Acta
Universitatis
Danubius

ŒCONOMICA

Is Trade Liberalization One of the Determinants of Poverty in Upper Middle-Income Countries?

Kunofiwa Tsaurai[1]

Abstract: This study examined whether trade openness is one of the determinants of poverty in upper middle-income countries using panel data (1991-2020) analysis methods such as fixed effects, pooled ordinary least squares (OLS) and fully modified ordinary least squares (FMOLS). Models 2 and 3 consistently produced results which show that trade openness reduced poverty in upper middle-income countries. The complementarity variables (1) trade openness and financial development and (2) trade openness and human capital development had a poverty reduction influence in upper middle-income countries. The study therefore urges the authorities in selected upper middle-income countries to craft and implement policies which further opens trade with other countries and which also enhances both human capital and financial development to alleviate poverty. A future study on the threshold levels of trade openness, human capital and financial development that significantly reduces poverty will add value to the existing literature.

Keywords: Poverty; Trade Liberalization; Panel Data; Upper Middle-Income Countries

JEL Classification: C23; F4; I3; P2

---

[1] Professor, Department of Finance, Risk Management and Banking, University of South Africa, South Africa Address: P.O. Box 392, UNISA 0003, Pretoria, South Africa, Corresponding author: tsaurk@unisa.ac.za.

1. Introduction

Sub-sections such as background, contribution and organization of the study are espoused under the introduction part.

Study's background: As one of the millennium development agendas of the United Nations, Rewilak (2017) noted that poverty alleviation reduces income inequality gaps, food handouts requirements from the government, school drop outs and unemployment. One of the factors argued by Goff and Singh (2014) to be instrumental in reducing poverty is trade openness or trade liberalization. Pradhan and Mahesh (2014) also noted that trade openness reduces poverty not directly but through channels such as economic growth, financial development and human capital development. What is notable in the theoretical literature on the impact of trade openness on poverty reduction is that there is generally an agreement that the former enhances the latter whether directly or indirectly. Consistent with Khan et al (2023), investigating the causes of poverty enables countries to formulate and implement policies that help to achieve the millennium development goals set out by the United Nations.

Several empirical researchers investigated the influence of trade openness on poverty alleviation and they produced results which are quite far from being conclusive, divergent, mixed and not congruent to each other. Some empirical researchers noted that trade openness reduced poverty, others observed that trade openness increased the levels of poverty whilst the other group showed that these two variables (trade openness and poverty reduction) affected each other. The other section of empirical researchers produced results which show that there are factors which must be available in the country before trade openness is able to reduce poverty. These factors include human capital development, financial development and economic growth, consistent with Roshan and Hashemi (2016). These inconsistencies in the results from prior similar empirical research urged the author to contribute on whether trade openness is one of the determinants of poverty in upper middle-income countries.

The empirical research work on the influence of trade openness on poverty reduction also is characterized by glaring methodological weaknesses. For example, majority of them focused on single country analysis, hence not able to tell a story about the influence of trade openness on poverty in an economic bloc of countries. Majority of them wrongly assumed that the relationship between poverty and trade openness in linear in nature. Majority of them used outdated data set. The influence of the complementarity variable on poverty is missing in most of the existing empirical literature on the subject matter. To the best of the author's knowledge, none of the existing empirical research on the influence of trade openness on poverty alleviation exclusively used upper middle-income countries as a focal point. All these gaps in the literature are filled in, in the current study.

Contribution of the study: This research contributed towards literature in five major ways. This study examined the conditions that must be available in upper middle-income countries to enhance trade openness's influence on poverty reduction. This is the first study of such a kind to focus on upper middle-income countries. The study examined the influence of the complementarity between trade openness and conditionalities (financial development, human capital development) on poverty in upper middle-income countries. Unlike prior similar research work, this study used most recent data (1991-2020). Majority of empirical research on the relationship between trade openness and poverty wrongly assumed that the two variables are linear in nature. This study took into consideration the fact that the relationship between trade openness and poverty is non-linear in nature.

Structure of the study: Section 2 presents the determinants of poverty. Section 3 describes both theoretical and empirical literature on the influence of trade openness on poverty. Section 4 describes and explains the control variables of the poverty function. Section 5 presents and describes the trade openness and poverty trends for upper middle-income countries. Research methodology was described in Section 6. Section 7 presents, describes and explains the final data analysis. Section 8 concludes the study. Section 9 is the reference list.

2. Determinants of Poverty – Literature Review

No defined theoretical literature exists on the determinants of poverty, consistent with Borko (2017). However, several empirical researches work exist on the factors which affects poverty (see Table 1).

Table 1. Summarized Empirical Literature – Determinants of Poverty

Researchers	Unit of analysis	Time frame	Methodology	Findings
Adeyemi et al (2009)	Sub-Saharan Africa (SSA)	2003 cross country data	Multiple linear regression	Factors which increased poverty in SSA were found to be population growth, safe water shortage, HIV and AIDS, inflation, gender discrimination, slow economic growth, religious and ethnic conflicts huge external debt.
Sekhampu (2017)	South Africa	Survey data	Logistic regression	Larger household size was observed to be the cause of poverty. Being employed and or being younger were found to have reduced poverty.

Usuka (2019)	India and South Africa	1990-2016	Descriptive statistics	Economic growth, good education, trade openness and health were found to reduce poverty in both countries.
Biyase and Zwane (2018)	South Africa	2008-2014	Fixed and random effects	Higher levels of education, trade openness and economic growth reduced poverty in South Africa. Urban areas and farming areas were found to be less prone to poverty
Borko (2017)	Ethiopia	2013 survey data	Logistic regression analysis	Factors which had a positive and significant impact on poverty include family size, household age, household head sex, marital status and dependency ratio.
Sugiharti and Primanthi (2017)	Indonesia	2012 survey data	Logistic regression analysis	Limited access to education and large number of household dependents increased poverty in Indonesia.
Cho and Kim (2017)	Rwanda	2010-2011 survey data	Probit model	High population growth, trade openness, good health and vibrant agricultural sector were found to reduce poverty in Rwanda.
Mukherjee and Benson (2003)	Malawi	1997-1998 survey data	Logistic regression analysis	Higher level of women education and involvement of more people into trade and services sector reduced poverty in Malawi
Rupasingha and Goetz (2007)	United States	2000 survey data	Spatial data analysis	The major determinants of poverty in United States include social capital, income inequality, unemployment and federal grants.
Misiunas and Binkauskiene (2007)	Lithuania	2006 survey data	Multiple regression analysis	Age, education, sex, trade openness, economic growth, and household size were found to be the major determinants of poverty.
Akerele et al (2012)	Nigeria	2005 survey data	Tobit regression model	Dependency ratio, trade openness, educational status, household assets and growth of the economy were found to be the influential determinants of poverty.

Spaho (2014)	Albania	2013 survey data	Logistic regression analysis, Log linear regression model	Small household size, booming tourism, trade openness, manufacturing and agricultural sector were found to be the key drivers of poverty reduction in Albania.
Khatun (2015)	Bangladesh	Survey data	Log linear multiple regression model	Variables that increases poverty were found to be insufficient income, inadequate access to education, lack of access to loans and public infrastructure.
Geda et al (2005)	Kenya	1994 survey data	Binomial logit model	Small household size, high educational level and agricultural activities had a poverty reduction effect in Kenya.
Olofin et al (2015)	Nigeria	Time series data (1990-2010)	Dynamic Ordinary Least Squares	Political terror increased poverty when real income per capita (poverty proxy) was differenced.
Owuor et al (2007)	Africa	Survey data	Descriptive statistics and multi-linear regression analysis	Access to finance, education, gender and access to markets were the major factors found to reduce poverty in the rural areas.
Majeed and Malik (2015)	Pakistan	2004 to 2007 survey data	Logistic regression model	Education was found to have a deleterious impact on poverty in Pakistan
Merid and Bekele (2019)	Ethiopia	Survey data	Binary logistic model	The household being headed by a male, owning a beehive, large oxen and large size of farmland reduced poverty in rural Ethiopia.
Azizah (2018)	Indonesia	Time series (2005-2014)	OLS	Human capital development had a poverty reduction effect in a non-significant way in Indonesia.
Chitsika (2015)	Zimbabwe, Chivi district	Survey data	Descriptive statistics	Cattle ownership, high level of ownership, small household size.

Source: Author Compilation

Empirical research on the determinants of poverty found out that trade openness is one of the determinants of poverty reduction. It is against this background that this

study decided to further explore the exact influence of trade openness on poverty in the case of upper middle-income countries.

3. Influence of Trade Openness on Poverty – Literature Review

There is defined theory on the impact of trade openness on poverty (Bannister and Thugge. 2001). Consistent with Goff and Singh (2014), the influence of trade openness on poverty is examined by finding out the various channels through which poverty is affected by trade openness. The easy access to international commodity and financial markets makes it faster for the domestic firms to expand, job creation, wealth and reduce poverty (Pradhan and Mahesh. 2014). High level of trade openness creates new international markets for domestic products and enhances the introduction of new products in the local economy. This is advantageous to the consumers who will be spoilt for choice, have more disposable income, employment creation and poverty reduction (Winters Et al. 2004). In line with Roshan and Hashemi (2016), trade openness enhances economic growth by attracting foreign direct investment, enabling domestic firms to actively participates in the international markets (selling their products and sourcing cheaper and better-quality inputs and raw materials) and bringing foreign currency. They further argued these benefits brought in by economic growth further allow companies to increase their domestic operations, creates employment and reduce poverty and income inequality. Although the channels-based literature agree that trade openness helps to reduce poverty, empirical literature on the subject matter produced mixed results (see Table 1).

Table 2. Empirical Literature Review - Influence of Trade Openness on Poverty

Author	Unit of analysis	Approach	Findings
Bannister and Thugge (2001)	Literature review analysis	Literature review analysis	Trade openness and liberalization were found to have a positive effect on both standard of living and poverty reduction efforts.
Pradhan and Mahesh (2014)	25 developing countries	Panel regression model	The study noted that stiff competition that comes alongside high level of trade openness might have a deleterious effect on domestic firms, leading to downsizing, retrenchments, high unemployment and increased poverty levels.

Sattar and Khan (2021)	Lower and middle-income countries	Dynamic panel ordinary least squares and fully modified ordinary least squares	Trade openness was found to have increased poverty levels in lower income countries. Financial development enhanced the influence of trade openness on poverty reduction in both lower and middle-income countries.
Goff and Singh (2014)	Africa	Panel data analysis	Trade reduced poverty in African countries characterized by developed financial sector, strong institutions and high human capital development levels
Agusalim (2017)	Indonesia	Vector Error Correction Model (VECM)	In the long run, trade openness enhanced poverty reduction whilst no meaningful influence of trade openness on poverty was observed in the short run.
Adha et al (2018)	Indonesia	Ordinary least squares (OLS)	Trade openness had a positive influence on poverty in Indonesia
Adegboyo et al (2021)	Nigeria	Autoregressive distributive lag (ARDL)	In the case of Nigeria, poverty reduction was enhanced by higher levels of trade openness
Figini and Santarelli (2006)	Developing countries	Panel data analysis	Trade openness was found to be associated with lower poverty levels
Winters et al (2004)	Literature review analysis	Literature review analysis	The literature noted trade openness generally lowered poverty.
Roshan and Hashemi (2016)	Iran	Systems equations method	Trade openness enhanced poverty reduction through other channels such as economic growth, financial development and human capital development.
Abate (2014)	Ethiopia	Random effect general least squares	Trade openness was observed to have exacerbated poverty in Ethiopia.
Gnangnon (2020)	Developing countries	Panel data analysis	Poverty levels were reduced by increased international trade in developing countries.
Fang and Qamruzzaman (2021)	South Asian countries	Non-linear ARDL and ordinary least squares	Feedback relationship between trade openness and poverty reduction in the South Asian countries.
Maku et al (2021)	Nigeria	ARDL	A declining influence of trade openness on poverty was observed in Nigeria.

Mbah et al (2022)	Nigeria	ARDL	Both in the short and long run, trade openness led to an increase in poverty levels in Nigeria.
Kelbore (2015)	Africa	System generalized methods of moments	A bi-directional relationship between poverty alleviation and trade openness was noted in the case Africa.
Qadir et al (2000)	Pakistan	Regression analysis	Poverty levels were reduced by the implementation of the trade reforms.
Mabugu and Chitiga (2007)	South Africa	Descriptive statistics	The dynamic effects of trade liberalization were found to have reduced poverty levels in the case of South Africa.
Chaudhry and Imran (2013)	Pakistan	ARDL	A non-significant poverty reduction effect of trade openness was observed in the short run. In the long run, the impact of trade openness on poverty reduction was more pronounced.
Ghazanfar et al (2021)	SAARC (Bangladesh, Pakistan, India, Sri Lanka)	ARDL	Trade openness and poverty were found not related in the short run whilst poverty was significantly reduced by trade openness in the long run.
Togo (2020)	Mali	ARDL	In the long run, poverty alleviation was enhanced by trade openness in Mali. Using life expectancy and consumption per capita as measures of poverty, poverty was exercabated by trade openness in the short run.
Bayar and Sezgin (2017)	Latin American countries	Panel data analysis	The complementarity between trade openness and financial development reduced poverty in the long run.

Source: Author

4. Control Variables of the Poverty Function

Access to small loans which helps the people to kick start their small projects is enhanced by a developed financial market (World Bank. 2001; Rajan and Zingales. 1998). Increased financial development makes the demands for collateral security when lending more pronounced thereby further ensuring that the poor people remains trapped in the vicious cycle of poverty (Boukhatem, 2016). Stock market capitalization (% of GDP) is the measure of financial development used. Poverty reduction is expected to be positively influenced by financial development.

Increased human capital development empowers the people with skills, good health and education (Chaudhry and Rehman. 2009). This increases the people's chances of getting a well-paying kind of employment, consistent with Afzal et al (2010). Human capital development index is the proxy of human capital development employed. Poverty is expected to be lowered by human capital development.

Early stages of economic growth are correlated with high poverty levels whilst poverty reduction is seen in later stages of economic growth (Kuznets, 1995). Poverty reduction becomes more pronounced when the country attains the middle-income status because at such level of economic growth and development, unemployment and inequality naturally decline. Gross domestic product (GDP) per capita is used as a proxy of economic growth in this study, consistent with Nuta et al (2023). The influence of economic growth on poverty is expected to be either way.

Infrastructural development led poverty increase is consistent with Pradhan and Mahesh's (2014) findings in the case of developing countries. However, developed infrastructure leads to clean energy, better access to health, education, clean energy, roads and easy and quick access to markets (Jahan and McCleery. 2005). The measure of infrastructural development used in this study is the fixed telephone subscriptions (per 100 people). It is expected that poverty can be affected by infrastructural development either positive or negative.

FDI reduces poverty through its ability to enhance human capital development and job creation (Romer. 1986). The same research observed that long term economic growth and development is negatively affected if a country over depend on FDI inflows. It is upon this basis that the study expects FDI to affect poverty either way. Net foreign direct investment inflows is the measure of foreign direct investment used for the purposes of this study.

The optimistic hypothesis put forward by Cattaneo (2005) and Anyanwu and Erhijakpor (2010) argued that remittances inflow increases the country's ability to enhance entrepreneurship, economic growth, self-employment and long-term poverty efforts. The same study warned against over depending on remittances as that could have a positively impacted poverty in the long term. Personal remittances

received (% of GDP) is used as a proxy of remittances in this study. Personal remittances are expected to influence poverty both ways.

Savings is the foundation upon a solid and sustainable poverty reduction programme is premised (Steinert et al. 2017). The return on investment in financial markets enhances people's wealth levels if inflation rates are low. Domestic savings (% of GDP) was used as a measure of savings. The expectation is that poverty is reduced by savings.

5. Trade Openness and Poverty Trends for Upper Middle-Income Countries

Argentina's trade openness increased from 13.75% of GDP in 1991 to 23.34% of GDP in 1997, went up by 17.31 percentage points during the period between 1997 and 2003 before declining by 6.59 percentage points during the subsequent six-year period, from 40.64% of GDP in 2003 to 34.06% of GDP in 2009 (see Figure 1). The period between 2009 and 2015 saw Argentina's trade openness going down by 11.57 percentage points before increasing by 7.66 percentage during the subsequent six-year period, from 22.49% of GDP in 2015 to 30.15% of GDP in 2020.

The period between 1991 and 1997 saw Brazil's trade openness reducing by 0.02 percentage points, increased by 11.56 percentage points during the period between 1997 and 2003 before going down from 28.14% of GDP in 2003 to 22.11% of GDP in 2009. Brazil's trade openness increased from 22.11% of GDP in 2009 to 26.95% of GDP in 2015 before further increasing by 5.40 percentage points during the period from 2015 to 2020 (from 26.95% of GDP in 2015 to 32.35% of GDP in 2020).
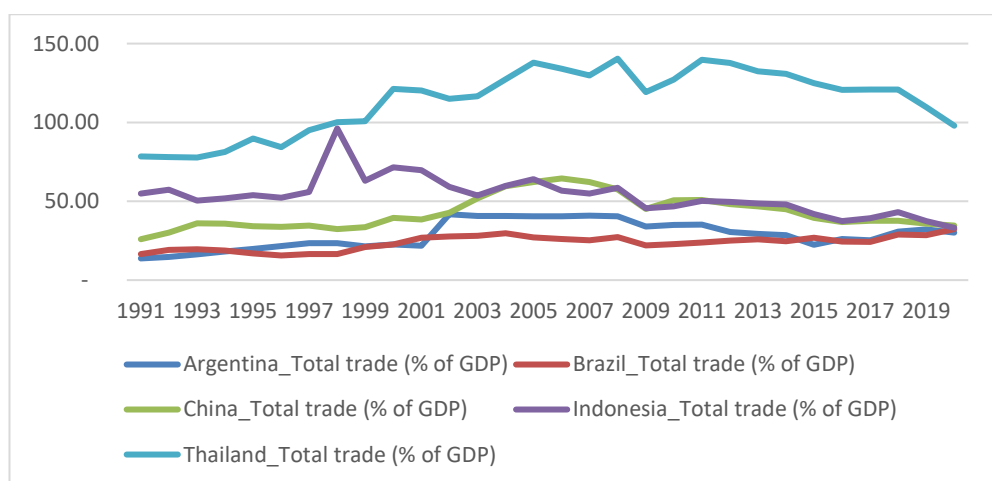

Figure 1. Total Trade (% of GDP) Trends for Selected Upper Middle-Income Countries

Trade openness for China went up from 25.95% of GDP in 1991 to 34.53% of GDP in 1997, increased by 17.27 percentage points during the subsequent six-year period ranging from 1997 to 2003 before declining by 6.62 percentage points during the period between 2003 and 2009. The period between 2009 and 2015 saw China's trade openness declining by 5.72 percentage points before further plummeting by 4.96 percentage points during the subsequent six-year period ranging from 2015 to 2020 (from 39.46% of GDP in 2015 to 34.51% of GDP in 2020).

Indonesia's trade openness increased from 54.84% of GDP in 1991 to 55.99% of GDP in 1997, declined by 2.38 percentage points during the period between 1997 and 2003 before further going down by 8.10 percentage points during the six-year period ranging from 2003 and 2009. Trade openness of Indonesia declined by 3.57 percentage points, from 45.51% of GDP in 2009 to 41.94% of GDP in 2015 and then decreased by a further 8.75 percentage points during the period ranging from 2015 to 2020.

Thailand's trade openness massively went up from 78.47% of GDP in 1991 to 95.05% of GDP in 1997, increased by 21.64 percentage points during the period from 1997 to 2003, surged by 2.58 percentage points during the subsequent six-year period ranging from 2003 to 2009 before further increasing by 5.57 percentage points during the period between 2009 and 2015 (from 119.27% of GDP in 2009 to 124.84% of GDP in 2015). The period between 2015 and 2020 saw Thailand's trade openness massively plummeting by 26.85 percentage points, from 124.84% of GDP in 2015 to 97.99% of GDP in 2020.
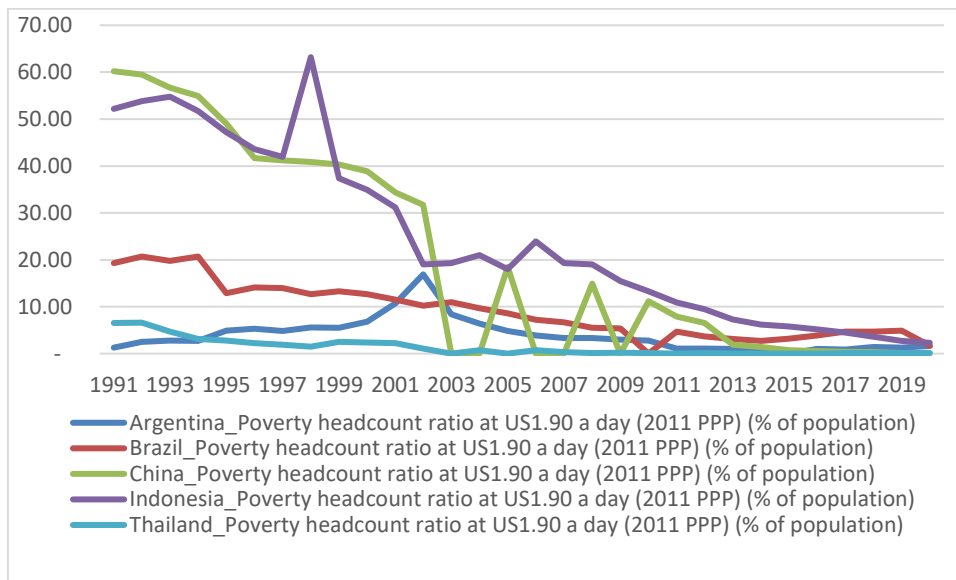

Figure 2. Poverty Headcount Ratio at US1.90 a Day (2011 PPP) (% of Population) Trends for Selected Upper Middle-Income Countries

Figure 2 shows that Argentina's poverty headcount increased from 1.30% of population in 1991 to 4.80% of population in 1997, went up by 3.60 percentage points during the subsequent six-year period before declining by 5.40 percentage points during the period ranging from 2003 to 2009. A 2.05 percentage points decline in Argentina's poverty headcount was observed during the six-year period ranging from 2009 to 2015 whilst the five-year period from 2015 to 2020 saw Argentina's poverty headcount increasing from 0.95% of population to 1.6% of population.

Brazil's poverty headcount consistently decreased during the 20-year period ranging from 1991 to 2020. It decreased by (1) 5.3 percentage points (from 19.3% of population in 1991 to 14% of population in 1997), (2) 3 percentage points (14% of population in 1997 to 11% of population in 2003), (3) 5.6 percentage points (11% of population in 2003 to 5.4% of population in 2009), (4) 2.2 percentage points (5.4% of population in 2009 to 3.2% of population in 2015) and (5) 1.5 percentage points (from 3.2% of population in 2015 to 1.7% of population in 2020).

China, Indonesia and Thailand's poverty trends resemble that of Brazil as they show a consistent downward trend from 1991 to 2020. China's poverty headcount ratio went down from 60.2% of population in 1991 to 41.2% of population in 1997, declined by 11 percentage points during the subsequent six-year period (1997 to 2003) before further decreasing by 16.7 percentage points during the six-year period ranging from 2003 to 2009. The period between 2009 and 2015 saw China's poverty headcount ratio going down from 13.5% of population in 2009 to 0.7% of population in 2015 before experiencing a further decline of 0.6 percentage points during the period ranging from 2015 to 2020 (from 0.7% of population in 2015 to 0.1% of population in 2020).

Indonesia's poverty headcount ratio went down by 10.3 percentage points during the period between 1991 and 1997, experienced a further decline of 22.6 percentage points during the subsequent six-year period (between 1997 to 2003) before further plummeting from 19.3% of population in 2003 to 15.5% of population in 2009. The period between 2009 and 2015 saw Indonesia's poverty headcount ratio plummeting by 9.7 percentage points before further experiencing a decline of 3.5 percentage points, from 5.8% of population to 2.3% of population.

Thailand's poverty headcount ratio went down from 6.5% of population in 1991 to 1.9% of population in 1997, declined by 1 percentage points during the subsequent six-year period before plummeting by 0.70 percentage points during the period ranging from 2003 to 2009. The poverty headcount ratio for Thailand went down from 0.2% of population in 2009 to 0.1% of population in 2015. The period between 2015 and 2020 shows that Thailand's poverty headcount ratio remained unmoved at 0.1% of population.

6. Research Methodology

This study used panel data (1991-2020) to examine the influence of trade openness on poverty in upper middle-income countries. The latter includes Argentina, Brazil, China, Indonesia and Thailand. World Bank Indicators is the international database from which data was extracted.

The general model specification as presentation in equation 1 was informed by existing empirical research work done by Bayar and Sezgin (2017), Togo (2020), Ghazanfar et al (2021), Chaudhry and Imran (2013), Mabugu and Chitiga (2007), Kelbore (2015), Mbah et al (2022), Maku et al (2021), Fang and Qamruzzaman (2021) and Gnangnon (2020).

POVERTY = f (TRADE, FIN, HCAP, GROWTH, INFR, FDI, REMIT, SAV) (1)

POVERTY, TRADE, FIN, HCAP, GROWTH, INFR, FDI, REMIT and SAV respectively represents poverty, trade openness (trade liberalization), financial development, human capital development, economic growth, infrastructural development, foreign direct investment, personal remittances and gross domestic savings. The poverty headcount ratio at US1.90 a day (2011 PPP) (% of population) is the measure of poverty used in this study. Total trade (% of GDP) was used as a proxy of trade openness. The measures for the control variables (FIN, GROWTH, FDI, SAV, HCAP, INFR, REMIT) are mentioned in Section 4 (control variables of the poverty function). The selection of the measures of the explanatory variables relied on earlier similar research work done by Abate (2014), Roshan and Hashemi (2016), Adegboyo et al (2021), Agusalim (2017), Pradhan and Mahesh (2014), Sattar and Khan (2021), Goff and Singh (2014) and Adha et al (2018).

Equation 2 and 3 is the econometric estimation format of equation 1 (general model specification). The difference between equation 2 and 3 is that the former includes the complementarity variable between (trade openness x financial development) whilst the latter's complementarity variable has a product of trade openness and human capital development. The introduction of the complementarity variable in both equations 2 and 3 follows an argument by Roshan and Hashemi (2016) which says that trade openness reduces poverty levels through channels such as financial development, economic growth and human capital development. It also resonates with Balsalobre-Lorente et al (2023; 5) whose study used a similar economic model to examine whether renewable energy consumption was a channel through which globalization influenced carbon emissions in Central and Eastern European countries.

$$POVERTY_{it} = \beta_0 + \beta_1 TRADE_{it} + \beta_2 FIN_{it} + \beta_3 (TRADE_{it} \cdot FIN_{it}) + \beta_4 HCAP$$
$$+ \beta_5 GROWTH_{it} + \beta_6 INFR_{it} + \beta_7 FDI_{it} + \beta_8 REMIT_{it} + \beta_9 SAV_{it} + \mu + \varepsilon \qquad (2)$$

$$\text{POVERTY}_{it} = \beta_0 + \beta_1 \text{TRADE}_{it} + \beta_2 \text{HCAP}_{it} + \beta_3 \, (\text{TRADE}_{it} \cdot \text{HCAP}_{it}) + \beta_4 \, \text{FIN}$$
$$+ \beta_5 \text{GROWTH}_{it} + \beta_6 \text{INFR}_{it} + \beta_7 \text{FDI}_{it} + \beta_8 \text{REMIT}_{it} + \beta_9 \text{SAV}_{it} + \mu + \varepsilon \qquad (3)$$

Consistent with Nuta and Nuta (2020) whose study used panel data analysis for its ability to investigate economic and financial related issues for a group of countries combined, equations 2 and 3 were estimated using panel data analysis approaches (fixed effects, fully modified ordinary least squares, pooled ordinary least squares). If the co-efficient β_3 is significantly negative, it means that the complementarity variable reduced poverty in the selected emerging markets studied.

7. Final Data Analysis

The data which used for analysis is the one in natural logarithms format, consistent with Aye and Edoja (2017) whose study noted the benefits of such a strategy. These include its ability to address the effects of multi-collinearity, outliers and abnormality in the data set. Phillip Perron Fisher Chi Square tests, Im, Pesaran and Shin, ADF Fisher Chi Square and Levin, Lin and Chu respectively are shown as PP, IPS, ADF and LLC (see Table 3). Consistent with Abban et al (2022; 4-5) and Nuta et al (2023: 331-332), the data analysis procedure begins with descriptive statistical analysis, unit root tests, co-integration tests and finally main data analysis.

Table 3. Panel Stationarity Tests (Individual Intercept)

Level				
	LLC	**IPS**	**ADF**	**PP**
LPGAP	3.20	4.43	2.04	2.09
LOPEN	-0.46	0.05	8.15	10.09
LFIN	-0.95	-1.05	12.07	20.54
LHCAP	-5.88***	-4.48***	38.78***	52.60***
LGROWTH	-1.39*	0.39	6.53	5.23
LINFR	-7.15***	-4.90***	44.07***	34.12***
LFDI	0.48	-0.77	12.98	25.72***
LREMIT	-2.72***	-2.68***	23.36***	23.78***
LSAV	-0.56	-1.06	12.58	12.88
First difference				
LPGAP	-1.39*	-3.67***	32.56***	74.60***
LOPEN	-3.02***	-5.27***	46.58***	88.59***
LFIN	-5.44***	-10.33***	96.93***	126.86***
LHCAP	-10.82***	-11.49***	109.06***	127.25***
LGROWTH	-3.35***	-4.16***	36.05***	53.90***
LINFR	-1.39*	-1.59*	15.96*	21.69**
LFDI	-2.99***	-6.72***	61.77***	100.01***
LREMIT	-1.54*	-5.98***	53.64***	116.77***
LSAV	-3.06***	-5.04***	45.45***	77.41***

***, ** and * stands for 1%, 5% and 10% significance levels, respectively.

Source: E-Views

Contrary to the level stage, the data for all the variables used were stable at first difference. This means that the dataset for all the variables was integrated of order 1, in line with Odhiambo (2010). The results paved room for panel co-integration tests to take place (see Table 4 for results).

Table 4. Johansen Fisher Panel Co-integration test

Hypothesised No. of CE(s)	Fisher Statistic (from trace test)	Probability	Fisher Statistic (from max-eigen test)	Probability
None	110.2	0.0000	472.1	0.0000
At most 1	594.9	0.0000	191.8	0.0000
At most 2	251.8	0.0000	158.4	0.0000
At most 3	197.4	0.0000	84.79	0.0000
At most 4	140.0	0.0000	66.31	0.0000
At most 5	89.73	0.0000	47.59	0.0000
At most 6	51.63	0.0000	30.87	0.0006
At most 7	31.79	0.0004	26.94	0.0027
At most 8	19.80	0.0312	19.80	0.0312

Source: E-Views

Looking at Table 4 results, at most 8 co-integrating relationships between and among the variables used were observed (using both trace and max-eigen tests). Such results which shows the existence of a long run relationship allowed the final and main data analysis to occur, consistent with the econometric procedure followed by Nuta et al (2023, p. 332).

Table 4, 5 and 6 presents result for main data analysis. In each Table of results, model 1 excludes the complementarity variable. Model 2 includes the complementarity variable between trade openness and financial development. The complementarity variable in model 3 is between trade openness and human capital development.

Table 5. Trade Openness and Poverty in Upper Middle-Income Countries –Fixed Effects

	Poverty		
	(1)	(2)	(3)
TRADE	-0.15	-0.02***	-0.16*
FIN	-0.09	-0.21***	-0.08
HCD	-0.34	-0.02	-0.14*
GROWTH	-1.51***	-1.43***	-1.42***
INFR	-0.05	-0.08*	-0.07
FDI	0.14***	0.14***	0.13**
REMIT	-0.12	-0.08	-0.15

SAV	1.34**	0.73	0.14**
TRADE*FIN		-0.56***	
TRADE*HCD			-0.88**
Number of countries	5	5	5
Adjusted R-squared	0.87	0.88	0.87
F-statistic	84.57	83.80	80.15
Prob(F-statistic)	0.00	0.00	0.00

***/**/* indicate 1%, 5% and 10% significance levels respectively
Source: E-Views

Under the fixed effects (Table 5), model 1 shows that trade openness had a non-significant negative influence on poverty whilst models 2 and 3 indicates a significant negative relationship running from trade openness towards poverty. These results mean that trade openness reduced poverty across all the three models in Table 5, consistent with Pradhan and Mahesh (2014) whose research work noted that the easy access to international commodity and financial markets makes it faster for the domestic firms to expand, job creation, wealth and reduce poverty.

Whilst models 1 and 3 produced results which show that financial development had an insignificant negative effect on poverty, model 2 indicates that the negative impact of financial development on poverty was significant. These results resonate with Rajan and Zingales (1998) whose study argued that access to small loans helps the people to kick start their small projects in a bid to eradicate poverty.

Human capital development's influence on poverty was found to be insignificantly negative under models 1 and 2 whilst the influence of human capital development on poverty was negative and significant under model 3. Such results mean that human capital development generally reduced poverty levels in upper middle-income countries, consistent with Chaudhry and Rehman (2009) and Afzal et al (2010) whose study argued that skilled and educated people are more likely to easily secure employment that is better paying.

Table 6. Trade Openness and Poverty in Upper Middle-Income Countries–Fully Modified Ordinary Least Squares (FMOLS)

	Poverty		
	(1)	(2)	(3)
TRADE	-0.43	-0.20*	-0.32*
FIN	-0.05	-0.34*	-0.02
HCD	-0.42	-0.51	-0.17
GROWTH	-1.56***	-1.48***	-1.45***
INFR	-0.05	-0.08	-0.07
FDI	0.18**	0.17**	0.17**
REMIT	-0.16	-0.10	-0.21
SAV	0.24**	0.96	0.25*

TRADE*FIN		-0.59**	
TRADE*HCD			-0.32*
Number of countries	5	5	5
Adjusted R-squared	0.87	0.88	0.87
Prob(F-statistic)	0.00	0.00	0.00

***/**/* indicate 1%, 5% and 10% significance levels respectively
Source: E-Views

Under the fully modified ordinary least squares (FMOLS) results in Table 6, trade openness's significant negative impact on poverty was observed under models 2 and 3. Model 1 indicates that trade openness had a non-significant negative impact on poverty. Just like in Table 5, these results also indicate that trade openness had a deleterious influence on poverty in upper middle-income countries.

Whilst model 2 indicates a significant negative impact of financial development on poverty, models 1 and 3 show that the negative effect of financial development on poverty was non-significant. The results are consistent with those observed in Table 5, indicating that poverty was generally reduced by financial development in upper middle-income countries. Across all the three models in Table 6, a non-significant negative relationship running from human capital development towards poverty was noted.

Table 7. Trade Openness and Poverty in Upper Middle-Income Countries –Pooled Ordinary Least Squares (Pooled OLS)

	Poverty		
	(1)	(2)	(3)
TRADE	-0.99***	-0.78***	-0.24***
FIN	-0.13	-0.20***	-0.15
HCD	-0.2183***	-0.39***	-0.88***
GROWTH	-0.07	-1.37***	-0.91***
INFR	-0.20***	-0.02	-0.06
FDI	-0.10	0.07	-0.08
REMIT	-0.25*	-0.12	-0.27**
SAV	0.2189***	-0.42*	-0.13
TRADE*FIN		-0.39***	
TRADE*HCD			-0.38
Number of countries	5	5	5
Adjusted R-squared	0.78	0.83	0.67
Prob(F-statistic)	0.00	0.00	0.00

***/**/* indicate 1%, 5% and 10% significance levels respectively
Source: E-Views

In Table 7, the pooled OLS approach shows that trade openness had a significant negative influence on poverty across all the three models. The results indicate that

trade openness reduced poverty in upper middle-income countries, consistent with Pradhan and Mahesh (2014) argument. Model 1 and 3 under the pooled OLS methodology (Table 7) noted that poverty was non-significantly but negatively affected by financial development. Model 2 indicates that a significant negative impact of financial development on poverty occurred. The results are in line with Rajan and Zingales (1998)'s observations. Human capital development's influence on poverty was found to be negative and significant across all the three models, a result which resonates with Afzal et al (2010)'s view already enunciated in earlier sections.

Fixed effects, FMOLS and pooled OLS show that the complementarity between trade openness and financial development had a significant negative influence on poverty. FMOLS and fixed effects produced results which also indicates that poverty in upper middle-income countries was negatively but significantly affected by the complementarity between trade openness and human capital development. Pooled OLS indicates that the negative impact of a combination between trade openness and human capital development on poverty was observed to be non-significant. These results support the existing literature (Sattar and Khan. 2021; Goff and Singh. 2014; Roshan and Hashemi. 2016) which mentions that there are conditions that must be in place to enhance trade openness's poverty reduction influence.

8. Conclusion

This study examined whether trade openness is one of the determinants of poverty in upper middle-income countries using panel data (1991-2020) analysis methods such as fixed effects, pooled ordinary least squares (OLS) and fully modified ordinary least squares (FMOLS). Using the same data set and panel data analysis methodology, the study also explored whether the complementarity variables, (1) (trade openness and financial development) and (2) (trade openness and human capital development) were also the determinants of poverty in upper middle-income countries. The study was necessitated by the existence of mixed results, divergent views and gaps in the literature on the determinants of poverty and on the trade openness's influence on poverty. Models 2 and 3 consistently produced results which show that trade openness reduced poverty in upper middle-income countries. The complementarity variables (1) trade openness and financial development and (2) trade openness and human capital development were also found to have had a poverty reduction influence in upper middle-income countries. The study therefore urges the authorities in selected upper middle-income countries to craft and implement policies which further opens up trade with other countries and which also enhances both human capital and financial development in order to alleviate poverty. A future study on the threshold levels of trade openness, human capital and financial

development that significantly reduces poverty will add value to the existing literature.

References

Abate, A.A. (2014). The impact of trade openness on poverty via agricultural total factor productivity in Ethiopia: A sequential dynamic computable general equilibrium micro simulation analysis. *Ethiopian Journal of Economics,* xxx111 (1), pp. 1-30.

Abban, O.J. Hongxing, Y. Nuta, A.C. Dankyi, A.B. Ofori, C. and Cobbinah, J. (2022). Renewable energy, economic growth and CO2 emissions contained co-movement in African oil producing countries: A wavelet-based analysis. *Energy Strategy Reviews,* 44, 2022, p. 100977. https://doi.org/10.1016/j.esr.2022.100977.

Adegboyo, O.S.; Efuntade, O.O.; Olugbamiye, D.O. & Efuntade, A.O. (2021). Trade openness and poverty reduction in Nigeria, *EuroEconomica,* 40 (2), pp. 165-171.

Adeyemi, S.L.; Ijaiya, G.T. & Raheem, U.A. (2009). Determinants of poverty in Sub-Saharan Africa. *African Research Review*, 3 (2), pp. 162-177.

Adha, M.A.; Nahar, F.H. & Azizurrohman, M. (2018). The impacts of trade liberalization on poverty reduction in Indonesia. *Jurnal Ekonomi and Studi Pembangunam,* 19 (2), pp. 178-185.

Afzal, M.; Malik, M.E.; Begum, I.; Sarwar, K. & Fatima, H. (2010). Relationship among education, poverty and economic growth in Pakistan: An Econometric analysis. *Journal of Elementary Education*, 22(1), pp. 23-45.

Agusalim, L. (2017). The dynamic impact of trade openness on poverty: An empirical study of Indonesia's economy, *International Journal of Economics and Financial Issues*, 7 (1), pp. 566-574.

Akerele, D.; Momoh, S.; Adewuyi, S.A./ Phillip, S.A. & Ashaolu, O.F. (2012). *Socio-economic determinants of poverty among urban households in South-West Nigeria*, 39 (3), pp. 168-181.

Anyanwu, J.C. & Erhijakpor, A.E.O. (2010). Do international remittances affect poverty in Africa? *African Development Review*, 22(1), pp. 51-91.

Aye, G.C. & Edoja, P.E. (2017). Effect of economic growth on C02 emission in developing countries: Evidence from a dynamic panel threshold model. *Cogent Economics and Finance, 5* (1), pp. 1-22.

Azizah, P.A. (2018). Determinants of poverty in East Kalimantan Province, Indonesia. *International Journal of Scientific and Technology Research, 7* (5), pp. 112-115.

Balsalobre-Lorente, D.; Shahbaz, M.; Murshed, M. & Nuta, F. M. (2023. Environmental impact of globalization: The case of Central and Eastern European emerging economies. *Journal of Environmental Management*, 341 (1), p. 118018 https://doi.org/10.1016/j.jenvman.2023.118018.

Bannister, G. J. & Thugge, K. (2001). International trade and poverty alleviation. *Finance and Development – A quarterly magazine of the International Monetary Fund, 38* (4), pp. 1-8.

Bayar, Y. & Sezgin, H.F. (2017). Trade openness, inequality and poverty in Latin American countries. *Ekonomika, 96* (1), pp. 47-57.

Biyase, M. & Zwane, T.T. (2018). An empirical analysis of the determinants of poverty and household welfare in South Africa. *The Journal of Developing Areas, 52* (1), pp. 116-130.

Borko, Z. P. (2017). Determinants of poverty in rural households (The case of Damot Gale District in Wolaita Zone) – A household level analysis. *International Journal of African and Asian Studies,* 29, pp. 68-75.

Boukhatem, J. (2016). Assessing the direct effect of financial development on poverty reduction in a panel of low and middle-income countries. *Research in International Business and Finance*, 37(May), pp. 214-230.

Cattaneo, C. (2005). International migration and poverty: A cross country analysis. *World Economy,* 32 (8), pp. 1180-1202.

Chaudhry, I.S. & Imran, F. (2013). Does trade liberalization reduce poverty and inequality? Empirical evidence from Pakistan. *Pakistan Journal of Commerce and Social Sciences*, 7 (3), pp. 569-587.

Chaudhry, I.S. & Rahman, S. (2009). The impact of gender inequality in education on rural poverty in Pakistan: An empirical analysis, *European Journal of Economics*, 15, pp. 174-188.

Chitsika, P. (2015). Poverty determinants in Chivi district, Masvingo Province, Zimbabwe: An application of econometric modelling techniques on household data. *Unpublished master's thesis*. University of Zimbabwe, Harare.

Cho, S. & Kim, T. (2017). Determinants of poverty status in Rwanda. *African Development Review,* 29 (2), pp. 337-349.

Fang, L. & Qamruzzaman, M. (2021). An asymmetric investigation of remittance and trade openness impact on inequality: Evidence from selected South Asian countries. *Frontiers in Psychology,* 12, pp. 1-17.

Figini, P. & Santarelli, E. (2006). Openness, economic reforms and poverty: Globalization in developing countries. *The Journal of Developing Areas,* 39 (2), pp. 129-151.

Geda, A.; Jong, N.; Kimenyi, M.S. & Mwabu, G. (2005). Determinants of poverty in Kenya. *University of Connecticut, Department of Economics Working Paper Series Number,* pp. 44.

Ghazanfar, U.; Lodhi, R.N.; Bandeali, M.S.M. & Khalil, A. (2021). An empirical relationship between trade liberalization and poverty: Comparative analysis of selected SAARC countries. *Globalization of Trade and its impact of economics,* 39 (2), pp. 13-42.

Gnangnon, S. K. (2020). Do poverty rates matter for trade openness in developing countries? *Journal of International Commerce, Economics and Policy,* 11 (3), pp. 13-19.

Goff, M.L. & Singh, R.J. (2014). Does trade reduce poverty? A view from Africa. *Journal of African Trade,* 1 (1), pp. 5-14.

Im, K.S.; Pesaran, M.H. & Shin, Y. (2003). Testing unit roots in heterogeneous panels. *Journal of Econometrics,* 115(1), pp. 53-74.

Jahan, S. & McCleery, R. (2005). *Making infrastructure work for the poor: Synthesis report of four country studies - Bangladesh, Senegal, Thailand and Zambia*. New York: UNDP.

Kelbore, Z.G. (2015). Trade openness, structural transformation and poverty reduction: Empirical evidence from Africa. *Munich Personal RePEc Archive Paper Number 65537.*

Khan, S.U.; Sheikh, M.R.; Dimen, L.; Batool, H.; Abbas, A. & Nuta, A. C. (2023). *Nexus between health poverty and climatic variability in Pakistan: A geospatial analysis Frontiers in Environmental Science,* 11, 1180556. https://doi.org/10.3390/su12041681.

Khatun, R. (2015). The impact of micro-level determinants of poverty in Bangladesh: A field study. *International* Jo*urnal of Research in Management and Business Studies,* 2 (2), pp. 9-13.

Kuznets, S. (1995). Economic growth and income inequality. *American Economic Review (March)*, pp. 1-28.

Levin, A.; Lin, C.F. & Chu, C.S.J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics,* 108(1), pp. 1-24.

Mabugu, R. & Chitiga, M. (2007). South Africa trade liberalization and poverty in a dynamic microsimulation CGE model. *University of Pretoria, Department of Economics Working Paper Series Number 18.*

Majeed, M. T. & Malik, M. N. (2015). Determinants of household poverty: Evidence from Pakistan. *The Pakistan Development Review,* 54 (4), pp. 701-718

Maku, O. E.; Ogede, J. S.; Adelowokan, O. A. & Oshinowo, B. O. (2021). Exploring the interaction of trade openness, income inequality and poverty in Nigeria. *Journal of Enterprise and Development,* 3 (2), pp. 113-130.

Mbah, S.A.; Agu, O.C.; Fasina, O.T. & Oshodi, A. F. (2022). Trade openness and poverty: An empirical study of Nigeria's economy. *African Journal of Business and Economic Research,* 17 (1), pp. 255-274.

Merid, A. & Bekele, D. (2019). Determinants of poverty in rural Ethiopia: Evidence from Tenta woreda, Amhara region. *Journal of Sustainable Rural Development,* 3 (1), pp. 3-14.

Misiunas, A. & Binkauskiene, G. (2007). Determinants of poverty in Lithuania. *Intellectual Economics,* 2007 (1), pp. 55-63.

Mukherjee, S. & Benson, T. (2003). The determinants of poverty in Malawi, 1998. *World Development,* 31 (2), pp. 339-353.

Nuta, A.C. & Nuta, F.M. (2020). Modelling the influences of economic, demographic and institutional factors on fiscal pressure using OLS, PCSE and FD-GMM approaches. *Sustainability,* 12, p. 1981.

Nuta, F.M.; Ali, S.; Abban, O.J.; Khan, I.; Irfan, M.; Nuta, A.C.; Dankyi, A.B. & Asghar, M. (2023). The relationship among urbanization, economic growth, renewable energy consumption and environmental degradation: A comparative view of European and Asian emerging economies. *Gondwana Research,* 1128, pp. 325-339.

Odhiambo, N.M. (2010). Is financial development a spur to poverty reduction? Kenya's experience. *Journal of Economic Studies,* 37 (3), pp. 343-353.

Olofin, O.; Adejumo, A. & Sanusi, A. (2015). Determinants of poverty levels in Nigeria. *Journal of Sustainable Development,* 8 (1), pp. 235-241.

Owuor, G.; Ngigi, M.; Ouma, A.S. & Birachi, E.A. (2007). Determinants of rural poverty levels in Africa: The case of Smallholder farmers in Kenya. *Journal of Applied Sciences,* 7, pp. 2539-2543.

Pradhan, B.K. & Mahesh, M. (2014). Impact of trade openness on poverty: A panel data analysis of a set of developing countries. *Economic Bulletin,* 34(4), pp. 2208-2219.

Qadir, U.; Kemal, M.A. & Mohsin, H.M. (2000). Impact of trade reforms on poverty. *The Pakistan Development Review,* 39 (4), pp. 1127-1137.

Rajan, R. & Zingales, L. (1998). Financial dependence and growth. *American Economic Review*, 88(2), pp. 560-586.

Rewilak, J. (2017). The role of financial development in poverty reduction. *Review of Development Finance,* 7 (2), pp. 169-176.

Romer, P. (1986). Increasing returns and long run economic growth. *Journal of Political Economy*, 94 (5), pp. 1002-1037.

Roshan, S.A. & Hashemi, Z. (2016). The impact of trade openness on poverty in Iran: Simultaneous equations system method. *Quarterly Journal of Applied Theories of Economics*, 3 (8), pp. 183-204.

Rupasingha, A. & Goetz, S.J. (2007). Social and political forces as determinants of poverty: A spatial analysis. *The Journal of Socio-Economics,* 36, pp. 650-671.

Sattar, R. & Khan, R.E.A. (2021). Troika of trade openness, poverty and income inequality: Empirical evidence from lower and middle-income countries. *Review of Economics and Development Studies,* 7 (2), pp. 243-256.

Sekhampu, T.J. (2017). Determinants of poverty in a South African township. *Journal of Social Sciences,* 34 (2), pp. 145-153.

Shahbaz, M.; Nuta, A.C.; Mishra, P. & Ayad, H. (2023). The impact of informality and institutional quality on environmental footprint: The case of emerging economies in a comparative approach. *Journal of Environmental Management,* 348 (15), p. 119325.

Spaho, S. (2014). Determinants of poverty in Albania. *Journal of Educational and Social Research,* 4 (2), pp. 157-163.

Steinert, J.I.; Zenker, J.; Filipiak, U.; Movsisyan, A.; Cluver, L.D. & Shenderovich, Y. (2017). Do saving promotion interventions help alleviate poverty in Sub-Saharan Africa? A systemic review and meta-analysis. *Courant Research Centre Discussion Paper Number 226.*

Sugiharti, L. & Primanthi, M. R. (2017). The determinants of poverty: Case of Indonesia. *Global Journals of Business and Social Science Review,* 5 (3), pp. 58-68.

Togo, A. (2020). Does trade liberalization reduce poverty in Mali? Evidence from ARDL Bounds Testing Approach. *International Journal of Economics and Finance,* 12 (9), pp. 11-22.

Usuka, K. (2019). An analysis of the determinants of poverty in India and South Africa. *Global Majority E-Journal,* 10 (2), pp. 100-115.

Winters, L.A.; McCulloch, N. & McKay, A. (2004). Trade liberalization and poverty: The evidence so far. *Journal of Economic Literature,* 42 (1), pp. 72-115.

World Bank (2001). *World Development Report 2000*. Oxford University Press, New York, NY.