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Trade liberalisation, economic growth and poverty level in sub-Saharan Africa (SSA)

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ABSTRACT

This paper explores the relationship among trade openness, economic growth and poverty level in 40 sub-Saharan Africa countries from 1990 to 2017. Panel Autoregressive Distributed Lag (ARDL) model, Panel Vector Auto-regression (VAR) and the System of Generalised Method of Moments (SYS-GMM) were employed. A robustness test was also applied. The sensitivity analysis was done through the Panel ARDL model. The results revealed that trade openness, foreign direct investment and institutional quality significantly increase economic growth in the long term, while institutional quality reduces economic growth in the short run. Furthermore, trade liberalisation, institutional quality and population growth rate lead to poverty reduction in the long run, while trade openness has adverse effects in the short run. Moreover, poverty does not have a significant response to trade and growth shocks. Poverty presented a positive change but the level was not significant. The Pairwise Dumitrescu Hurlin Panel Causality results highlight feedback effects among trade, economic growth and poverty level in the region. Based on these findings, the study recommends that governments in Africa should reviewed their poverty reduction programmes in order to move towards achieving the sustainable development goals.

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1. Introduction

With the opening up of economies, African countries are able to access foreign aid, new technologies, international markets, etc. This integration of world economies is an important factor that promotes growth and reduces income inequality as well as poverty in the region. Such increased economic growth tends to boost national income and reduce the poverty rate. This also enables countries to remain competitive and reduces the number of people below the poverty line. Balogun and Dauda (2012) note that trade liberalisation creates jobs and business opportunities for the poor to raise their income levels. Trade liberalisation also increases economic growth (Shahbaz, 2008), thereby increasing the employment rate and reducing poverty. However, much of sub-Saharan

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Africa has experienced increasing poverty trends over the past few years. This is because liberalisation hurts employees in the domestic economy that are unable to adjust to the new and increasing competition, thereby affecting income and the equal distribution of wealth. Between 1990 and 2002 the fraction of SSA citizens living below the poverty line increased from 54.3 to 56.4 percent but has started reducing in recent years (World Development Indicators (WDI), 2019a). However, this poverty situation steadily decreased between 2010 (46%) and 2015 (41%).

Furthermore, progress has been less rapid and evident in Africa than it has been in developed countries. Many developing countries have a low income per capita such that a perfect distribution of income is impossible. According to Ali et al. (2018), liberalisation of trade means "the reduction in barriers to the movement of goods and services in the international market." Therefore, developing countries are forced to lower their barriers to trade in order to accommodate the international market and attract more foreign investments to the region, thereby contributing to increasing economic growth in these countries. However, the recent increased rate of economic growth is not sufficient to help the poor escape from poverty in import-based countries. This situation reflects the weakness of domestic producers vis-à-vis the external producers in the wake of global international trade. Recent studies such as Duncan and Quang (2003) and Mitra (2016) show that appropriate and complementary policies and institutions are important for the growth-poverty reduction nexus. Since trade policies are often necessary for achieving effective poverty reduction, this study fills a research gap in that regard.

As already noted, the gains from trade openness have not been enjoyed in many African countries, which have been unable to take advantage of the opportunities arising from a more globalised business environment; as such, poverty levels remain very high on the continent. Since this evidence predates major trade reforms, it is then imperative to study the effects of trade liberalisation on income growth. In developing countries such as SSA countries, it is also obvious that the gain from trade openness does not automatically translate into poverty reduction, as the high rates of trade and income growth do not explain the poverty level. By analysing the effects of trade liberalisation and economic growth on poverty levels in SSA, the present study seeks to fill a major gap in the literature. The paper evaluates the effects of trade liberalisation on economic growth as well as its effects on poverty levels in SSA countries. More importantly, this study throws more light on the transmission mechanism among trade, economic growth and poverty levels in SSA countries.

The study is structured into six sections. After this introductory section, Section 2 presents stylised facts on different variables in SSA countries, while Section 3 is a review of previous empirical studies. Section 4 articulates the data source and outlines the research methodology. The empirical results and discussions are shown in Section 5 while Section 6 concludes the study.

2. Stylised fact on trade liberalisation, economic growth and poverty level

Figure 1 shows that the trend of trade openness rose constantly between 1990 and 1995. Afterwards, there was an increase until 2015, before a decline occurred in 2017.

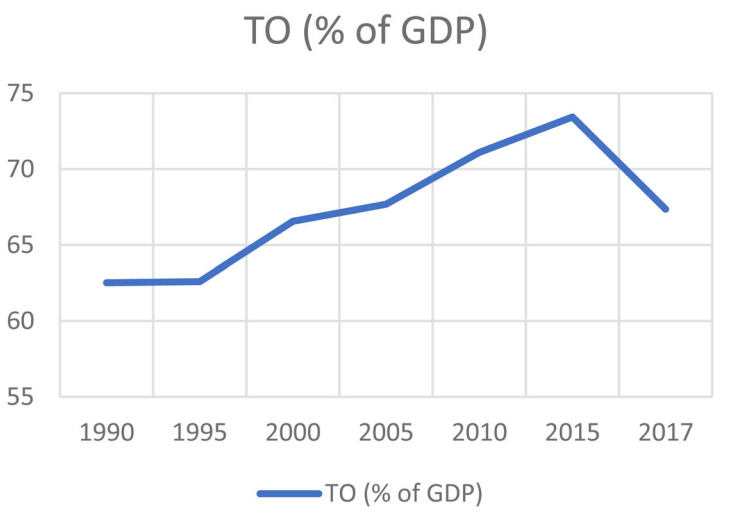

Figure 1. Trade Openness.

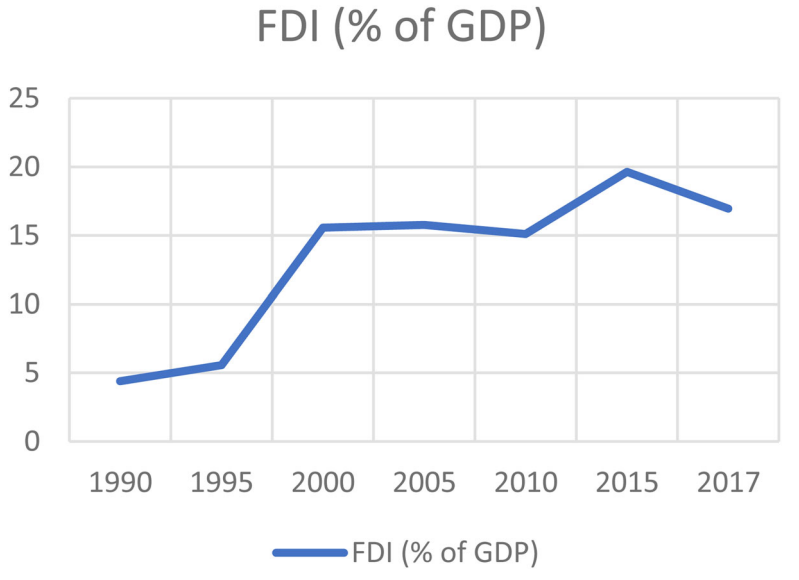

Figure 2. Foreign Direct Investment.

Figure 2 shows that FDI rose from 1990 to 2015, although there was a slight drop between 2005 and 2010, which was when the impact of the global financial crisis of 2008 was felt heavily in the developed world. In the developing world, the impact of the crisis was felt in terms of slight reduction of foreign capital, economic growth, etc. In sum, the statistics on trade openness and foreign direct investment reveal a high level of trade and foreign direct investment in the region. To be sure, trade and FDI are crucial to the region's development, as they are a source of the external capital that helps to raise domestic savings. They also help in stimulating economic growth through job creation and technology transfer.

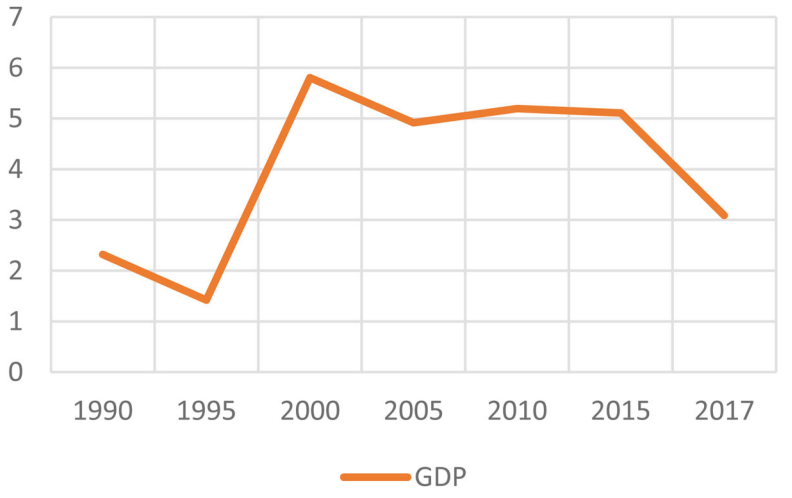

Figure 3. Economic Growth.

Figure 3 shows that economic growth has been on the rise since 1990, although with a slight drop in 1995. Between 1995 and 2015, economic growth increased but between 2000 and 2010, there was a drop in the income growth of SSA's countries, due mostly to the financial global crisis of 2008. Although GDP rose in SSA, its effect has not reflected in the region's development status, i.e., in terms of poverty reduction, income equality, employment rate, etc. In fact, the region has seen a rise in the employment rate and income inequality has worsened, thus leading to higher poverty levels. As Figure 4 shows, the poverty level has been on the rise since 1990 despite the different programmes put in place for poverty reduction in the countries. It is safe to suggest that this poverty trend underscores the weaknesses of the programmes and perhaps the institutions handling these programmes.

3. Literature review

According to international trade theories, countries focus on the production of goods and services for which they have a comparative advantage in order to increase their revenue from international trade. Based on the Stolper-Samuelson theorem, countries concentrate on the production of goods and services for which they have an abundant factor of production (Raihan, 2008). Such a situation increases the income growth level and reduces poverty. However, trade sometimes has adverse effects on growth, especially where there are more unskilled workers than skilled ones, as in the African case. Trade has different effects on the economy, for example, international price fluctuations. According to Williamson (2002), the poor may be "vulnerable to these induced effects in addition to changes in absolute and relative prices of wage goods." There is no doubt that inflation diminishes the gains of trade liberalisation, especially in terms of poverty reduction. On its part, the Heckscher-Ohlin (H-O) theory explains how trade can benefit countries, as it highlights differences in the trade-driving factor endowments between countries. As trade increases economic growth and welfare, this leads to poverty reduction in countries.

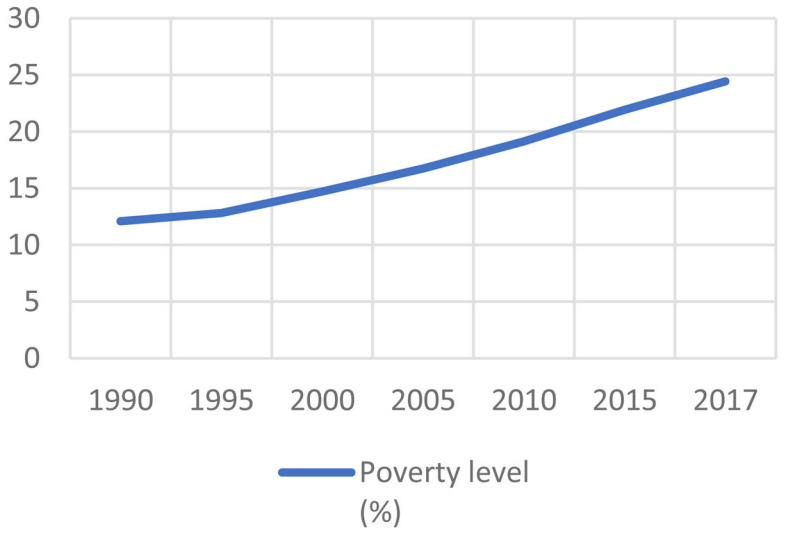

Figure 4. Poverty Level.

Dung (2004) assessed the connection among trade openness, income growth, poverty reduction and income inequality in Vietnam between 1997 and 2000. The author employed the Two Stage Least Square (2SLS) method and showed that trade openness increased economic growth and led to poverty reduction but increased income inequality in the country. Onakoya et al. (2019) employed pooled Ordinary Least Square (OLS) to investigate the impact of trade liberalisation on poverty in 21 African countries. The study covered the period between 2005 and 2014 and revealed that trade reduced poverty level in these countries. According to Ayinde (2013), trade liberalisation led to poverty increase and economic growth in Nigeria during the period 1970–2008. The study employed the Vector Error Correction Model (VECM) and suggested good macroeconomic policies and governance for the country to benefit from trade openness. Nyarkoh (2017) investigated the relationship between Ghana's trade and poverty level. Using the VECM model and the OLS method for the period 1960–2003, the study found that increasing trade led to poverty reduction in Ghana for both the short and long runs. Ali et al. (2018) assessed the link among trade openness, employment, economic growth and poverty reduction in Pakistan during the period 1971–2015. The study applied the Error Correction Method (ECM) and found a negative link between trade openness and income growth in the industrial sector, labour force and the inflation rate in the short term and a positive link with income growth in the agricultural sector. However, trade openness had positive effects on GDP in both sectors, labour force and inflation, while it had an opposite relationship with GDP in the long term.

Yusuf et al. (2013) investigated the link among trade openness, income growth and poverty reduction in Nigeria for the period 1980–2011. The study employed the ARDL model to show that trade liberalisation does not contribute to poverty reduction in Nigeria. Keho (2017) employed the ARDL techniques to examine the relationship between trade liberalization and economic growth in Cote d'Ivoire between 1965 and 2014. The findings revealed that trade increased economic growth both in short

and long-run. The Granger causality test also showed a unidirectional relationship between trade and economic growth. Modeste (2019) investigated the relationship between trade liberalisation, supply of export and poverty in Guyana over the period 1980–2010. The study employed quarterly data and the ARDL technique model for the analysis. The findings of the study revealed that trade increased the supply of exports while reducing the country's poverty level. Moreover, economic growth, agricultural sector growth and the real exchange rate contributed to poverty reduction and expansion of the country's supply of exports.

Using a panel fixed effects model, Trabelsi and Liouane (2013) investigated the effects of trade liberalisation on income inequality and poverty reduction in a sample of 106 developing countries over the period 1980–2010. The study findings revealed that trade liberalisation increased income inequality and, hence, the poverty level in these countries. Manwa et al. (2019) investigated the link between trade liberalisation and income growth in a sample of five Southern African Customs Union (SACU) countries, namely Botswana, Lesotho, Namibia, South Africa, and Swaziland. The study applied the panel fixed effects model, which revealed that trade insignificantly increased the growth of SACU countries over the period 1980–2011.

A study by Salimi et al. (2014) investigated the link among trade liberalisation, income growth and income inequality in 30 countries, using data that covered the period 2000–2011. The Generalized Method of Moments (GMM) was used to show that there is a feedback effect between trade liberalisation and income growth. Furthermore, the interaction between trade liberalisation and income growth decreased income inequality in these countries. In their own study, Le Goff and Singh (2014) investigated the link between trade liberalisation and poverty based on some specifications in a few African countries over the period 1981–2010. The system of GMM by Blundell and Bond (1998) was used to show that trade openness reduced poverty in countries where the environment was good (good institutions, financial development, education, health status, etc.). The study of Santos-Paulino (2017) employed the system-GMM model to explored the relationship between trade globalisation and poverty level for developing countries. Using the period from 1980 to 2014, the results showed that economic growth and manufacturing trade significantly reduced poverty while trade specialisation had adverse effects on poverty. Durongkaveroj and Ryu (2018) examined the effects of trade on poverty in Thailand. Using two-year data (1995 and 2005) from 76 provinces, the study showed that poverty reduced in provinces with more exposure to trade. Gnangnon (2018) employed the system of GMM to assess the impact of trade liberalisation on economic growth based on panel data of 150 countries for the period 1995–2015. The multilateral trade liberalisation index used in this study is similar to the "freedom to trade internationally" index. The results showed that multilateral trade liberalisation contributed to increased economic growth for that group of countries. Similarly, Gnangnon (2019) probed the effects of trade liberalisation in some developing countries for the 1996–2016 period. The results of the two-step system GMM showed that trade significantly contributed to poverty reduction.

Aremo (2014) investigated the link among trade, economic growth and poverty in Nigeria for the period 1980–2009. The study employed the VAR model for the

analysis. Two proxies for trade liberalisation were employed: openness and the trade liberalisation index. Poverty was proxied by the life expectancy variable, the level of employment and real consumption expenditure per capita. The findings revealed that economic growth increased trade liberalisation and reduced the poverty level in Nigeria. The results also showed that interaction levels among the macroeconomic indicators were very weak. The results therefore suggest that the domestic economic environment should be well structured and attention should be paid to the country's vulnerabilities to shock in implemented sound policies. Furthermore, Sani and Yunusa (2019) employed the VAR and VECM models to estimate the impact of trade openness on economic growth in Nigeria for the 1981–2016 period. The findings showed that trade and exchange rate increased economic growth in Nigeria. The Granger causality test did not reveal any relationship running from trade to economic growth.

The empirical studies have not yet conclusively shown the positive link between trade and economic growth and the adverse effects when considering poverty. One of the reasons may be the lack of consistency in the use of different trade openness and poverty indicators. Consequently, the present study attempts to fill this gap by using the most widely recognised indicators of the regressors. Moreover, most of the studies did not treat the issue of transmission mechanisms among trade openness, economic growth and poverty, as done in the present study.

4. Theoretical framework and research methodology

4.1. Theoretical framework

So far, no theoretical framework has been able to capture the effects of trade, growth and the poverty level. To be sure, however, growth is important and key to linking the two variables of trade and poverty. In other words, trade openness increases economic growth and poverty reduction, which also occurs via economic growth, such that the study adopts the Solow growth model used in Salimi et al. (2014). The Solow growth model is used here to capture the effects of trade openness on growth and is articulated here by the Cobb-Douglas function, as shown in the following model:

$$Y_{it} = \mathrm{f}(K_{it},\ \mathrm{A}_{it}\mathrm{L}_{it}) \text{ with } A_{it} = A_0 e^{gt} \tag{1}$$

where Y_{it} is economic growth, K_{it} represents capital stock, L_{it} stands for labour stock and A_{it} captures the technological factor. Also, i and t imply country i at time t, while g is a set of variables that affects the technological progress level. Using the logarithmic form gives us the following model:

$$lnY_{it} = lnA_{it} + lnK_{it} + lnL_{it} + \mu_{it} \tag{2}$$

In this study, we suppose that K_{it} represents trade openness and L_{it} represents employment rate (number of workers). Technological progress is composed of institutional quality. Replacing K_{it}, L_{it} A_{it} give the following model:

$$lnY_t = lnTO_{it} + lnIQ_{it} + lnER_{it} + lnPOP_{it} + \mu_{it} \tag{3}$$

Endogenous growth theory has provided a framework for the analysis of the relationship between trade strategies and economic growth. This theory has provided a relationship between trade liberalisation and increase in economic growth. Removing of barriers are expected to promote technology transfers, foreign investment and aid, which motivate growth. According to some authors, like Romer (1992), Barro & Sala-I-Martin (1995), Baldwin and Forslid (2000), countries that are more liberalised, have greater capacity to attract higher technologies. This is likely to speed up economic growth. Following this, the endogenous equation that also accounts for the effects of trade openness on poverty is adopted from Dung (2004). The endogenous growth theory explains the growth of the economy through internal forces that create spill-over effects on other sectors of the economy:

$$y_t \equiv \frac{Y_t}{A_t H_t} = \frac{Y_t}{A_t G_t L_t} \tag{4}$$

where y_t represents poverty rate and Y_t captures economic growth and trade openness. H_t is the human capital captures by number of workers L_t, and G_t a is productivity factor that also represents the poverty, education, health, etc … vectors.

4.2. Data source and model specification

This study utilises data on 40 out of the 48 countries in sub-Saharan Africa. The main variables of interest are trade liberalisation (% of GDP) proxied by trade openness (TO), economic growth proxied by per capita GDP (constant 2010 GDP) and poverty (number of people under the poverty line) proxied by the poverty headcount ratio (HC). Furthermore, these indicators are supposed to affect and be affected by each other. Since the domestic environment is important in reducing the poverty level through the spill-over effects of income growth (GDP) and trade liberalisation, some other variables are needed for achieving this objective. These control variables are foreign direct investment (FDI), institutional quality proxied by rule of law (RL) and control of corruption (CC), employment rate proxied by labour force (ER) and population growth (POP). The data for the estimation are drawn from the World Bank poverty database (POVCAL) and the World Bank Database (WDI and WGI), covering the period 1990–2017. The choice of the period is based on the fact that most of these African countries started trading with other foreign countries around 1990 (Table 1).

As in Ali et al. (2018), the study needs to build a system of simultaneous equations that shows the interdependence of the variables. The following two equations are presented in this study:

$$\text{Model I}: \text{GDP} = \text{f}(\text{TO},\ \text{FDI},\ \text{IQ},\ \text{ER},\ \text{POP}) \tag{5}$$

$$GDP_{i,t} = \alpha_0 + \alpha_1 TO_{i,t} + \alpha_2 FDI_{i,t} + \alpha_3 IQ_{i,t} + \alpha_4 ER_{i,t} + \alpha_5 POP_{i,t} \tag{6}$$

Table 1. Description of Variables.

S/N	Indicator Name	Symbol	Measurement	Source
1	Trade Liberalization	TO	Sum of import and export as % of GDP.	Work Bank (2019a)
2	Gross Domestic Product	GDP	Expressed in constant 2010 US dollars divided by population.	Work Bank (2019a)
3	Poverty	HC	Number of people below the poverty line	POVCAL (World Bank), 2019
4	Foreign Direct Investment	FDI	Net inflows of foreign investment expressed as a ratio of GDP.	Work Bank (2019a)
5	Rule of Law	RL	Degree to which the private entrepreneurs are confident in the judicial process to adjudicate cases without prejudice.	Work Bank (2019b)
6	Control of Corruption	CC	Degree to which public officers exercise public power for private gain. A lower value indicates a high value of corruption.	Work Bank (2019b)
7	Employment Rate	ER	The number of people who are currently working and people who are unemployed but seeking work.	Work Bank (2019a)
8	Population Growth	POP	The number of people living in sub-Saharan Africa irrespective of citizenship status.	Work Bank (2019a)

Source: Author's compilation.

Using the logarithmic form gives the following equation:

$$gdp_{i,t} = \alpha_0 + \alpha_1 to_{i,t} + \alpha_2 fdi_{i,t} + \alpha_3 rl_{i,t} + \alpha_4 cc_{i,t} + \alpha_5 er_{i,t} + \alpha_6 pop_{i,t} + \varepsilon_{i,t} \tag{7}$$

$$\text{Model II} : \text{POV} = \text{f}\ (\text{TO},\ \text{GDP},\ \text{FDI},\ \text{IQ},\ \text{ER},\ \text{POP}) \tag{8}$$

$$POV_{i,t} = \beta_0 + \beta_1 TO_{i,t} + \beta_2 GDP_{i,t} + \beta_3 FDI_{i,t} + \beta_4 IQ_{i,t} + \beta_5 ER_{i,t} + \beta_6 POP_{i,t} \tag{9}$$

Using the logarithmic form gives the following equation:

$$pov_{i,t} = \alpha_0 + \alpha_1 to_{i,t} + \alpha_2 gdp_{i,t} + \alpha_3 fdi_{i,t} + \alpha_4 rl_{i,t} + \alpha_5 cc_{i,t} + \alpha_6 pop_{i,t} + \varepsilon_{i,t} \tag{10}$$

Following this, the study adopts the system of GMM by Arellano and Bover (1995), which helps to control the individual and temporal-specific effects and to overcome the endogeneity bias of the variables. The GMM equations are described as follows:

$$gdp_{i,t} = \alpha_0 + \alpha_1 to_{i,t} + \alpha_2 fdi_{i,t} + \alpha_3 rl_{i,t} + \alpha_4 cc_{i,t} + \alpha_5 er_{i,t} + \alpha_6 pop_{i,t} + \alpha_7 gdp_{i,t-1} + \varepsilon_{i,t-1} \tag{11}$$

$$pov_{i,t} = \alpha_0 + \alpha_1 to_{i,t} + \alpha_2 gdp_{i,t} + \alpha_3 fdi_{i,t} + \alpha_4 rl_{i,t} + \alpha_5 cc_{i,t} + \alpha_6 pop_{i,t} + \alpha_7 pov_{i,t-1} + \varepsilon_{i,t-1} \tag{12}$$

where $gdp_{i,t-1}$ and $pov_{i,t-1}$ are the lagged values of the dependent variables, while others remain the same.

The study also adopts the Autoregressive Distributed Lag (ARDL) bounds test of Pesaran et al. (2001) for robustness check, as it also brings out the long-run relationship among the variables. The rationale for choosing this method is that it is suitable for any level of stationarity. The dynamic panel ARDL model is given as:

$$\Delta Y = \alpha_0 + \alpha_1 t + \gamma_1 y_{i,t-1} + \sum_{i=1}^{k} \emptyset_1 v_{i,t-i} + \sum_{j=1}^{k} \emptyset_j y_{i,t-j} + \sum_{i=1}^{N} \sum_{j=1}^{P} \varphi_{ij} \Delta v_{i,t-j} + \mu D_{i,t} + \varepsilon_{i,t} \tag{13}$$

Following the ARDL general model, the following models are expressed as follows:

$$\begin{aligned} \Delta gdp = {} & \alpha_0 + \sum_{i=1}^{P} \alpha_1 \Delta gdp_{i,t-i} + \sum_{i=1}^{P} \alpha_2 \Delta fdi_{i,t-i} + \sum_{i=1}^{P} \alpha_3 \Delta rl_{i,t-i} + \sum_{i=1}^{P} \alpha_4 \Delta cc_{i,t-i} \\ & + \sum_{i=1}^{P} \alpha_5 \Delta er_{i,t-i} + \sum_{i=1}^{P} \alpha_6 \Delta pop_{i,t-i} + \alpha_7 gdp_{i,t-1} + \alpha_8 to_{i,t-1} + \alpha_9 fdi_{i,t-1} \\ & + \alpha_{10} rl_{i,t-1} + \alpha_{11} cc_{i,t-1} + \alpha_{12} er_{i,t-1} + \alpha_{13} pop_{i,t-1} \end{aligned} \tag{14}$$

$$\begin{aligned} \Delta pov = {} & \alpha_0 + \sum_{i=1}^{P} \alpha_1 \Delta pov_{i,t-1} + \sum_{i=1}^{P} \alpha_2 \Delta to_{i,t-1} + \sum_{i=1}^{P} \alpha_3 \Delta gdp_{i,t-1} + \sum_{i=1}^{P} \alpha_4 \Delta fdi_{i,t-1} \\ & + \sum_{i=1}^{P} \alpha_5 \Delta rl_{i,t-1} + \sum_{i=1}^{P} \alpha_6 \Delta cc_{i,t-1} + \sum_{i=1}^{P} \alpha_7 \Delta pop_{i,t-1} + \alpha_8 pov_{i,t-1} + \alpha_9 to_{i,t-1} \\ & + \alpha_{10} gdp_{i,t-1} + \alpha_{11} fdi_{i,t-1} + \alpha_{12} rl_{i,t-1} + \alpha_{13} cc_{i,t-1} + \alpha_{14} pop_{i,t-1} \end{aligned} \tag{15}$$

In addition, the study, compared with previous studies, determines the transmission mechanism among trade, economic growth and poverty level.

5. Empirical results

5.1. Cross-sectional dependence

Table 2 presents the results of the cross-sectional dependence test and helps in deciding whether to use first- or second-generation panel unit root tests. To this end, three tests were performed: the Breusch-Pagan Lagrange Multiplier (LM), the Pesaran Scaled Lagrange Multiplier (LM) and the Pesaran Cross-sectional Dependence (CD). Evidence suggests to accept the null hypothesis of cross-sectional dependence at a 1% level of significance. This means that there is a certain level of dependence among sub-Saharan Africa countries, thus making the first-generation panel unit root tests appropriate for this study.

Table 2. Cross-sectional Dependence Tests.

Test	Statistic	Prob
Breusch-Pagan LM	4233.55***	0.0000
Pesaran scaled LM	87.4387***	0.0000
Pesaran CD	7.9315***	0.0000

***Significance at the 1% level.
Source: Author's Compilation.

5.2. Correlation matrix

The rationale of doing the correlation analysis is to avoid multicollinearity among the variables, since this may give spurious results. Table 3 reports the results of the correlation matrix.

The correlation analysis indicates a negative association among poverty, trade openness, foreign direct investment, rule of law and control of corruption. However, the analysis indicates a positive association among poverty, employment rate and population growth. This shows that the variables are not correlated, thus confirming there is no multicollinearity among those variables in this study. However, as suggested by the correlation matrix, there is a strong correlation between rule of law and control of corruption.

The study also employed the Variance Inflation Factor (VIF) as a correlation test to confirm the results of the latter test. The calculated VIF value is equal to 20, which is very high. This means there is multicollinearity among the regressors of the study, as confirmed by the multicollinearity among institutional quality variables. This informed the computation of an institutional quality index (EQ), using the principal components analysis (PCA) for robustness purposes. Thus, the highly correlated index between the poverty and employment rate variables lead us to drop the employment rate variable in model II.

5.3. Descriptive statistics

The descriptive statistics of the data appear in Table 4. On average, SSA's headcount ratio is 20.69%, trade openness equals 69.20% of the GDP and foreign direct investment is 3.99% of GDP. The minimum level of the population under the poverty line in SSA countries is 0.400 and trade openness equals to 19.10% of GDP. The Jarque-Bera shows that all the variables in this study do not follow a normal distribution.

5.4. Stationarity test

The stationarity test is carried out in order to avoid spurious analysis and to check if the data are not integrated of order 2. To examine the stationarity of regressors, the study applied the traditional unit root tests, i.e., Levin et al. (2002) (LLC), Im et al. (2003) (IPS), Augmented Dickey-Fuller (ADF) and Philips-Peron (PP), as presented in Table 5. The results reveal that FDI, income growth, inflation rate, control of corruption and population growth are stationary at levels. To arrive at stationarity for all the remaining variables, i.e. headcount ratio, trade openness, employment rate and

Table 3. Correlation Matrix.

	HC	TO	FDI	GDP	POP	ER	RL	CC
HC	1.0000							
TO	−0.3703	1.0000						
FDI	−0.0941	0.3185	1.0000					
GDP	0.0808	0.1129	0.4407	1.0000				
POP	0.0745	−0.1537	0.1312	0.2050	1.0000			
ER	0.9779	−0.3865	−0.0969	0.0971	0.0887	1.0000		
RL	−0.1736	0.1870	−0.0410	−0.0037	−0.4250	−0.1523	1.0000	
CC	−0.1945	0.1820	−0.0347	−0.0100	−0.5198	−0.1738	0.8879	1.0000

Source: Author's Compilation.

rule of law, the data were first differenced. Since some of the regressors are not stationary at levels, they are all stationary at first difference.

5.5. Cointegration test

The unit root test is followed by the cointegration tests, which are Engle-Granger based models. The Pedroni (1999), which is divided into two dimensions is employed. The within-dimensions shows the estimated statistics because the coefficients in the panel are pooled across every country, while the between-dimension, on the other side displays the results of the estimated statistics based on the mean of individually coefficient calculated for each country in the panel. Based on this, seven criteria from the Pedroni (1999) test are used to confirm the long-run association among the regressors (Table 6).

The results of the within-dimension cointegration show that both panel v and panel rho statistics are insignificant. However, both the panel PP and panel ADF statistics significant at 1% critical level. Moreover, the weighted statistic shows that both panel PP and ADF are significant at 1% critical level while the panel v and panel rho statistics are still insignificant. Therefore, for the within-dimension, we reject the null hypothesis of no cointegration since two of the four criteria are significant at 1% critical level. Furthermore, for the between dimension, all the criteria are significant at 1% critical level, except for group rho-statistic. Therefore, for economic growth model, we reject the null hypothesis of no cointegration and accept the alternative.

For the second model, the results of the within-dimension cointegration show that both panel rho and panel ADF statistics are insignificant. However, panel PP is statistics significant at 10% critical level and panel ADF statistics at 1% critical level. Moreover, the weighted statistic shows that both panel PP and ADF are significant at 1% critical level while the panel v and panel rho statistics are insignificant. Therefore, for the within-dimension, we reject the null hypothesis of no cointegration since two of the four criteria are significant. Furthermore, for the between dimension, all the criteria are significant at 5% critical level, except for group rho-statistic. Therefore, for poverty model, we reject the null hypothesis of no cointegration and accept the alternative.

For robustness purposes, the KAO cointegration test is used together with Pedroni test results to confirm the long-run relationship. The result of the KAO cointegration

Table 4. Descriptive Statistics.

Variables	Mean	Maximum	Minimum
HC	20.6974	190.8900	0.4000
TO	69.2041	170.4072	19.1008
FDI	3.9905	161.8238	−8.5894
GDP	4.8725	66.5800	−36.6999
ER	7890020.	59039086	134577.0
RL	−0.651632	1.0771	−2.1299
CC	−0.634865	1.2167	−1.8257
POP	2.6127	7.9178	0.0687

Source: Author's Compilation.

Table 5. Stationarity Test.

		Level		First Difference	
Variables	Test Criteria	Statistic	Probability	Statistic	Probability
Headcount Ratio	Levin, Lin & Chu t*	0.8062	0.8062	−15.0088***	0.0000
	Im, Pesaran and Shin W-stat	1.0000	1.0000	−11.0741***	0.0000
	ADF-Fisher Chi-square	0.9142	0.9142	301.593***	0.0000
	PP-Fisher Chi-square	0.0000***	0.0000	219.519***	0.0000
Trade Liberalization	Levin, Lin & Chu t*	0.03681	0.5147	−13.1526***	0.0000
	Im, Pesaran and Shin W-stat	−0.80117	0.2115	−17.5992***	0.0000
	ADF-Fisher Chi-square	91.0499	0.1871	445.157***	0.0000
	PP-Fisher Chi-square	120.83***	0.0022	766.625***	0.0000
Foreign Direct Investment	Levin, Lin & Chu t*	−16.7110***	0.0000	−19.0477***	0.0000
	Im, Pesaran and Shin W-stat	−9.14168***	0.0000	−22.0515***	0.0000
	ADF-Fisher Chi-square	191.213***	0.0000	557.709***	0.0000
	PP-Fisher Chi-square	276.608***	0.0000	1057.45***	0.0000
Employment Rate	Levin, Lin & Chu t*	−0.34091	0.3666	−10.2497***	0.0000
	Im, Pesaran and Shin W-stat	8.80535	1.0000	−6.69225***	0.0000
	ADF-Fisher Chi-square	27.7754	1.0000	184.196***	0.0000
	PP-Fisher Chi-square	81.3489	0.4369	143.356***	0.0000
Rule of Law	Levin, Lin & Chu t*	−1.23451	0.1085	−9.26799***	0.0000
	Im, Pesaran and Shin W-stat	−0.03580	0.4857	−9.21028***	0.0000
	ADF-Fisher Chi-square	79.6760	0.4892	231.647***	0.0000
	PP-Fisher Chi-square	103.407**	0.0403	483.468***	0.0000
Control of Corruption	Levin, Lin & Chu t*	−2.4845***	0.0065	−6.0742***	0.0000
	Im, Pesaran and Shin W-stat	−1.5699*	0.0582	−8.0396***	0.0000
	ADF-Fisher Chi-square	105.04**	0.0317	206.41***	0.0000
	PP-Fisher Chi-square	126.71***	0.0007	413.91***	0.0000
Economic Growth	Levin, Lin & Chu t*	−1.9722**	0.0243	−9.3487***	0.0000
	Im, Pesaran and Shin W-stat	−7.3368***	0.0000	−18.8941***	0.0000
	ADF-Fisher Chi-square	201.16***	0.0000	472.689***	0.0000
	PP-Fisher Chi-square	472.35***	0.0000	2368.95***	0.0000
Population Growth	Levin, Lin & Chu t*	−16.0179***	0.0000	−17.9707***	0.0000
	Im, Pesaran and Shin W-stat	−19.6563***	0.0000	−20.5625***	0.0000
	ADF-Fisher Chi-square	520.883***	0.0000	497.346***	0.0000
	PP-Fisher Chi-square	126.820***	0.0007	190.702***	0.0000

*Significance at 10% level,
**Significance at 5% level,
***Significance at 1% level.
Source: Author's Compilation.

test is presented in Table 7 and shows a long-run relationship among the variables at a 1% level of significance.

Having established the long-run relationship among the variables, using both Pedroni and KAO tests, the next stage is to analyse the empirical effects of trade liberalisation on economic growth (Model I) and the poverty level (Model II).

Table 6. Pedroni Cointegration Test.

Model I				
Within-Dimension				
Test Criteria	Statistic	Probability	Weighted Statistic	Probability
Panel v-Statistic	−4.5538	1.0000	−6.5971	1.0000
Panel rho-Statistic	3.5881	0.9998	3.4218	0.9997
Panel PP-Statistic	−10.3384	0.0000	−7.9059	0.0000
Panel ADF-Statistic	−6.3004	0.0000	−2.9822	0.0014
Between Dimension				
Test Criteria		Statistic		Probability
Group rho-Statistic		5.2734		1.0000
Group PP-Statistic		−19.0360		0.0000
Group ADF-Statistic		−3.2061		0.0007
Model II				
Within-Dimension				
Test Criteria	Statistic	Probability	Weighted Statistic	Probability
Panel v-Statistic	6.8898	0.0000	−12.5848	1.0000
Panel rho-Statistic	7.1058	1.0000	6.1188	1.0000
Panel PP-Statistic	3.5891	0.0998	−11.9666	0.0000
Panel ADF-Statistic	12.6262	1.0000	−23.7677	0.0000
Between Dimension				
Test Criteria		Statistic		Probability
Group rho-Statistic		9.9977		1.0000
Group PP-Statistic		0.3725		0.0449
Group ADF-Statistic		5.3161		0.0321

Source: Author's Compilation.

5.6. GMM results

The GMM model is used to analyse the short-run effects of trade liberalisation and economic growth on the poverty level, since the effects of poverty need to be tackled quickly and in the short term for the region to meet the conditions of sustainable development. This study uses the System of Generalised Method of Moments (SYS-GMM) to control the individual and temporal-specific effects and to overcome the endogeneity bias of the variables (Table 8).

In the first and second models, the results confirmed the underlying idea that trade liberalisation increases economic growth and contributes to increasing the poverty level in SSA countries. The results are similar to those of Yusuf et al. (2013), Sani and Yunusa (2019), and Manwa et al. (2019). These results show how much trade has a beneficial effect on the wealth of SSA countries. However, the results also show that trade has a negative effect on poverty reduction when the poor are unable to derive any benefits from opening up to trade. Furthermore, the results corroborate the failure of SSA's countries to diversify production and exports, that benefits to poor. Population and institutional quality lead to an increase in income growth, while institutional quality shows positive effects on poverty reduction. This analysis shows how institutions matter in reducing the poverty level in SSA. No doubt, a high

Table 7. KAO Cointegration Test.

	t-statistic	Probalbility
Model I	−1.824726***	0.0002
Model II	2.182288***	0.0003

***Significance at 1% level.
Source: Author's Compilation.

employment rate reduces economic growth, as it shows that domestic income growth may not be adequate for the population. An increase of 1% of labour force reduces economic growth and an increase of 1% of GDP significantly reduces poverty. However, the distribution of wealth, as shown in the effects of economic growth on poverty, is not enough in assuring better conditions of living in the region. When the employment rate is low in countries, there will be a fall in the production of goods and services and the productivity of the economy, ultimately leading to poverty increase. This scenario proves that high national incomes do not necessarily reduce the poverty level in countries. The results also show that foreign direct investment and institutional quality increase economic growth and contribute to reducing poverty in SSA countries. The spread of technology, external funding and creation of more jobs through FDI and good institutions explain its beneficial effects on poverty reduction in SSA countries.

5.7. Robustness check

A robustness analysis was used to confirm the results of the sys-GMM model, especially the short-run model. This study adopted the Panel ARDL approach for the robustness check, for both the short- and long-run results.

The results in Table 9 show that trade liberalisation, foreign direct investment and institutional quality significantly increased economic growth as expected in the long term, while institutional quality reduced economic growth in the short run. The results support the trade-led growth hypothesis and the neoclassical view of trade but not the J-curve hypothesis of Agénor (2004) where trade openness increases poverty in the short-run, while decreasing poverty in the long run. In particular, information flows and more liberal trade restrictions robustly relate to lower poverty. The results also corroborate those of Koffi et al. (2018), which found that trade reduced poverty level in Indonesia, as well as those of Salimi et al. (2014), Keho (2017), Sokang (2018), Ali et al. (2018), Gnangnon (2019), and Onakoya et al. (2019). Employment rate and population growth rate reduced economic growth in both the short and long runs. Thus, these facts highlight the importance of trade in an economy, as it has positive effects on increasing domestic income and leading to significant numbers of job opportunities in the economies of SSA countries. The effects of institutional quality indicate the role of institutions in ensuring a good index of economic development in the long run.

Further, trade liberalisation, institutional quality and population growth rate lead to poverty reduction in the long run. The possible explanation is that trade openness generates gains which increase growth in the long-run. The increase in growth translates to greater welfare that enhances living conditions, hence reducing poverty. This

Table 8. GMM Results.

	Model I		Model II	
	Economic Growth (GDP)		Poverty Reduction (HC)	
Explanatory Variables	Coefficient	Probability	Coefficient	Probability
GDP (−1)	0.1242***	0.0000	–	–
HC (−1)	–	–	1.0288***	0.0000
TO	0.0176*	0.0560	0.0007***	0.0000
FDI	0.2148***	0.0000	−0.0009***	0.0000
GDP	–	–	−0.0006***	0.0000
IQ	0.1923	0.6615	−0.0132***	0.0000
ER	−0.00001	0.1987	–	–
POP	2.0064***	0.0000	0.0893***	0.0000
Diagnostic Tests				
AR (2) Errors Test	Z Test (Prob.)	0.0639	Z Test (Prob.)	0.9928
Sargan Over-Identification Test	Chi-square (Prob.)	0.2478	Chi-square (Prob.)	0.4561
Wald Test	Chi-square (Prob.)	0.0000	Chi-square (Prob.)	0.0000

*Significance at 10% level,
***Significance at 1% level.
Source: Author's Compilation.

Table 9. Panel ARDL Results.

Dependent Variable: GDP and POV

	Model I: Economic Growth		Model II: Poverty Reduction	
Variables	Coefficient	T-Statistic	Coefficient	T-Statistic
Long-run				
GDP	–	–	0.0060	0.1148
TO	0.0210*	0.0930	−0.0115***	0.0000
FDI	0.2031***	0.0000	0.0137***	0.0000
IQ	1.5064***	0.0000	−0.1453***	0.0040
ER	−0.0003***	0.0000	–	–
POP	−0.0675	0.9401	−4.3824***	0.0000
Short-run				
Cointeq01	−1.0653***	0.0000	0.0202***	0.0000
D(TO)	0.0275	0.6028	−0.00007	0.9606
D(GDP)	–	–	−0.0002	0.4427
D(FDI)	0.02126	0.8851	0.0004	0.6641
D(IQ)	−0.9637	0.4435	−0.0029	0.5754
D(ER)	−0.0002	0.7789	–	–
D(POP)	−3.7347	0.7367	0.2049	0.4129
C	1.8107	0.3192	−0.2729***	0.0000

***Significance at 1% level,
*Significance at 10% level.
Source: Authors' Compilations.

may also explain why economic growth leads to poverty reduction in both techniques' procedure. The results are similar to those of Le Goff and Singh (2014), Nyarkoh (2017), and Le et al. (2019), which found that trade reduced the poverty level. Foreign direct investment, however, increases the poverty rate in SSA countries. This might be explained by the fact that FDI inflows are usually directed to projects that generate high profits and offer benefits directly or indirectly to the poor.

The results also indicate that the coefficients of the constant are 1.81 and −0.27, which implies that when all independent variables are held constant, the value of economic growth and poverty level are 1.81 and −0.27 respectively.

Table 10. Granger Causality Test.

	X^2	P-value
TO does not cause GDP	2.1600	0.3396
TO does not cause HC	5.9098*	0.0521
GDP does not cause TO	12.4248***	0.0020
GDP does not cause HC	5.7664*	0.0560
HC does not cause TO	0.5621	0.7550
HC does not cause GDP	2.6500	0.2658

***Significance at 1% level,
*Significance at 10% level.
Source: Authors' computations.

5.8. Transmission mechanism: the panel VAR results

To analyse the transmission mechanism among trade, economic growth and poverty level in SSA, the study applied the dynamic Panel Vector Auto-regression (PVAR). The PVAR was estimated by ordering the dependent variables with a vector of independent variables. It was used to investigate the interrelations among trade, economic growth and poverty level in SSA. The PVAR model includes three variables: trade openness, economic growth and poverty.

This is based on the assumption that a shock or innovation to trade will be transmitted to the income growth and poverty levels. The researcher also checked for the appropriate order of selection that gives a model with the least AIC. According to the results, the optimal lag is observed at a lag order of four. The PVAR was estimated in order to test for causality and compute the Impulse Response Functions (IRFs) and the Forecast Error Variance Decompositions (FEVDs). The Impulse Response Functions (IRFs) show how the variables react to different shocks in the model, while the Forecast Error Variance Decompositions (FEVDs) show how a change in a variable is due to its own shock and how much it is due to shocks from other variables. Both the IRFs and FEVDs computations are useful in assessing how shocks to economic variables reverberate through a system.

The causality test is presented in Table 10 in order to track the direction of the causality. The results indicate that trade openness Granger-causes poverty in the region without feedback, implying than an increase in trade leads to increase in the poverty level at a 10% level of significance. The results refute to those of Sani and Yunusa (2019) who did not find evidence of causality between trade and economic growth. The findings also reveal a unidirectional causality running from economic growth to trade and poverty level at 1% and 10% levels of significance respectively. This indicates that economic growth is the main cause of trade flows and high poverty level in SSA countries. The results are opposite from those of Keho (2017) who found a unidirectional causality from trade to growth.

The estimated Impulse Response functions (IRFs) are shown in Figure 5. On the first row, the result suggests that trade responds positively to a shock in GDP but negatively to a shock in poverty level in the first period. It is however non-significant. As regards the response on the second row, TO and HC have an immediate and positive effect since the first year of the shock. The response becomes insignificant at the eighth period for trade shock. On the last row, the responses of HC to shocks on TO and GDP are insignificant. HC does not respond to trade shock in the first four

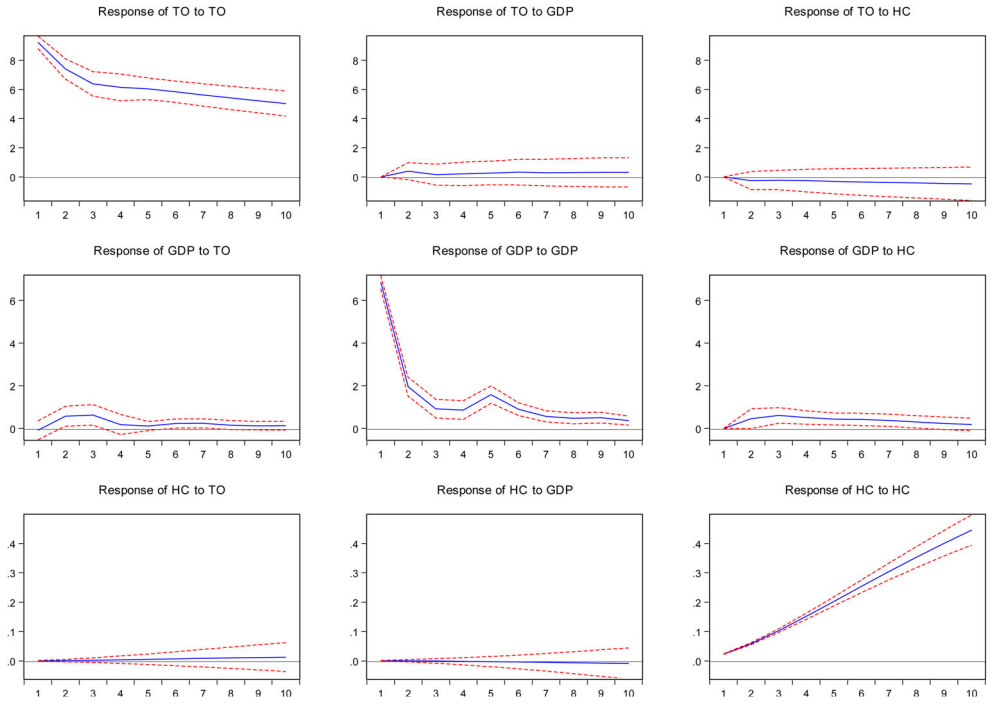

Figure 5. Impulse Response Functions. *Source*: Authors' Compilations.

periods. It presents a positive change but not significant. However, the response of poverty to GDP shocks becomes negative in the seventh period, and this continues to the tenth period although it is insignificant. All the responses are weak.

As presented below, the variance decomposition results reported within a 10-year horizon show that 99.52% of shocks in trade liberalisation are explained by their own past values, yet only 0.19% and 0.28% of the shocks are due to shocks to GDP and HC respectively. Moreover, 95.82% of shocks in GDP are explained by their own past values, yet only 1.59% and 2.58% of the shocks are due to shocks to trade liberalisation and HC respectively. Moreover, only 0.08% and 0.02% of changes in HC can be attributed to shocks due to trade liberalisation and GDP (Table 11).

6. Conclusion

The study analysed the effects of trade liberalisation on both economic growth and poverty reduction in sub-Sahara African countries over the period 1990–2017. The results showed that trade liberalisation, FDI and institutional quality significantly increased economic growth as expected in the long term, while institutional quality reduced economic growth in the short run. Furthermore, trade liberalisation, institutional quality and population growth rate led to poverty reduction in the long run, while trade openness had adverse effects. In addition, the Granger causality test showed that trade openness Granger-caused poverty in the region and there was unidirectional causality running from economic growth to trade and poverty level. The empirical results from the Panel Vector Autoregression (PVAR) model suggested no

Table 11. Variance Decomposition Results.

Period	Variance Decomposition of TO			Variance Decomposition of GDP			Variance Decomposition of HC		
	TO	GDP	HC	TO	GDP	HC	TO	GDP	HC
1	100.0000	0.0000	0.0000	0.0164	99.9835	0.0000	0.0062	0.0187	99.9749
2	99.8448	0.1099	0.0452	0.6476	98.9517	0.4006	0.0229	0.0076	99.9694
3	99.8392	0.0984	0.0623	1.3829	97.5353	1.0816	0.0437	0.0025	99.9537
4	99.8173	0.1010	0.0816	1.4173	97.0368	1.5458	0.0601	0.0062	99.9336
5	99.7793	0.1145	0.1061	1.3715	96.8163	1.8121	0.0705	0.0110	99.9183
6	99.7281	0.1369	0.1349	1.4386	96.4726	2.0887	0.0773	0.0152	99.9073
7	99.6829	0.1505	0.1665	1.5228	96.1640	2.3130	0.0816	0.0191	99.8991
8	99.6352	0.1633	0.2014	1.5547	95.9916	2.4535	0.0842	0.0226	99.8931
9	99.5838	0.1767	0.2394	1.5722	95.8950	2.5326	0.0854	0.0256	99.8889
10	99.5298	0.1901	0.2800	1.5955	95.8230	2.5814	0.0855	0.0281	99.8863

Source: Authors' Compilations.

evidence of interrelationship among trade liberalisation, economic growth and poverty level in SSA. The impulse response results showed that variables were less responsive to change; that trade and poverty were the channels through which economic growth transmitted to the economy; and that trade was also transmitted to the economy through poverty. Therefore, trade-related poverty reduction policies should be enacted so that people living below the poverty line can benefit from trade, since trade leads to poverty increase. Moreover, trade policies should be effectively implemented for growth in the region and most of the poverty programmes are to be reviewed in order to reduce poverty and move towards achieving the sustainable development goals. Since institutions are important in checking poverty levels, governments should aim to reduce the incidence of corruption in SSA countries while also improving the quality of institutions for the equal distribution of wealth and adoption of better policies.

Disclosure statement

No potential conflict of interest is reported by the authors.

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References

Agénor, P. R. (2004). Does globalization hurt the poor? *International Economics and Economic Policy*, *1*(1), 21–51.

Ali, T. M., Kiani, A. K., & Hafeez, M. (2018). Impact of trade liberalization on employment, poverty reduction, and economic development. *Pakistan Economic Review*, *1*(2), 83–104.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, *68*(1), 29–51. https://doi.org/10.1016/0304-4076(94)01642-D

Aremo, A. G. (2014). Trade liberalization, economic growth, and poverty level in Nigeria: Vector Auto-regression (VAR) Approach (1980–2009). *Journal of Economics and Behavioral Studies*, *6*(7), 591–606. https://doi.org/10.22610/jebs.v6i7.520

Ayinde, T. O. (2013). Trade liberalization, growth, and poverty reduction in Nigeria. *Journal of Economics and Sustainable Development*, *4*(18), 93–106.
Baldwin, R. E., & Forslid, R. (2000). Trade liberalisation and endogenous growth: A q-theory approach. *Journal of International Economics*, *50*(2), 497–517. https://doi.org/10.1016/S0022-1996(99)00008-2
Balogun, E. D., & Dauda, R. O. S. (2012). Poverty and employment impact of trade liberalization in Nigeria: empirical evidence and policy implications. MPRA Paper No. 41006.
Barro, R. J., & Sala-I-Martin, X. (1995). *Economic growth*. McGraw Hill.
Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8
Duncan, R., & Quang, D. (2003). *Trade liberalisation, economic growth and poverty reduction strategies*. National Centre for Development Studies.
Dung, C. X. (2004, September 16–17). *The impacts of trade openness on growth, poverty, and inequality in Vietnam: Evidence from cross-province analysis* [Paper presentation]. Conference Proceedings, Paper Prepared for the 53rd AFSE Congress, Paris.
Durongkaveroj, W., Ryu, T. (2018). Trade liberalisation and poverty: Evidence from Thailand. ARTNeT Working Paper Series, No. 180, June 2018, Bangkok, ESCAP. http://artnet.unescap.org
Gnangnon, S. K. (2018). Multilateral trade liberalization and economic growth. *Journal of Economic Integration*, *33*(2), 1261–1301. https://doi.org/10.11130/jei.2018.33.2.1261
Gnangnon, S. K. (2019). Does multilateral trade liberalization help reduce poverty in developing countries? *Oxford Development Studies*, *47*(4), 435–451. https://doi.org/10.1080/13600818.2019.1612866
Im, K. S., Pesaran, M., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, *115*(1), 53–74. https://doi.org/10.1016/S0304-4076(03)00092-7
Keho, Y. (2017). The impact of trade openness on economic growth: The case of Cote d'Ivoire. *Cogent Economics & Finance*, *5*(1), 1332820. https://doi.org/10.1080/23322039.2017.1332820
Koffi, S. L. Y., Gahé, Z. S. Y., & Ping, Z. X. (2018). Globalization effects on Sub-Saharan Africa: The impact of international trade on poverty and inequality. International Journal of Innovation and Economics Development, 4(3), 41–48. https://orcid.org/10.18775/ijied.1849-7020.2015.43.2005
Le, M. S., Su, J.-J., & Nguyen, J. (2019). Trade liberalisation, poverty, and inequality in Vietnam: a quantile regression approach. *Applied Economics*, *51*(36), 3971–3981. https://doi.org/10.1080/00036846.2019.1588943
Le Goff, M., & Singh, R. J. (2014). Does trade reduce poverty? A view from Africa. *Journal of African Trade*, *1*(1–2), 5–14. https://doi.org/10.1016/j.joat.2014.06.001
Levin, A., Lin, C.-F., & James Chu, C.-S. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of Econometrics*, *108*(1), 1–24. https://doi.org/10.1016/S0304-4076(01)00098-7
Manwa, F., Wijeweera, A., & Kortt, M. A. (2019). Trade and growth in SACU countries: A panel data analysis. *Economic Analysis and Policy*, *63*, 107–118. https://doi.org/10.1016/j.eap.2019.05.003
Mitra, D. (2016). Trade liberalization and poverty reduction. *IZA World of Labor*, *2016*, 272. https://doi.org/10.15185/izawol.272
Modeste, N. C. (2019). The impact of trade liberalization on export supply and poverty in Guyana: Evidence from cointegration analysis. *The Review of Black Political Economy*, *46*(3), 230–249. https://doi.org/10.1177/0034644619863553
Nyarkoh, B. J. (2017). Modelling trade liberalization-poverty nexus for Ghana. MPRA Paper No. 76209. https://mpra.ub.uni-muenchen.de/76209/.
Onakoya, A., Johnson, B., & Ogundajo, G. (2019). Poverty and trade liberalization: empirical evidence from 21 African countries. *Economic Research-Ekonomska Istraživanja*, *32*(1), 635–656. https://doi.org/10.1080/1331677X.2018.1561320

Pedroni, P. (1999). Critical values for cointegration tests in heterogenous panels with multiple regressors. *Oxford Bulletin of Economics and Statistics*, *61*(s1), 653–670. https://doi.org/10.1111/1468-0084.61.s1.14

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289–326. https://doi.org/10.1002/jae.616

Raihan, S. (2008). Trade liberalization and poverty in Bangladesh. Munich Personal RePEc Archive (MPRA) Paper No. 37905, 17 pp.

Romer, P. (1992). *Two strategies for economic development: using ideas and producing ideas* [Paper presentation]. World Bank Conference on Economic Development, The World Bank, Washington, DC.

Salimi, F., Akhoondzadeh, T., & Arsalanbod, M. R. (2014). The triangle of trade liberalization, economic growth and income inequality. *Communications on Advanced Computational Science with Applications*, *2014*, 1–15. https://doi.org/10.5899/2014/cacsa-00026

Sani, I. A., & Yunusa, A. A. (2019). Impact of trade liberalisation of agricultural sector on economic growth in Nigeria: An empirical investigation. *EAS Journal of Psychology and Behavioural Sciences*, *1*(1), 8.

Santos-Paulino, A. U. (2017). Estimating the impact of trade specialization and trade policy on poverty in developing countries. *The Journal of International Trade & Economic Development*, *26*(6), 693–711. https://doi.org/10.1080/09638199.2017.1291710

Shahbaz, M. (2008). A reassessment of finance-growth nexus for Pakistan: under the investigation of FMOLS and DOLS techniques. *Journal of Applied Economics*, *8*(1), 65–80.

Sokang, K. (2018). The Impact of foreign direct investment on the economic growth in Cambodia: Empirical evidence. *International Journal of Innovation and Economic Development*, *4*(5), 31–38. https://doi.org/10.18775/ijied.1849-7551-7020.2015.45.2003

Trabelsi, M. A., & Liouane, N. (2013). Trade liberalization and fight against poverty. *International Journal of Economics and Financial Issues*, *3*(2), 370–375.

World Bank (2019a). *World development indicators (WDI).* Washington DC: The World Bank. http://databank.worldbank.org/data.

World Bank (2019b). *Worldwide governance indicators (WGI).* Washington DC: The World Bank. http://data.worldbank.org/data-catalog/worldwide-governance-indicators.

Williamson, J. (2002). Winners and losers over two centuries of globalization. WIDER Annual Lecture No. 6. UNU-World Institute for Development Economics Research, Helsinki.

Yusuf, M., Malarvizhi, C. A., & Khin, A. A. (2013). Trade liberalization, economic growth and poverty reduction in Nigeria. *International Journal of Business and Management*, *8*(12), 42–47. https://doi.org/10.5539/ijbm.v8n12p42