

Aid for trade, government effectiveness and poverty in developing countries: a quantile regression analysis

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Abstract

Purpose – This study aims to assess the effect of Aid for Trade (AfT) inflows on poverty in 60 developing countries and whether this effect depends on the effectiveness of these recipient countries' governments in better allocating these inflows.

Design/methodology/approach – The analysis has applied the quantile regression (QR) approach on an unbalanced panel data set of 60 developing countries over the period 2009–2018.

Findings – The findings showed a positive and significant overall correlation between AfT and poverty. This favourable effect, however, only applies to the non-least developed countries (LDCs). However, under a more effective governance environment, the aggregate AfT inflows appeared to reduce poverty levels for the full sample of countries, particularly for the LDCs.

Originality/value – This study is considered the initial empirical investigation of the relationship between AfT and poverty using the QR approach, and whether this relationship depends on the government effectiveness of these nations. The QR approach enables determining if this effect is more significant in recipient nations with higher rates of poverty (LDCs) than in recipient nations with lower rates of poverty (non-LDCs).

Keywords Aid for trade, Poverty, Government effectiveness, Quantile regression approach, Developing countries

Paper type Research paper



1. Introduction

The world has made remarkable and unprecedented progress in reducing extreme poverty over the past quarter-century. In 2015, poverty fell to 10% of the global population from 36% in 1990 (World Bank, 2018). This progress was initially driven by the massive global economic growth and the rising wealth of many developing countries, particularly in the world's most populous regions of East Asia and the Pacific and South Asia, where China's economic rise has helped lift millions of people out of extreme poverty. This remarkable

progress has brought the World Bank's goals of elevating absolute poverty to lower than 3% of the world population by 2030 nearer to accomplishment. Despite these encouraging reports, the human cost of COVID-19 is immense, with hundreds of millions of people in the developing world falling back into poverty. The World Bank (2022) report on *Poverty and Shared Prosperity* stated that in 2020, the number of people living in extreme poverty increased to more than 70 million and the increase is considered to be the highest since 1990. Moreover, in 2030, it is estimated that 574 million people, or about 7% of the worldwide population, will continue to rely on less than US\$2.15 per day, mostly in Africa. Based on these significant increases in the number of poor people globally, reduction is still a primary concern for most developing nations' governments and international development partners, as poverty levels can stifle development and growth. For instance, the United Nations (UN) prioritises reducing severe poverty in all its forms and creating economic stability on a long-term basis in its Sustainable Development Goals (SDGs) agenda. Moreover, several policymakers in developing countries are now largely relying on Official Development Assistance (ODA) inflows as forms of capital formation to accelerate economic growth and alleviate poverty, particularly the Aid for Trade (AfT) programmes, which are considered to be one of the largest types of ODA grants that could perform a catalytic role in promoting the agenda of SDGs (United Nations, 2015), precisely, the SDG 1, which aims for no poverty, and the SDG 8 (decent work and economic growth) (OECD/WTO, 2019, p. 245). In doing this, AfT intends to boost the volume of ODA directed at trade-related programmes to maximise trade benefits and use it as a tool for poverty reduction.

According to the WTO (2006) Task Force:

AfT is allocated to help developing nations expand their products and services exports, incorporate into the global trading regime, and profit from trade freedom and greater market accessibility. Effective AfT will boost potential economic growth and reduce poverty in emerging countries, in addition to complementing multilateral trade policies and more fairly distributing the global advantages both within and among these countries (OECD/WTO, 2013, p. 146).

While there are many empirical studies on the effectiveness of the total ODA on poverty rates (to mention a few, Burnside and Dollar, 2000; Collier and Dollar, 2002; Alvi and Senbeta, 2012; Mahembe and Odhiambo, 2020), the empirical literature on the AfT effect on poverty is limited to two studies, namely, Durowah (2017) and Gnanon (2021), although one of the primary objectives of the AfT programme is to assist developing countries, notably, the least developed countries (LDCs), to use trade more effectively to enhance growth and reduce poverty (OECD/WTO, 2015, p. 25). The AfT-poverty linkage was first proposed by Martínez-Zarzoso *et al.* (2017), who stated the following: "A key focus of future research should be to explore the linkage among AfT inflows and a variety of social outcomes, including poverty rates".

Following this recommendation, Durowah (2017) conducted the first empirical analysis to examine the AfT-poverty linkage by applying fixed and random effects estimation techniques across different income groups of 91 recipient countries. In addition, Gnanon (2021) conducted the first generalised method of moments (GMM) analysis on panel data from 120 recipient countries. The GMM approach tends to assess how the mean of the dependent variable changes. Although these results might be useful for policymakers, it may be more interesting to use the quantile regression (QR) approach to determine whether the impact of AfT inflows on poverty varies between quantiles. The current study is considered to be the first empirical study to investigate the AfT-poverty linkage using the QR approach and whether this effect is dependent on the governance quality of these countries. Besides, this study includes the poverty gap index in addition to the poverty headcount index as dependent variables, whereas the previous two studies focused only on the poverty

headcount ratio. The QR technique enables determining whether this effect is more significant in recipient nations with higher rates of poverty or the LDCs than in recipient nations with lower rates of poverty (the non-LDCs). Thus, investigating the validity of the principal goal of the AfT inflows, which comprises “assisting developing nations, particularly least developed nations, to use trade more effectively to boost economic growth and decrease poverty” (OECD/WTO, 2013, p. 146). The rest of the paper is organised as follows. Section 2 discusses the poverty data in the AfT recipient countries and the critical role of AfT inflows in elevating this phenomenon. Section 3 presents the literature review. Section 4 describes the model and the econometric method. Section 5 discusses the empirical findings. Section 6 concludes with policy implications and future suggestions.

2. Background

2.1 Aid for trade recipient countries

All nations and regions qualified to receive ODA are represented on the Development Assistance Committee (DAC) List of ODA Recipients, with the exclusion of G8 members, EU members, and nations having a fixed date for entrance into the EU. These ODA-eligible beneficiaries, are low- and middle-income nations based on their Gross National Income per capita as reported by the World Bank The complete DAC List of ODA recipients by income group and Region can be found at: www.oecd.org/dac/stats/daclist.htm

Table 1 demonstrates a brief review of the top 20 recipient countries of AfT disbursements over the 2006–2020 time period.

2.2 Poverty in aid for trade recipient countries

In 1990, 36% of the global population lived in absolute poverty (US\$1.90 per day). By 2015, the percentage had dropped to 10%. Putting it in numbers, 736 million people lived under this line in 2015, down from approximately 2 billion in 1990 (World Bank, 2018). Most of the advancement achieved in the past 25 years has occurred in East Asia and the Pacific, from a poverty rate of 62% in 1990 to less than 3% in 2015, thanks to the Chinese economic ascent, which aided millions of people in escaping absolute poverty. In addition, South Asia has made significant progress against absolute poverty in recent years, contributing to further reductions in the global rate. In 2015, the number of poor in South Asia fell to 216 million, down from half a billion in 1990 (World Bank, 2018). Furthermore, many other nations with high poverty rates, such as Bangladesh, Indonesia, Nigeria, India and Kenya, have expanded their class from low-income to middle-income between 1990 and 2015. With this growth, the bulk of the world’s poor nations have relocated from low-income to middle-income countries, accounting for approximately two-thirds of the global poor. Nevertheless, as more economies transition from low-income to middle-income levels, the population ratio shifts as well. In 2015, 50 million people resided in upper-middle-income nations, compared to 640 million in low-income nations and 400 million in lower-middle-income nations (World Bank, 2018).

Digging a little deeper into the countries with the poorest populations, the heavily populated countries in South Asia, namely, Bangladesh and India, and in Sub-Saharan Africa (SSA), namely, Ethiopia, the Democratic Republic of Congo and Nigeria, are the five countries with the highest number of extremely poor around the world. India is considered to be the poorest country in the world; it is home to four out of every five absolutely poor in South Asia. With a 13.4% poverty rate, India’s 1.3 billion population led to a substantial number of absolutely poor. Thus, India’s poverty alleviation initiatives must remain to fulfil the world poverty objective. (World Bank, 2018). According to this facts, from 2015 to 2017, the world poverty ratio declined by less than 0.5% points annually, with 9.2% of the world’s

Table 1. Top 20 aid for trade recipient countries in 2020

	Region	Income group	2002–2005 avg.	2006–2008 avg.	2009–2011 avg.	2012–2014 avg.	2015–2017 avg.	2018	2019	2020
India	Asia	LMICs	465.9	1 224.5	1 927.6	1 994.0	3 448.9	3 568.8	3 867.6	2 747.7
Bangladesh	Asia	LDCs	266.3	376.8	396.2	900.4	1 400.0	2 166.1	1 993.4	2 491.9
Egypt	Africa	LMICs	334.6	590.8	710.9	1 423.9	1 103.2	1 949.0	1 752.1	1 795.3
Ethiopia	Africa	LDCs	190.9	507.5	722.7	726.4	920.6	1 711.1	1 360.8	1 597.2
Kenya	Africa	LMICs	76.2	286.7	410.3	964.2	962.4	942.2	1 487.8	1 308.3
Vietnam	Asia	LMICs	406.9	1 066.6	1 581.6	2 610.1	2 209.6	1 368.0	1 094.1	1 248.7
Pakistan	Asia	LMICs	204.1	358.6	448.9	1 140.8	1 309.8	641.0	1 512.8	1 205.4
Morocco	Africa	LMICs	102.6	425.2	762.2	1 247.7	1 640.0	771.8	704.2	1 098.0
Myanmar	Asia	LDCs	4.3	16.4	47.8	183.5	468.4	695.0	858.7	1 032.9
Indonesia	Asia	LMICs	163.8	781.7	807.8	585.6	920.5	1 465.3	727.2	850.4
Iraq	Asia	LMICs	1 278.7	2 111.1	452.4	475.6	296.6	188.1	220.4	766.1
Honduras	America	LMICs	31.3	78.0	188.7	239.1	159.7	357.0	166.1	759.4
Afghanistan	Asia	LDCs	418.6	1 109.9	1 943.4	1 238.5	879.2	722.9	781.5	750.3
Uzbekistan	Asia	LMICs	18.5	53.6	74.1	137.7	367.4	721.6	720.0	695.2
Türkiye	Europe	UMICs	52.7	375.5	1 274.4	2 686.8	2 598.6	1 428.6	617.3	681.0
Brazil	America	UMICs	24.6	77.7	242.8	507.3	509.4	293.4	257.3	621.7
Philippines	Asia	LMICs	112.6	487.5	388.2	230.6	351.0	468.2	1 034.9	608.2
Tunisia	Africa	LMICs	48.6	197.7	377.3	534.3	577.3	660.1	759.1	562.1
Senegal	Africa	LDCs	89.7	219.7	250.9	354.2	384.7	333.5	807.4	553.4
Ghana	Africa	LMICs	153.0	335.8	558.7	551.3	465.6	452.8	403.8	509.0
Sub-total			4 443.7	10 681.4	13 567.0	18 731.9	20 973.1	20 904.2	21 126.4	21 882.1
Total aid for trade			9 231.3	23 018.0	32 055.2	38 968.2	43 918.5	46 654.2	47 165.5	48 731.7
Top 20 share in total AFT			48.1%	46.4%	42.3%	48.1%	47.8%	44.8%	44.8%	44.9%

Note(s): USD million (2020 constant)**Source(s):** OECD/WTO (2022, p. 196)

population living in extreme poverty. One factor contributing to this slowdown is SSA's slower rate of poverty reduction compared to other areas (World Bank, 2020). There has been no decrease in the number of poor people in SSA, although poverty has decreased in many other areas lately, most notably in East Asia, the Pacific and South Asia. The number of poor people in SSA increased from 284 million in 1990 to 431 million in 2017 (Table 2). Similarly, between 2015 and 2018, the rate of extreme poverty increased throughout the Middle East and North Africa area from 2.3% in 2013 to 3.8% in 2015 and nearly doubled to 7.2% in 2018. Finally, for the sixth consecutive year, the extreme poverty rate in Latin America and the Caribbean has remained constant at around 4% (World Bank, 2020).

2.3 Aid for trade inflows and poverty: theoretical foundation

Poverty eradication has long been a top priority for most developing countries' governments and international development agencies because high levels of poverty can hinder growth and development. The UN SDGs 2030 Agenda, for instance, prioritises ending extreme poverty and promoting shared prosperity as the first goal (SDG 1). The Aft initiative could perform a catalytic role in promoting these SDGs in the 2030 Agenda (United Nations, 2015), including SDG 1, which aims for no poverty, and SDG 8 (decent work and economic growth) (OECD/WTO, 2019, p. 245). Aft is theoretically believed to reduce poverty rates in the recipient countries through its various categories (Aft for economic infrastructure, Aft for productive capacity-building and Aft for trade and policy regulations) and impact on trade-related outcomes (Alonso, 2016). For example, Aft for economic infrastructure promotes the development of hard and soft infrastructure to reduce trade costs (by the strengthening of manufacturing and exporting) and may hence help beneficiary nations realise their targeted export strategy over the long run. In such a case, this subcategory could be exporting expertise and Aft inflows would be followed by a concentration or a broadening of exports (Gnangnon, 2019). In addition, Aft for productive capacity building might improve a nation's trade by enhancing the performance of its current export goods or assist the nation in diversifying its future export goods by concentrating on specific industries (Gnangnon, 2018). Reducing trade restrictions is the aim of Aft's trade policy and regulation category (Cali and te Velde, 2011). This category could be linked to a broadening or specialisation of exports or an improvement in the quality of these export industries. It would then assist the beneficiary nation's officials in creating greater trade laws that correspond with their export growth.

Trade can encourage growth, which is essential for reducing poverty. Whether this growth leads to the creation of jobs and a persistent reduction in poverty depends on governmental policies, socioeconomic circumstances and the external environment. The links between

Table 2. Number of poor at the US\$1.90-a-day poverty line, by region, 1990–2017

Region	1990	1996	2002	2008	2011	2015	2017	2018
East Asia and Pacific	976.9	702.1	538.4	285.9	159.7	42.2	29.3	24.5
Europe and Central Asia	14.4	33.0	26.7	12.9	9.7	7.3	6.5	5.6
Latin America and the Caribbean	66.3	67.6	64.4	39.9	33.7	23.6	24.4	24.2
Middle East and North Africa	15.0	16.6	10.0	9.0	8.0	13.8	24.0	28.0
South Asia	551.9	536.0	574.0	486.6	347.9	–	–	–
Sub-Saharan Africa	283.8	358.4	395.1	403.4	404.2	416.4	430.8	433.4
Rest of the world	4.1	5.2	5.1	5.5	6.0	7.1	6.5	6.5

Source(s): World Bank (2020)

trade and poverty are generally indirect and depend on how various trade policy mechanisms affect the supply of various commodities and services. Trade policy could affect the well-being of households by influencing the pricing of the commodities and services that household members buy and produce, either directly, via agricultural commodities (food is frequently the primary item of the household expenditure of poor people), or indirectly, via working in a particular industry (the majority of their revenues come from wages and rural industries) (UNCTAD, 2016). There exist two other channels, despite the ones mentioned above. The first channel is impacting businesses that operate in the nation to increase the domestic price of imports as a result of trade policy. For instance, if tariffs force up the cost of essential supplies, a firm's profitability, salaries or employment will decline. In the case of sales on the domestic market, the trade policy could generate the reverse impact if it drives up the cost of the business's product. The second channel is through government interventions. At the frontier, import tariffs or export taxes will bring in money to transfer, delivering funds to households, either directly through cash transfer programmes or indirectly through public services like health and education (UNCTAD, 2016).

Empirical research on the linkages between trade and poverty is still ambiguous and a controversial subject. A large number of empirical studies (for instance, Dollar and Kraay, 2004; Le Goff and Singh, 2014). Perera *et al.* (2014) claimed that the increase in the volume of trade could indeed result in a decline in poverty levels. Le Goff and Singh (2014) studied whether the effect of openness on poverty in 30 African countries varies with some country characteristics over the period 1981–2010. Their results show that trade helps to lessen poverty and redirect resources from less productive to more productive sectors. However, this result is only true for countries with good institutions, high levels of education and strong financial sectors. On the other hand, it might cause poverty rates to rise, as many other studies have shown (for instance, Naranpanawa *et al.*, 2011; Jeanneney and Kpodar, 2011; Beck, Demirgüç-Kunt and Levine, 2007). According to Naranpanawa *et al.* (2011), trade reforms may result in unequal gains for various household categories in Sri Lanka by increasing the wealth disparity between the wealthy and the poor. Singh and Huang (2015) further illustrated how trade widens the poverty gap and causes poverty.

3. Literature review

Due to the limitation of empirical studies regarding the direct impact of AfT inflows on poverty, the proof of effect of AfT inflows on poverty can be explored through the impact of overall ODA on poverty, focusing on both monetary and non-monetary indicators of poverty. Furthermore, this section surveys the two AfT-poverty empirical studies by Durowah (2017) and Gnangnon (2021).

3.1 *Impact of overall Official Development Assistance on poverty*

3.1.1 *On non-monetary indicators.* Due to the lack of scarcity of internationally comparable poverty data, several previous studies provided empirical examinations on the effectiveness of foreign aid using education and health indexes for poverty, such as illiteracy and infant mortality ratios. For instance, Arndt *et al.* (2015) evaluated the influence of aid on growth and social welfare parameters (poverty and infant mortality), as well as other parameters (including health, education, consumption, agriculture and investment). The authors discovered that foreign aid has aided economic growth by improving human capital, notably education and health and empowering physical capital accumulation. In contrast, Boone (1996) reported that aid is insignificantly related to life expectancy, infant mortality and elementary school enrolment ratios in 97 developing nations, arguing that aid ultimately benefits the political elite rather than the poor. Following this work, Easterly (2003) also

found no significant effect of foreign aid on health outcomes. In addition, [Masud and Yontcheva \(2005\)](#) used panel data from 58 recipient countries covering the period from 1990 to 2001 to investigate the impact of aid on infant mortality and illiteracy rates. The authors found that non-governmental organisations help reduce infant mortality, but there was no proof that bilateral aid reduces infant mortality or levels of illiteracy. Similarly, empirical analysis of the impact of health aid on overall health factors comes to conflicting conclusions. Despite this, numerous studies indicated that aid to the health sector would significantly enhance overall health outcomes (for instance, [Feeny and Ouattara, 2013](#); [Afridi and Ventelou, 2013](#); [Mishra and Newhouse, 2009](#); [Taylor et al., 2013](#); [Yogo and Mallaye, 2015](#); [Gyimah-Brempong, 2015](#)). Others concluded that health-care aid has no discernible impact on maternal mortality, infant mortality and life expectancy ([Wilson, 2011](#); [Kizhakethalackal et al., 2013](#); [Mukherjee and Kizhakethalackal, 2013](#); [Williamson, 2008](#)). Others showed that the effectiveness of health aid is substantially determined by the policy regime and governance quality ([Farang et al., 2013](#); [Fielding, 2011](#)).

In the context of the educational aid influence on outcomes like school enrolment, graduation rate and years of schooling, [Michaelowa and Weber \(2006\)](#) concluded that a 1% increase in educational aid resulted in a 2.5-point improvement in the primary graduation rate of 129 recipient countries. Likewise, [d'Aiglepierre and Wagner \(2013\)](#) discovered that primary education aid had a considerable favourable impact on school attendance rates but a negative impact on the repetition rate. [Dreher et al. \(2008\)](#) analysed the influence of aid on a selection of low- and middle-income nations from 1970 to 2004. The GMM estimation suggested that a 1% improvement in educational aid resulted in a 2.5–5% rise in net primary enrolment. Moreover, [Christensen et al. \(2011\)](#) investigation suggested that bilateral aid is positively linked to greater school enrolments compared to multilateral aid. Nevertheless, this effect is strongly conditioned by the recipient's ability to control corruption. [Birchler and Michaelowa's \(2016\)](#) findings implied that aid has been more relevant when it comes to improving primary education quantity compared to education quality.

3.1.2 On monetary indicators. The monetary indicators of poverty encompass the poverty rate, the poverty gap and the squared poverty gap. [Arvin and Barillas \(2002\)](#) used Granger causality to address the causality between aid provided by donors and the rate of poverty encountered by 118 recipient countries over the 1975–1998 period. The results differed widely across the geographic and income features of developing nations. [Iyoha \(2004\)](#) found that massive aid disbursements to Africa have had a small positive impact on enhancing growth and alleviating poverty. [Nakamura and McPherson's \(2005\)](#) showed that aid had no significant influence on poverty elevation in SSA between 1990 and 2001, whereas real per capita income had a robust, significant effect. [Chong et al. \(2009\)](#) used the GMM estimation method to evaluate the impact of foreign aid on poverty and income inequality in 116 recipient countries from 1971 to 2002. The results indicated that foreign aid appears to be statistically insignificant in reducing inequality and poverty. Foreign aid is essential in reducing inequality and poverty rates when the quality of institutions is considered. In addition, [Alvi and Senbeta \(2012\)](#) investigated the impact of foreign aid on poverty in 79 developing nations from 1981 to 2004. The system GMM estimator suggested that aggregate aid has a considerable poverty-reducing impact. The analysis also demonstrated that although multilateral aid and grants help people get out of poverty, bilateral aid and loans do not. In a similar study, [Mahembe and Odhiambo \(2020\)](#) applied the system GMM method to evaluate whether foreign aid is efficient in eliminating extreme poverty. The empirical analysis showed that foreign aid is statistically significant in poverty reduction. However, the decomposition of aid by type and source, aggregate aid, bilateral aid and grants are more essential to decreasing poverty. [Kaya et al. \(2013\)](#) explored the

effectiveness of agricultural aid on poverty reduction in 46 recipient nations from 1980 to 2003. The fixed effects (FE) method revealed that a 1% growth in agricultural aid decreases the headcount poverty ratio in recipient countries by 0.2% point.

3.2 Impact of aid for trade on poverty

Durowah (2017) used the fixed and random effects estimating methodologies across various income categories of 91 receiving nations to assess the interaction impact of Foreign Direct Investment, AfT inflows and its three primary components, and whether this effect relies on the institutional performance of the recipient nations. According to the estimation results, total AfT, along with AfT for economic infrastructure and trade policy and regulations, significantly contributes to the alleviation of poverty, especially in LDCs. The results also revealed that the receiving countries' political climate influences their effectiveness. The poverty headcount ratio in the recipient nations was negatively correlated with the same categories. These results suggest that donors may think about focusing their money more on AfT for trade policy and regulations as well as for economic infrastructure. In a more recent study, Gnanngnon (2021) added to the discussion on this issue by examining the impact of AfT flows on poverty in 100 recipient countries from 2002 to 2017. The analysis specifically examines whether this effect is mediated by countries' levels of export product concentration, as these can affect income inequality and, in turn, the conversion of economic growth into a drop in poverty rates in beneficiary countries. The GMM estimation results indicated that AfT programmes are beneficial in reducing poverty in countries that diversify their import and export goods, especially manufacturing goods. Furthermore, AfT inflows help to mitigate the increasing poverty effect of income disparity and also lead to better poverty reduction in nations with extensive fiscal redistribution.

4. Model specification and methodology

4.1 Model specification

The study model is based on an existing study on the foreign aid-poverty linkage by Alvi and Senbeta (2012). Several changes were made to the model to examine the AfT impact on poverty rates of 60 recipient countries over the 2009–2018 time period by replacing the overall ODA variable with AfT variables, in addition to some control variables, including age dependency ratio, financial development and democracy score variables, with other variables, namely, inflation and institutional quality. These modifications are due to their insignificant relation with poverty variables, as shown in Alvi and Senbeta's (2012) estimation results. The choice of the list of these countries and the period is dictated by data availability and the methodology applied. Thus, the new model is formulated as follows:

$$\ln Pov_{it} = \alpha_{it} + \beta_1 \ln(AfT_{it}) + \beta_2 \ln(GINI_{it}) + \beta_3 \ln(GDP_{it}) + \beta_4 \ln(INF_{it}) + \beta_5 \ln(TO_{it}) + \beta_6 INST_{it} + \gamma_t + v_i + \varepsilon_{it} \quad (1)$$

[...] where i and t index country and year, respectively, Pov represents the dependent variable poverty. It is measured by both the poverty headcount variable and the poverty gap variable. The poverty headcount index is an indicator of the percentage of the population who live in a household with an income per person that is less than the poverty line of \$1.9 per day. Because of its clarity, it is the most widely used measure of poverty (Le Goff and Singh, 2014). The poverty gap variable determines the mean shortfall of income from the poverty line. This poverty index reflects the average income required to lift the poor over the poverty line as a percentage of the poverty line. The variable of concern is "AfT_{it}", which reflects the actual amounts of AfT inflows (in constant 2018 US dollar prices). This measure is

applied by most of the AfT literature (see, for instance, [Tadesse et al., 2019](#); [Martínez-Zarzoso et al., 2017](#); [Gnangnon, 2019](#), [Gnangnon and Ramirez, 2020](#); [Ly-My et al., 2021](#)). To account for the potential endogeneity, this variable is lagged by one period in the QR. In economic terms, this indicates that today AfT inflows affect poverty after one year. A negative sign is expected for the coefficient of the AfT variable, as it is stated earlier in the theoretical framework that AfT inflows could reduce the poverty levels of the recipient countries by boosting their growth rates. Moreover, in the empirical literature, AfT inflows were also found to have a significant positive effect on the growth rates of developing countries (for instance, [Benziane et al., 2023](#); [Roy et al., 2021](#)). *GINI* is the Gini coefficient for country *i* at time *t*. Higher inequality leads to a lower rate of poverty reduction at any given positive rate of growth, as stated by the famous study of [Ravallion \(1997\)](#). Thus, the Gini coefficient is expected to have a positive sign with higher poverty rates in recipient countries. *GDPC* represents the growth rate of GDP per capita of a recipient country *i* in a specific year *t*. The poverty rate of a country is directly related to the income of the people. This is because an increase in the income of the people can move them out of poverty. Thus, we expect a negative coefficient sign for *GDPC*. The use of this variable in the model is supported by [Le Goff and Singh \(2014\)](#) and [Kaya et al. \(2013\)](#).

The inflation variable denoted *INF*. Prices of goods and services increase in times of high inflation; these increases can affect the poor more than the rich. The average cost of products rises when the nation experiences inflationary patterns, causing vital goods to be unobtainable for the poor category in society. This is primarily because wages do not rise or keep up with increasing costs. After all, they are resilient, which reduces their purchasing power and further deprives the poorer category. According to [Cardoso and Urani \(1995\)](#), there are two means that inflation causes poverty: first, inflation taxes lower real disposable revenue. Second, people's real incomes naturally decrease when nominal salaries rise less than the cost of the products they purchase. The author demonstrated that real wages are the primary way that inflation affects poverty. [Chani et al. \(2011\)](#) examined whether inflation and economic growth contributed to the explanation of Pakistan's high poverty rate between 1972 and 2008. Using the Autoregressive Distributed Lag, the empirical findings demonstrate that inflation has a generally positive effect on poverty. Thus, the coefficient sign between inflation and poverty is expected to be positive.

To represents trade openness. This variable is incorporated into the model to represent the level of international openness. Many studies believe that rising trade volumes may lead to a reduction in poverty rates (for instance, [Perera et al., 2014](#); [Le Goff and Singh, 2014](#)). On the other hand, trade could lead to an increase in poverty rates in numerous other studies (for instance, [Naranpanawa et al., 2011](#); [Barraud and Calfat, 2008](#)). Thus, the trade openness variable is expected to have either a positive or a negative sign with poverty. Following various studies, this variable is calculated as export plus import divided by GDP in the annual current USD prices (for instance, [Rahman et al., 2021](#); [Le Goff and Singh, 2014](#); [Kumari et al., 2023](#)). The *INST* variable represents the mean of the six famous institutional quality variables, namely, control of corruption, government effectiveness, regulatory quality, voice and accountability, rule of law and political stability. Poor institutional quality is usually regarded as harming income disparity. [Chong and Calderón \(2000\)](#) investigated the effect of five alternative measures of institutions on the degree, severity and incidence of poverty. The authors reported that the higher the quality and efficiency of a country's institutions, the lower the level, incidence and severity of poverty. Furthermore, [Tebaldi and Mohan \(2010\)](#) found a negative relationship between institutions and poverty using the Instrumental Variable method for 53 countries across several regions. β_1 indicates the direct impact of aid on poverty after controlling for income (*GDPC*) and distribution components of poverty

(*GINI*). B_3 is the growth elasticity of poverty. γ_t is the year-specific effects. v_i is the unobserved country-specific effects and ε_{it} is the idiosyncratic error term. The utilisation of the natural log in our models is because variables (including real AfT disbursements and real GDP per capita) differ across a great range and have a skewed distribution. In addition, it enables us to interpret the regression estimates as elasticities. Furthermore, to account for the impact of aggregate AfT on poverty is more pronounced in countries with a better governance environment, a new model is specified as follows:

$$\ln Pov_{it} = \alpha_{it} + \beta_1 \ln(AfTCST_{it-1}) + \beta_2 \ln(GINI_{it}) + \beta_3 \ln(GDPC_{it}) + \beta_4 \ln(INF_{it}) + \beta_5 \ln(TO_{it}) \\ + \beta_6 (GE_{it}) + \beta_7 \{ \ln(AfTCST)_{it-1} * GE_{it} \} + \gamma_t + v_i + \varepsilon_{it} \quad (2)$$

where other variables are as previously defined. The interaction variable “ $AfTCST*GE$ ” represents the vector for the interaction term between aggregate AfT and the government effectiveness variable. Recipient countries with more effective governance and lower levels of corruption are expected to benefit more from the AfT inflows compared to the recipient countries with poor effective governance and higher levels of corruption. Thus, the sign of this interaction variable is expected to be negative. Table 3 displays the outcomes of the descriptive statistics of the main variables applied in the model. Table 4 provides the correlation matrix of all variables used in the analysis. Appendix 1 explains the variable measurements and sources. Appendix 2 shows the sample of countries used in the study.

Table 4 reveals that total AfT is positively and significantly correlated with both poverty variables. These positive correlations may merely suggest that nations with greater poverty rates receive more AfT inflows, instead of implying a causal impact on poverty.

4.2 Empirical methodology

The QR approach may lead to more favourable policy implications by demonstrating whether the AfT effect is stronger or weaker among the higher poverty rate recipients compared to the lower poverty rate recipients. In the case of panel data, QR has drawn significant attention in both theoretical and empirical studies (Gu and Volgushev, 2019). It allows for the exploration of numerous conditional quantiles, uncovering numerous types of conditional heterogeneity and adjusting for unobserved individual effects (Kato *et al.*, 2012). This would provide a more adaptable method of panel data analysis than the traditional Gaussian fixed and random effects estimation (Kato *et al.*, 2012). Consequently, QR for panel data is used in this work, as described by Canay (2011). This author suggests a simple adjustment to account for FE, assuming that they are position shifters. In other words, FE function as variables that affect all quantiles equally. The author offers a two-step method that comprises, as a first step, utilising a within-FE model to estimate nation-FE and, as a second step, using the consistently estimated FE to demean the dependent variable ($\log Pov$), and this demeaned variable is employed as a dependent variable in QR. The estimated $\tilde{\mu}_i$ are used to transform $\log(Pov)$ into $\tilde{Y}_{it} = \log(Y_{it}) - \tilde{\mu}_i$, where Y_{it} represents here the Pov variable.

5. Results and discussion

The QR is based on five different quantiles, including the 10th, 25th, 50th, 75th and the 90th. The poverty distribution of the 10th and the 25th quantiles represent the non-LDCs, whereas the 75th and the 90th quantiles represent the LDCs.

Table 3. Summary statistics

Variable	Measurement unit	Obs	Mean	SD	Min	Max
POVERTY HEADCOUNT	Percentage of population living below the poverty line	599	17.312	22.807	0.006	89.052
POVERTY GAP	The mean shortfall of income from the poverty line	599	6.607	10.352	0	54.004
AFTOTCST	Constant 2018 US dollar millions	598	304.865	404.995	3.274	2949.43
GINI	Scaled between 0 and 100	600	58.595	27.907	25.662	100
GDPC	Annual growth in percentage	600	2.372	3.16	-13.519	18.066
INF	In percentage of GDP	600	5.518	3.926	-1.815	30.507
TO	Sum of imports and exports as percentage of GDP	600	72.998	28.339	22.106	162.559
GE	Scaled from -2.5 to 2.5	600	-0.403	0.595	-2.078	1.273
INST	Scaled from -2.5 to 2.5	600	-0.414	0.54	-1.718	1.444

Note(s): POYHEADCOUNT = Poverty headcount index, POVEGAP = Poverty gap index, AFTCST = Aggregate Aid for Trade in constant prices. GINI = Gini coefficient, GDPC = GDP per capita growth rate, INF = 1 plus inflation rate, TO = Trade Openness, GE = Government Effectiveness index, INST = The mean of the six institutional Quality indexes

Source(s): Authors' own work

Table 4. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) ln_Poverty Headcount	1.000								
(2) ln_Poverty GAP	0.989	1.000							
(3) ln_AfTCST	0.146	0.103	1.000						
(4) ln_GINI	0.305	0.302	0.042	1.000					
(5) GDPC	-0.099	-0.114	0.078	-0.062	1.000				
(6) ln_INF	0.039	0.025	0.131	0.108	0.024	1.000			
(7) ln_TO	-0.286	-0.283	-0.336	-0.040	0.042	-0.125	1.000		
(8) GE	-0.636	-0.615	-0.119	-0.116	0.093	-0.095	0.153	1.000	
(9) INST	-0.594	-0.567	-0.136	-0.099	0.058	-0.089	0.146	0.943	1.000

Source(s): Authors' own work

5.1 Effect of aggregate aid for trade on poverty

This effect is examined by analysing the aggregate AfT-headcount ratio first, followed by the AfT-poverty gap. The estimation results using the headcount ratio are presented in Table 5. The 50th quantile (Q50) represents regression through the median. Advocates of QR focus such analyses on the lower and upper quantiles. Considering our main variable, AfT, we observed an interesting result across the quantiles. In the lower middle quantiles (Q10, Q25 and Q50), the effect of AfT was negative and significant at the 1% level. However, starting from the 75th quantile up to the 90th quantile, the effect changes to positive at the same significance levels. Contrary to the assumption that the effect of AfT tended to be more pronounced in the LDCs, the result suggested that total AfT only alleviates poverty in the non-LDCs. The QR coefficient revealed the effect of a unit change in the independent variables on that specific quantile. For example, in the 10th quantile, a 1% increase in the inflows of AfT for countries located in the 10th quantile (non-LDCs) was associated with a 0.10% reduction in the headcount ratio, however, in the case of the LDCs, AfT increased to a 0.7% in the headcount ratio.

Concerning other explanatory variables, the estimates of the Gini coefficient, GDP per capita and trade openness enter with the expected signs across all quantiles, which is consistent with the findings of Alvi and Senbeta (2012). Particularly, a higher Gini coefficient, which represents higher income inequality, increased the percentage of people living under the poverty line and the poor's average income shortfall, which is consistent with the results found in the literature by Ravallion and Chen (1997), Collier and Dollar (2002), Alvi and Senbeta (2012) and Kaya *et al.* (2013). In addition, a great number of empirical studies indicated that faster and more consistent growth is a significant factor in reducing poverty (for instance, Alvi and Senbeta, 2012; Kaya *et al.*, 2013). As can be observed from the results in Table 5, at the 1% level, GDP per capita is negatively related to both the poverty headcount ratio. The inflation rate is expected to affect the poor negatively by raising the prices of goods, which in turn reduces the wage values and purchasing power of the household. However, the quantile analysis does not confirm this economic postulation and shows positive and significant effects of inflation for both poverty indices across all the quintiles. On the contrary, the measure of trade openness generates a significant negative coefficient in all quantiles, particularly in the lower quantiles (the non-LDCs). These results suggest that recipients with lower poverty rates benefit from trade openness more, whereas recipients with higher poverty rates do not. Given that trade promotes economic growth prospects and the link between growth and poverty reduction, trade policy has a role to play in efforts both to promote economic development and to reduce poverty. In other words, the

Table 5. Effect of aggregate aid for trade on poverty

Variables	(1) Q10	(2) Q25	(3) Q50	(4) Q75	(5) Q90
$\ln (AFTCST)_{t-1}$	-0.10446*** (0.02211)	-0.29725*** (0.00429)	-0.06343*** (0.00837)	0.24557*** (0.00817)	0.37988*** (0.01360)
$\ln (GINI)$	0.36905*** (0.06934)	0.85228*** (0.01572)	0.41162*** (0.03434)	0.90189*** (0.07104)	0.59657*** (0.09671)
GDPG	0.04103*** (0.00875)	-0.06477*** (0.00223)	-0.00946*** (0.00349)	-0.04881*** (0.00678)	-0.04009*** (0.00568)
$\ln (INF)$	-0.57347*** (0.10433)	-0.31286*** (0.00547)	-0.32872*** (0.01451)	-0.27075*** (0.02269)	-0.07526*** (0.01847)
$\ln (to)$	-2.03356*** (0.16065)	-1.38091*** (0.02112)	-0.99359*** (0.03095)	-0.16886*** (0.03472)	-0.00686 (0.03159)
INST	-2.37997*** (0.05550)	-2.99317*** (0.00909)	-1.92525*** (0.01759)	-1.79052*** (0.01038)	-1.81739*** (0.02071)
Observations	538	538	538	538	538
Number of groups	60	60	60	60	60

Note(s): The dependent variable is the poverty headcount ratio. The significance levels are indicated as follows: ***, ** and * for 1, 5 and 10%, respectively. Robust standard errors are reported in brackets. Country fixed effects are taken into account, and year dummies are included in all regressions. Quantile regression results are based on 1,000 bootstrapping repetitions; dependent variable: headcount ratio

Source(s): Authors' own work

upper-middle and high-income recipients have better trade systems and are more involved in the world trading systems compared to the LDCs. The mean institutional quality variable is negatively associated with both poverty rates across all quantiles, particularly the 10th quantile (countries with the lowest poverty rates). This result is in line with [Chong et al. \(2009\)](#) findings and confirms the economic postulation.

The results of QR in evaluating the depth of poverty represented by the poverty gap are also shown in [Table 6](#). The results were similar to what was observed in the previous QR s in [Table 5](#). In the case of AfT, the estimates showed that the lower-middle quantiles had a negative association with the poverty gap at the 1% significance level. From the 75th through to the 90th quantile, the coefficients on aggregate AfT showed a positive association with the poverty gap and were significant at either the 1% level, as we observed. In terms of magnitude, the 25th quantile showed the largest negative estimate. This will further support the claim that AfT tended to be more effective in reducing poverty in non-LDCs. Thus, holding other factors constant at the 25th quantile, a percentage increase in total AfT inflows were associated with a 0.17% reduction in the poverty gap. In contrast, the 90th quantile demonstrated that total AfT inflows were associated with a 0.26% increase in the poverty gap of the LDCs. The findings concerning other variables are similar to those obtained in [Table 5](#).

These findings are consistent with the large body of literature that supports the positive impact of foreign aid on poverty (for instance, [Collier and Dollar, 2002](#); [Alvi and Senbeta, 2012](#); [Kaya et al., 2013](#)). The finding that AfT has poverty-reducing effects even after controlling for average income is noteworthy and has important policy implications. It means that despite the controversy surrounding the aid-growth relation, the direct effect of AfT indeed helps reduce poverty, even though its effects on growth remain uncertain. Despite these useful results and policy implications, the effect of total AfT is more pronounced in the non-LDCs compared to the LDCs. This result does not agree with or is not in line with the main purpose of creating the AfT initiative as is stated in Paragraph 5 of the [WTO \(2006\)](#) task force which states that the main goal of the AfT initiative is to:

Help developing countries, particularly the least developed countries, to expand trade, to incorporate into the global trading system and benefit more from the WTO agreements. Thus, boosting growth rates and reducing poverty levels in recipient countries, ([OECD/WTO, 2013](#), p. 146).

This result could be due to the poor institutional quality of the LDCs, which led them to not fully benefit from the AfT inflows correctly. This conclusion is made depending on the institutional quality variable results in [Tables 5 and 6](#), which demonstrate the positive effect of the mean institutional quality variable in the case of the LDCs compared to the non-LDCs. In numbers, a percentage increase in total AfT inflows was associated with a 0.023 reduction in the headcount ratio of the LDCs. On the contrary, total AfT inflows were associated with a 0.018 increase in the poverty gap of the LDCs. The UN Conference of Trade and Development (UNCTAD) report in 2021 supports these results, stating that the LDCs, in other terms, low-income countries, are at the bottom of the Productive Capacities Index (PCI) distribution, with limited capacity to formulate reasonable strategies and even less ability to implement them, as well as weak institutional coherence and fragmented or inconsistent laws and regulations. Poor governance quality plagues some countries in these categories, limiting institutions' ability to function effectively ([UNCTAD, 2021](#), p. 47). The PCI is defined as an indicator that is useful to detect important economic development obstacles and reshape policy interventions, as well as motivations, to overcome them. PCI is also a reliable and comprehensive instrument for monitoring progress against national and

Table 6. Effect of aggregate aid for trade on poverty

Variables	(1) Q10	(1) Q25	(1) Q50	(1) Q75	(1) Q90
$\ln(AITCST)_{t-1}$	-0.17692*** (0.04277)	-0.32985*** (0.04585)	-0.11153*** (0.00625)	0.25090*** (0.01677)	0.26563*** (0.02434)
$\ln(\text{Gini})$	0.76631*** (0.07628)	1.05334*** (0.03585)	1.42948*** (0.02117)	0.78081*** (0.07585)	0.62080*** (0.13713)
GDPC	-0.04291*** (0.00838)	-0.09376*** (0.00589)	-0.08459*** (0.00314)	-0.06720*** (0.00613)	-0.08157*** (0.00630)
$\ln(\text{INF})$	-0.20748*** (0.05065)	-0.17207*** (0.00827)	-0.29418*** (0.01068)	-0.13285*** (0.03363)	-0.07535*** (0.01767)
$\ln(\text{TO})$	-1.88918*** (0.07921)	-1.54822*** (0.05440)	-1.29980*** (0.03961)	-0.12539** (0.05558)	0.19195** (0.09000)
INSTQUAL	-2.73042*** (0.08120)	-3.09716*** (0.02935)	-2.50118*** (0.02660)	-2.02422*** (0.04529)	-1.78239*** (0.04075)
Observations	538	538	538	538	538
Number of groups	60	60	60	60	60

Note(s): The dependent variable is the poverty gap ratio. The significance levels are indicated as follows: ***, ** and * for 1, 5 and 10%, respectively. Robust standard errors are reported in brackets. Country fixed effects are taken into account and year dummies are included in all regressions. Quantile regression results are based on 1,000 bootstrapping repetitions; dependent variable: poverty gap

Source(s): Authors' own work

international development targets and objectives, such as the SDGs (UNCTAD, 2021, p. 11). Therefore, further investigation on the importance of better governance effectiveness in improving the total AfT beneficial effect is performed in Sub-section 5.2.

5.2 Further analysis: does the effect of aid for trade on poverty depend on the governance quality of the recipient countries?

The analysis has so far consisted of how total AfT could affect both the poverty headcount ratio and the poverty gap. In this section, we further investigate whether this effect depends on the quality of governance prevailing in the recipient countries. In light of the theoretical discussion provided earlier, this study postulates that AfT inflows particularly, AfT for policy and regulations aims, to help policymakers in recipient countries of AfT policies and regulations to better understand and comply with WTO Agreements and Decisions and, ultimately, ensure the predictability and transparency of their trade policies. Thus, better institutional and governance quality could help improve the business environment and enhance trade flows, which could, in turn, further enhance growth rates and decrease poverty levels in the AfT recipient countries. To examine whether this effect depends on the governance effectiveness of the recipient countries, this study specifies Model (2), which estimates the interaction between the government effectiveness variable and the aggregate AfT variable. The outcome of the estimation is presented in Table 7. In line with various pieces of literature, such as Chong and Calderón (2000) and Tebaldi and Mohan (2010). Poor institutional quality, as assessed by inadequate governance quality, generally worsens the poverty situation. The results in Table 7 confirm this literature and show that improvements in government effectiveness are related to reductions in poverty levels across all quantiles, particularly the LDCs. This means that poor recipients could benefit significantly from AfT inflows if they improve their governance environment. Particularly, the coefficient related to the interaction variable (AfTCST*GE) is negative and statistically significant at the 1% level on both poverty headcount and poverty gap, across the upper middle quantiles (the 50th, the 75th and the 90th). This finding suggests that AfT flows will significantly lower poverty rates in the LDCs provided they enhance the quality of their governance. Specifically, 1% increase in the real total AfT inflows is, respectively, given by (0.11; 0.14) and (0.086; 0.089) increases in the headcount ratio and the poverty gap ratios of the LDCs. This result signifies that poor government quality reduces the efficiency and the speed of allocating AfT flows to the poor. Thus, recipient countries need to work on improving their governance quality to allocate the AfT inflows more effectively.

6. Conclusion

Poverty is undoubtedly one of the primary concerns of many developing countries and international organisations. The UN, for instance, posited fighting poverty as the first goal of the 2030 SDGs agenda, “SDGs1, No poverty”. On the other hand, bilateral and multilateral aid, particularly AfT inflows, have long been considered critical tools to achieve this latter goal. Since its launch at the 2005 Hong Kong Ministerial Conference, AfT inflows have assisted developing countries in improving their trade capacity, boosting the benefits from global trade growth and, eventually, reducing poverty. Despite rising interest among scholars in studying the effectiveness of this type of foreign aid on trade outcomes, there is little evidence of its role in alleviating poverty in these countries. The current study aims to fill this study gap by analysing the impact of overall AfT on the poverty of 60 recipient nations by applying the QR approach. This method allows us to examine how AfT inflows affect various quantiles of poverty and determine whether this effect is more or weaker in LDCs compared to non-LDCs. The results revealed that AfT in aggregate is positively and

Table 7. Effect of aggregate aid for trade on poverty: the role of governance quality

Variables	Q10	Q25	Q50	Q75	Q90
$\ln(AITCST)_{t-1}$	-0.16660*** (0.02655)	-0.07428*** (0.00810)	0.23950*** (0.01244)	0.24741*** (0.01074)	0.28464*** (0.00781)
$\ln(Gini)$	1.06605*** (0.05296)	1.27391*** (0.01771)	0.33995*** (0.04779)	0.52796*** (0.04200)	0.29885*** (0.04041)
GDPC	-0.04775*** (0.00998)	-0.03884*** (0.00353)	-0.02091*** (0.00366)	0.01388*** (0.00376)	-0.00561** (0.00293)
$\ln(INF)$	-0.09817*** (0.03170)	-0.13783*** (0.05794)	-0.17382*** (0.02452)	-0.13618*** (0.01052)	-0.13675*** (0.00927)
$\ln(TO)$	-1.72928*** (0.08000)	-1.04705*** (0.08724)	-0.25027*** (0.04322)	-0.39287*** (0.03785)	0.28729*** (0.03120)
GovEff	-4.14166*** (0.24492)	-3.11089*** (0.09462)	-1.28918*** (0.06772)	-1.50999*** (0.04055)	-1.05264*** (0.09743)
$\ln(AITCST)*GE$	0.34493*** (0.04134)	0.13520*** (0.02203)	-0.05822*** (0.01211)	-0.11287*** (0.00939)	-0.14412*** (0.01910)
Observations	538	538	538	538	538
Number of groups	60	60	60	60	60

Note(s): Dependent variables are poverty headcount and poverty gap ratios. The significance levels are indicated as follow: ***, ** and * for 1, 5 and 10%, respectively. Robust standard errors are reported in brackets. Country fixed effects are taken into account and year dummies are included in all regressions. Quantile regression results are based on 1,000 bootstrapping repetitions

Source(s): Authors' own work

(continued)

Note(s): Dependent variables are poverty headcount and poverty gap ratios. The significance levels are indicated as follow: ***, ** and * for 1, 5 and 10%, respectively. Robust standard errors are reported in brackets. Country fixed effects are taken into account and year dummies are included in all regressions. Quantile regression results are based on 1,000 bootstrapping repetitions

Source(s): Authors' own work

(continued)

Table 7. Continued

Variables	Dependent variable: the poverty gap				
	Q10	Q25	Q50	Q75	Q90
$\ln (AfTCST)_{t-1}$	-0.18327*** (0.00713)	-0.06757*** (0.01529)	-0.09804*** (0.01554)	0.19787*** (0.00823)	0.27661*** (0.00634)
$\ln (Gini)$	1.01583*** (0.02040)	1.00271*** (0.08166)	1.49493*** (0.02749)	0.80004*** (0.04196)	0.66650*** (0.02194)
GDP	-0.03907*** (0.00385)	-0.01319* (0.00749)	-0.05017*** (0.00434)	-0.02415*** (0.00415)	0.00160 (0.00224)
$\ln (INF)$	-0.38030*** (0.00913)	-0.30857*** (0.05464)	-0.36429*** (0.02311)	-0.11668*** (0.02622)	-0.14904*** (0.01433)
$\ln (TO)$	-2.45921*** (0.03702)	-1.85117*** (0.04328)	-0.91256*** (0.04102)	0.66735*** (0.20512)	0.00461 (0.01577)
GovEff	-3.69833*** (0.06301)	-2.84686*** (0.10481)	-2.06130*** (0.12080)	-1.52666*** (0.15158)	-1.49295*** (0.03741)
$\ln (AfTCST)* GE$	0.26518*** (0.01128)	0.06752*** (0.02145)	-0.06064** (0.02541)	-0.08607*** (0.02341)	-0.08993*** (0.00822)
Observations	538	538	538	538	538
Number of groups	60	60	60	60	60

significantly correlated with poverty reduction. However, this positive impact is only true for non-LDCs. On the contrary, in a more effective governance environment, total AfT inflows appear to lower poverty levels across all 60 recipients, with LDCs benefitting the most from this effect. These results might suggest the possibility for recipient governments to spend AfT inflows on consumption rather than investment. Thus, policymakers in these countries must enforce coherent policy measures to combat higher levels of corruption while also boosting human capital development through appropriate policies for skill development and entrepreneurship. The LDCs do need more AfT inflows, however, these inflows must be highly directed towards improving the quality of governance and reducing corruption levels. The limitation of this study stems from the fact that the impact of AfT inflows was studied on a sample of 60 developing countries, hence, generalising the findings to all nations may not be accurate. Therefore, future studies on individual countries are needed using a longer time framework and the latest AfT data.

References

- Afridi, M.A. and Ventelou, B. (2013), "Impact of health aid in developing countries: the public vs. the private channels", *Economic Modelling*, Vol. 31, pp. 759-765.
- Alonso, A. (2016), "Aid for trade: building productive and trade capacities in LDCs", *CDP Policy Review No. 1, United Nations Committee for Development Policy*. [Preprint], available at: www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/CDP-review-2016-1.pdf
- Alvi, E. and Senbeta, A. (2012), "Does foreign aid reduce poverty?" *Journal of International Development*, Vol. 24 No. 8, pp. 955-976.
- Arndt, C., Jones, S. and Tarp, F. (2015), "Assessing foreign aid's long-run contribution to growth and development", *World Development*, Vol. 69, pp. 6-18.
- Arvin, B.M. and Barillas, F. (2002), "Foreign aid, poverty reduction, and democracy", *Applied Economics*, Vol. 34 No. 17, pp. 2151-2156.
- Barraud, A.A. and Calfat, G. (2008), "Poverty effects from trade liberalisation in Argentina", *The Journal of Development Studies*, Vol. 44 No. 3, pp. 365-383.
- Beck, T., Demirgüç-Kunt, A. and Levine, R. (2007), "Finance, inequality and the poor", *Journal of Economic Growth*, Vol. 12 No. 1, pp. 27-49.
- Benziane, Y., Law, S.H., Abd Rahman, M.D. and Rosland, A. (2023), "Aid for trade and economic growth: does the quality of institutions matter?" *International Journal of Academic Research in Economics and Management Sciences*, Vol. 12 No. 1.
- Birchler, K. and Michaelowa, K. (2016), "Making aid work for education in developing countries: an analysis of aid effectiveness for primary education coverage and quality", *International Journal of Educational Development*, Vol. 48, pp. 37-52.
- Boone, P. (1996), "Politics and the effectiveness of foreign aid", *European Economic Review*, Vol. 40 No. 2, pp. 289-329.
- Burnside, C. and Dollar, D. (2000), "Aid, policies, and growth", *American Economic Review*, Vol. 90 No. 4, pp. 847-868, doi: [10.1257/aer.90.4.847](https://doi.org/10.1257/aer.90.4.847).
- Calì, M. and Te Velde, D.W. (2011), "Does aid for trade really improve trade performance?" *World Development*, Vol. 39 No. 5, pp. 725-740, doi: [10.1016/j.worlddev.2010.09.018](https://doi.org/10.1016/j.worlddev.2010.09.018).
- Canay, I.A. (2011), "A simple approach to quantile regression for panel data", *The Econometrics Journal*, Vol. 14 No. 3, pp. 368-386.
- Cardoso, E. and Urani, A. (1995), "Inflation and unemployment as determinants of inequality in Brazil: the 1980s", *Reform, Recovery, and Growth: Latin America and the Middle East*, University of Chicago Press, pp. 151-176.

- Chani, M.I., Pervaiz, Z., Jan, S.A., Ali, A. and Chaudhary, A.R. (2011), "Poverty, inflation and economic growth: empirical evidence from Pakistan", *World Applied Sciences Journal*, Vol. 14 No. 7, pp. 1058-1063.
- Chong, A. and Calderón, C. (2000), "Institutional quality and poverty measures in a cross-section of countries", *Economics of Governance*, Vol. 1 No. 2, pp. 123-135.
- Chong, A., Gradstein, M. and Calderon, C. (2009), "Can foreign aid reduce income inequality and poverty?" *Public Choice*, Vol. 140 Nos 1/2, pp. 59-84.
- Christensen, Z., Homer, D. and Nielson, D.L. (2011), "Dodging adverse selection: how donor type and governance condition aid's effects on school enrollment", *World Development*, Vol. 39 No. 11, pp. 2044-2053.
- Collier, P. and Dollar, D. (2002), "Aid allocation and poverty reduction", *European Economic Review*, Vol. 46 No. 8, pp. 1475-1500.
- d'Aiglepieerre, R. and Wagner, L. (2013), "Aid and universal primary education", *Economics of Education Review*, Vol. 37, pp. 95-112.
- Dollar, D. and Kraay, A. (2004), "Trade, growth, and poverty", *The Economic Journal*, Vol. 114 No. 493, pp. F22-F49.
- Dreher, A., Nunnenkamp, P. and Thiele, R. (2008), "Does aid for education educate children? Evidence from panel data", *The World Bank Economic Review*, Vol. 22 No. 2, pp. 291-314.
- Durowah, O. (2017), "The role of aid for trade and foreign direct investment in poverty reduction: a panel data analysis of 91 developing countries", South Dakota State University.
- Easterly, W. (2003), "Can foreign aid buy growth?" *Journal of Economic Perspectives*, Vol. 17 No. 3, pp. 23-48.
- Farag, M., Nandakumar, A.K., Wallack, S., Hodgkin, D., Gaumer, G. and Erbil, C. (2013), "Health expenditures, health outcomes and the role of good governance", *International Journal of Health Care Finance and Economics*, Vol. 13 No. 1, pp. 33-52.
- Feeny, S. and Ouattara, B. (2013), "The effects of health aid on child health promotion in developing countries: cross-country evidence", *Applied Economics*, Vol. 45 No. 7, pp. 911-919.
- Fielding, D. (2011), "Health aid and governance in developing countries", *Health Economics*, Vol. 20 No. 7, pp. 757-769.
- Gnangnon, S.K. (2018), "Impact of multilateral trade liberalization and aid for trade for productive capacity building on export revenue instability", *Economic Analysis and Policy*, Vol. 58, pp. 141-152, doi: [10.1016/j.eap.2018.02.002](https://doi.org/10.1016/j.eap.2018.02.002).
- Gnangnon, S.K. (2019), "Does the impact of aid for trade on export product diversification depend on structural economic policies in recipient-countries?" *Economic Issues*, Vol. 24 No. 1, pp. 59-87.
- Gnangnon, S.K. (2021), "Aid for trade flows and poverty reduction", *The Singapore Economic Review*, pp. 1-44, doi: [10.1142/S0217590821500685](https://doi.org/10.1142/S0217590821500685).
- Gnangnon, S.K. and Ramirez, S.D.M. (2020), "Aid for trade flows and recipient-countries' integration into the world market for services exports: do merchandises exports and foreign direct investment inflows matter?", *Journal of International Commerce, Economics and Policy*, pp. 1-37, doi: [10.1142/S1793993323500011](https://doi.org/10.1142/S1793993323500011).
- Gu, J. and Volgushev, S. (2019), "Panel data quantile regression with grouped fixed effects", *Journal of Econometrics*, Vol. 213 No. 1, pp. 68-91.
- Gyimah-Brempong, K. (2015), "Do African countries get health from health aid?" *Journal of African Development*, Vol. 17 No. 2, pp. 83-114.
- Iyoha, M.A. (2004), "Foreign aid and economic development in Africa", *Macroeconomics: Theory and Policy*, Mindex Publishing, Benin City, [Preprint].
- Jeanneney, S.G. and Kpodar, K. (2011), "Financial development and poverty reduction: can there be a benefit without a cost?" *Journal of Development Studies*, Vol. 47 No. 1, pp. 143-163.

- Kato, K., Galvao, A.F. Jr. and Montes-Rojas, G.V. (2012), "Asymptotics for panel quantile regression models with individual effects", *Journal of Econometrics*, Vol. 170 No. 1, pp. 76-91.
- Kaya, O., Kaya, I. and Gunter, L. (2013), "Foreign aid and the quest for poverty reduction: is aid to agriculture effective?" *Journal of Agricultural Economics*, Vol. 64 No. 3, pp. 583-596.
- Kizhakethalackal, E.T., Mukherjee, D. and Alvi, E. (2013), "Quantile regression analysis of health-aid and infant mortality: a note", *Applied Economics Letters*, Vol. 20 No. 13, pp. 1197-1201.
- Kumari, R., Shabbir, M.S., Saleem, S., Yahya Khan, G., Abbasi, B.A. and Lopez, L.B. (2023), "An empirical analysis among foreign direct investment, trade openness and economic growth: evidence from the Indian economy", *South Asian Journal of Business Studies*, Vol. 12 No. 1, pp. 127-149.
- Le Goff, M. and Singh, R.J. (2014), "Does trade reduce poverty? A view from Africa", *Journal of African Trade*, Vol. 1 Nos 1/2, pp. 5-14.
- Ly-My, D., Lee, H. and Park, D. (2021), "Does aid for trade promote import diversification?", *The World Economy*, Vol. 44 No. 6, pp. 1740-1769.
- Mahembe, E. and Odhiambo, N.M. (2020), "Development aid and its impact on poverty reduction in developing countries", *International Journal of Development Issues*, Vol. 19 No. 2, pp. 145-168, doi: [10.1108/IJDI-08-2019-0144](https://doi.org/10.1108/IJDI-08-2019-0144).
- Martínez-Zarzoso, I., Nowak-Lehmann, D.F. and Rehwald, K. (2017), "Is aid for trade effective? A panel quantile regression approach", *Review of Development Economics*, Vol. 21 No. 4, pp. e175-e203, doi: [10.1111/rode.12322](https://doi.org/10.1111/rode.12322).
- Masud, N. and Yontcheva, B. (2005), "Does foreign aid reduce poverty? Empirical evidence from nongovernmental and bilateral aid", available at: <https://ssrn.com/abstract=887969> or [10.2139/ssrn.887969](https://doi.org/10.2139/ssrn.887969).
- Michaelowa, K. and Weber, A. (2006), "Aid effectiveness in the education sector: a dynamic panel analysis", *Theory and Practice of Foreign Aid*, Emerald Group Publishing, Bingley.
- Mishra, P. and Newhouse, D. (2009), "Does health aid matter?" *Journal of Health Economics*, Vol. 28 No. 4, pp. 855-872.
- Mukherjee, D. and Kizhakethalackal, E.T. (2013), "Empirics of health-aid, education and infant mortality: a semiparametric study", *Applied Economics*, Vol. 45 No. 22, pp. 3137-3150.
- Nakamura, T. and McPherson, M.F. (2005), "Is foreign aid effective in reducing poverty", *World*, pp. 1-25.
- Naranpanawa, A., Bandara, J.S. and Selvanathan, S. (2011), "Trade and poverty nexus: a case study of Sri Lanka", *Journal of Policy Modeling*, Vol. 33 No. 2, pp. 328-346.
- OECD/WTO (2013), *Aid for Trade at a Glance: Connecting to Value Chains*, WTO, Geneva/OECD Publishing, Paris, doi: [10.1787/aid_glance-2013-en](https://doi.org/10.1787/aid_glance-2013-en).
- OECD/WTO (2015), "Aid for trade at a glance 2015: reducing trade costs for inclusive", *Sustainable Growth*, OECD Publishing, Paris, doi: [10.30875/e44dfb7d-en](https://doi.org/10.30875/e44dfb7d-en).
- OECD/WTO (2019), *Aid for Trade at a Glance: Economic Diversification and Empowerment*, OECD Publishing, Paris, doi: [10.1787/c17e17f1-fr](https://doi.org/10.1787/c17e17f1-fr).
- OECD/WTO (2022), *Aid for Trade at a Glance 2022: Connected, Empowering Trade, Sustainable*, OECD, Paris.
- Perera, S., Siriwardana, M. and Mounter, S. (2014), "Reducing poverty and income inequality in Sri Lanka: does trade liberalisation help?" *Journal of the Asia Pacific Economy*, Vol. 19 No. 4, pp. 629-655.
- Rahman, M.M., Rahman, M.M., Rahman, M. and Masud, M.A.K. (2021), "The impact of trade openness on the cost of financial intermediation and bank performance: evidence from BRICS countries", *International Journal of Emerging Markets*, Vol. 18 No. 10, pp. 3550-3587.
- Ravallion, M. (1997), "Can high-inequality developing countries escape absolute poverty?" *Economics Letters*, Vol. 56 No. 1, pp. 51-57.

- Ravallion, M. and Chen, S. (1997), "What can new survey data tell us about recent changes in distribution and poverty?" *The World Bank Economic Review*, Vol. 11 No. 2, pp. 357-382.
- Roy, C.K., Xiaoling, H. and Banik, B. (2021), "Achieving SDG target 8.1 (sustain economic growth) in developing countries: how aid for trade policy and regulations can assist?" *Journal of Chinese Economic and Foreign Trade Studies*, Vol. 14 No. 3, pp. 257-276, doi: [10.1108/JCEFTS-12-2020-0071](https://doi.org/10.1108/JCEFTS-12-2020-0071).
- Singh, R.J. and Huang, Y. (2015), "Financial deepening, property rights, and poverty: evidence from Sub-Saharan Africa", *Journal of Banking and Financial Economics*, Vol. 1 No. 3, pp. 130-151.
- Tadesse, B., Shukralla, E. and Fayissa, B. (2019), "Institutional quality and the effectiveness of aid for trade", *Applied Economics*, Vol. 51 No. 39, pp. 4233-4254, doi: [10.1080/00036846.2019.1589644](https://doi.org/10.1080/00036846.2019.1589644).
- Taylor, E.M., Hayman, R., Crawford, F., Jeffery, P. and Smith, J. (2013), "The impact of official development aid on maternal and reproductive health outcomes: a systematic review", *PLoS ONE*, Vol. 8 No. 2, p. e56271.
- Tebaldi, E. and Mohan, R. (2010), "Institutions and poverty", *Journal of Development Studies*, Vol. 46 No. 6, pp. 1047-1066.
- United Nations (2015), "Outcome document of the third international conference on financing for development: Addis Ababa action agenda", The Third International Conference on Financing for Development, *Addis Ababa*, available at: <https://undocs.org/pdf?symbol=en/A/CONF.227/20>
- United Nations Conference on Trade and Development (UNCTAD) (2016), *Making Trade Work for Least Developed Countries: A Handbook for Mainstreaming Trade*, UNCTAD, Geneva, available at: <https://unctad.org/publication/making-trade-work-least-developed-countries-handbook-mainstreaming-trade>
- UNCTAD (2021), "UNCTAD productive capacities index: methodological approach and results", UN.
- Williamson, C.R. (2008), "Foreign aid and human development: the impact of foreign aid to the health sector", *Southern Economic Journal*, Vol. 75 No. 1, pp. 188-207.
- Wilson, S.E. (2011), "Chasing success: health sector aid and mortality", *World Development*, Vol. 39 No. 11, pp. 2032-2043.
- World Bank (2018), *Poverty and Shared Prosperity 2018: Piecing Together the Poverty Puzzle*, *Poverty and Shared Prosperity*, The World Bank, doi: [10.1596/978-1-4648-1330-6](https://doi.org/10.1596/978-1-4648-1330-6).
- World Bank (2020), "Poverty and shared prosperity 2020: reversals of fortune", *The World Bank*, available at: www.worldbank.org/en/publication/poverty-and-shared-prosperity-2020
- World Bank (2022), "Poverty and shared prosperity 2022: correcting course", *The World Bank*, available at: www.worldbank.org/en/publication/poverty-and-shared-prosperity
- WTO (2006), "Task force", Vol. 6 No. 4, pp. 1-18.
- Yogo, U.T. and Mallye, D. (2015), "Health aid and health improvement in Sub-Saharan Africa: Accounting for the heterogeneity between stable states and post-conflict states", *Journal of International Development*, Vol. 27 No. 7, pp. 1178-1196.

Appendix 1

Table A1. Variables measurements and sources

Variables	Measurements	Sources
The Headcount Ratio	The proportion of people living below the poverty line (\$1.90 a day at 2011 global prices)	The Poverty and inequality dataset (PovcalNet) of the World Bank
The Poverty Gap	The average income shortfall as a share of the poverty line	The Poverty and inequality dataset (PovcalNet) of the World Bank
AfTCST	Total Real Gross Disbursements of Aid for Trade, in constant 2018 US dollar Prices	Data for AfT variables were extracted from the OECD/DAC- International Development Statistics (IDS) online databases and then calculated by the authors. Total AfT data covers the following three categories: AfT Economic Infrastructure (210;220;230), AfT Productive Capacity Building (240;250;311; 312;321;322;332), and AfT category and regulations covers trade policy and regulations and trade-related adjustment (331)
GDPC	GDP per capita growth rate	The World Development Indicators of the World Bank
GINI	The GINI coefficient. A Gini index of 0 indicates perfect equality and 100 indicates perfect inequality	The Poverty and inequality dataset (PovcalNet) of the World Bank
INF	One plus the inflation rate	The World Development Indicators of the World Bank
TO	The sum of imports and exports as a ratio to recipient countries' GDP	The World Development Indicators of the World Bank
GE	Government Effectiveness variable. It ranges from approximately -2.5 to 2.5	The Worldwide Governance Indicator of the World Bank
INST	The mean of the six famous institutional quality variables, namely (control of corruption, government effectiveness, regulatory quality, voice and accountability, rule of law and political stability); it ranges from approximately -2.5to 2.5	The Worldwide Governance Indicator of the World Bank

Source(s): Authors' own work

Table A2. Sample of countries

Entire sample			
Non-LDCs		LDCs	
Albania	Egypt, Arab Rep.	Morocco	Bangladesh
Algeria	El Salvador	Nicaragua	Benin
Armenia	Fiji	Pakistan	Burkina Faso
Bolivia	Georgia	Panama	Burundi
Bosnia and Herzegovina	Ghana	Peru	Congo, Dem. Rep
Brazil	Guatemala	Philippines	Guinea
Cabo Verde	Honduras	Serbia	Haiti
Cameroon	Indonesia	Thailand	Madagascar
Chile	Jamaica	Tunisia	Mali
China	Jordan	Turkey	Mauritania
Colombia	Kenya	Uruguay	Mozambique
Congo, Rep.	Kyrgyz Republic	Zimbabwe	Nepal
Costa Rica	Malaysia		Niger
Cote d'Ivoire	Mexico		Senegal
Dominican Republic	Moldova		Togo
Ecuador	Mongolia		Zambia

Note(s): The 2022 UN list of least developed countries: <https://unctad.org/topic/least-developed-countries/list>

Source(s): Authors' own work

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