4.179	0	14.134
Ln Trade	1,680	16.197	9.871	0	25.782
Ln FDI	1,680	18.201	2.106	10.597	22.519
Ln GDP	1,680	21.856	3.316	0	26.911
Ln Unemployment	1,680	1.473	0.775	0	2.668
Landlocked	1,680	0.188	0.390	0	1
Ln Population	1,680	15.757	1.319	12.731	19.144
Ln Distance	1,680	7.013	0.679	4.828	8.130
Ln Secondary Education	1,680	7.529	6.052	0	14.883
Common Language	1,680	0.326	0.469	0	1
Regional Trade Agreement (RTA)	1,680	0.178	0.390	0	1

Source: Author 2022; Computation based on information from World Bank, IMF and HDI.

Table 2: Pearson's correlations of the variables employed in the study

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Ln Headcount	1												
2	Ln Migration	-0.12	1											
3	Ln Trade	-0.69	0.11	1										
4	Ln FDI	0.1	0.15	0.35	1									
5	Ln GDP	0.07	0.12	0.33	0.39	1								
6	Ln Unemployment	0.16	-0.1	0.07	0.3	0.19	1							
7	Ln Origin Population	-0.04	0.31	0.31	0.6	0.52	-0.05	1						
8	Ln Destination Population	0.07	0.24	0.04	0.09	0.04	0.11	-0	1					
9	Ln Distance	-0.01	-0.6	0.04	0.07	0.04	0.02	0.02	0.02	1				
10	Ln Secondary Education	0.13	0.05	0.09	-0.1	0.11	-0.04	-0-0.05	-0.01	1				
11	Common Language	0.01	0.37	0.05	0.06	0.06	-0.09	0.18	0.18	-0.04	0.08	1		
12	Regional Trade Agreement	-0.05	0.12	-0.15	0.47	0.36	0.04	0.62	-0.04	0.06	-0.08	0.01	1	
13	Landlocked	-0.04	0.12	0.17	-0.06	0.09	-0.13	0.23	-0.02	0.01	0.18	0.15	-0.23	1

Source: Author 2022; Computation based on information from World Bank, IMF and HDI.

Table 3 Regression estimates on headcount poverty

	Pooled OLS		Fixed Effect		TSLS (Second stage)	
Variable	Coeff.	Robust SE	Coeff.	Robust SE	Coeff.	Robust SE
Ln Migration	0.066***	0.013	-0.066	0.056	-0.144*	0.081
Ln Trade	0.012***	0.004	-0.074**	0.023	-0.189**	0.072
Ln FDI	0.024***	0.002	0.034**	0.011	0.176**	0.073
Ln GDP	-0.039	0.048	-0.003	0.005	-0.003	0.055
Ln Unemployment	0.107***	0.036	-0.055	0.133	-0.058	0.081
Ln Population	-0.147***	0.026	1.479*	0.800	0.638***	0.173
Ln Secondary Education	0.024***	0.005	0.039*	0.018	0.000	0.018
Constant	0.890**	0.428	-20.776*	11.317	-5.463*	3.049
N	1,575		1,575		1,575	
R-squared	0.0790		0.1386		0.0708	