

Gnangnon, Sèna Kimm

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Aid for Trade flows and Poverty Reduction in Recipient-Countries

Sèna Kimm GNANGNON¹

Abstract

The effectiveness of Aid for Trade (AfT) interventions, including with respect to recipient-countries' trade performance has now been well explored in the literature. However, in spite of the voluminous literature on the poverty effect of the total official development aid, the effect of AfT flows on poverty has received little attention on the empirical front. The current article aims to contribute to the policy debate on this matter by investigating the effect of AfT flows on poverty in recipient-countries. In particular, the analysis explores whether this effect translates through countries' level of export product concentration, as the latter can influence income inequality, and hence the transformation of economic growth into poverty reduction in recipient-countries. The empirical analysis, based on 100 AfT recipient-countries has shown that AfT interventions are associated with poverty reduction in countries that diversify their export products, including towards manufacturing products. Additionally, AfT flows dampen the positive poverty effect of income inequality, and lead to greater poverty reduction in countries with a great extent of fiscal redistribution. Finally, the analysis has shown that AfT interventions mitigate the positive poverty effect of import product concentration, and are associated with poverty reduction in countries that either diversify their import products or export products. These results have important policy implications.

Keywords: Aid for Trade; Poverty; Export product diversification; Manufacturing exports; Import product diversification.

Jel classification: F35; O11; O14; O15; I30.

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¹ Economist at the Secretariat of the World Trade Organization (WTO). E-mail for correspondence: kgnangnon@yahoo.fr

1. Introduction

Poverty reduction is at the heart of the international agenda for sustainable development (Agenda 2030²). In light of the importance of development aid (i.e., the official development aid) for sustainable development (as also emphasized in Agenda 2030), a voluminous theoretical and empirical literature has considered the effect of aid flows on poverty in recipient-countries (e.g., Masud and Yontcheva, 2005; Collier and Dollar, 2002; Chong et al., 2009; Page and Shimeles, 2015; Kraay and Raddatz, 2007; Moreira and Bayraktar, 2008; De Matteis, 2013; Buffie and Atolia, 2012). These studies³ have not reached a clear-cut conclusion as to whether development aid reduces or increases poverty in recipient-countries. For example, Chong et al. (2009) have reported no significant effect of development aid on poverty. Similarly, Page and Shimeles (2015) have noted that in the post-2015 period, African's fastest growing economies have not experienced higher employment and poverty because development aid in Africa has been provided to countries with a low employment intensity of growth. The authors, have therefore, proposed a new approach to aid and poverty in Africa, that focuses on supporting structural change for job creation. In the same vein, Bourguignon and Platteau (2017) have investigated how aid supply influences the way in which a donor agency allocates the available money between countries that differ in terms of both needs and domestic governance. They have concluded that a donor's utility function that encompasses the need-governance trade-off and the associated optimization mechanism, yields a meaningful rule to guide inter-country allocation of aid resources. Meanwhile, a poverty reduction effect of development aid has been reported by other studies such as Collier and Dollar (2002), Masud and Yontcheva (2005), Kraay and Raddatz (2007), and De Matteis (2013). However, this literature has paid little attention to the specific effect of Aid for Trade (AfT) flows (versus the Non-AfT flows) on poverty reduction. The importance attached by the international community to the effectiveness of AfT flows arises from the realization by the Members of the World Trade Organization (WTO) that developing countries, and least developed countries (LDCs) among them face structural constraints and weak capacities that undermine their capacity to produce, compete and fully benefit from emerging trade and investment opportunities (OECD, 2009). To help them address these constraints, and in line with the preamble⁴ of the agreement establishing the WTO, which has explicitly accorded a priority on "raising standards of living" and on "sustainable development" among the objectives of the WTO, WTO Members launched the AfT Initiative at the 2005 WTO Hong Kong Ministerial Conference. The purpose of this Initiative is to "help developing countries, particularly LDCs build the supply-side capacity and trade-related infrastructure that they need to assist them to implement and benefit from WTO Agreements and more broadly to expand their trade" (see Paragraph 57 of the Hong Kong Ministerial Declaration, see WTO, 2005). While there are now many studies on the effectiveness of AfT flows in terms of recipient-countries' economic performance⁵, including export performance, to the best of our knowledge, none has explored empirically the effect of AfT flows on poverty in recipient-

² The Agenda 2030 is contained in the document titled "Transforming our world: the 2030 Agenda for Sustainable Development", with the United Nations' reference number being A/RES/70/1.

³ For a literature survey on the effectiveness of development with respect to poverty reduction, see Feeny and McGillivray (2017), Guillaumont and Wagner (2014), and Mahembe and Odhiambo (2019).

⁴ See information online at:

https://www.wto.org/english/res_e/publications_e/ai17_e/wto_agree_preamble_jur.pdf

⁵ For a literature review on the AfT effectiveness in recipient-countries, see Cadot et al. (2014), Ngangnon (2020), and OECD-WTO (2017).

countries. Nevertheless, discussions based on case stories and on information collected on the ground have taken place on the poverty effect AfT interventions. The Global Review of Aid for Trade⁶ is a good example in that regard. It is organized by the WTO every two years since the launch of the AfT Initiative, and provides a forum for discussing the effectiveness of AfT interventions in recipient-countries. The OECD/WTO (2017) report prepared in the context of the 2017 Global Review of Aid for Trade has devoted one of its chapters (Chapter 12) to the analysis - through concrete examples on the ground - of the impact of AfT interventions on poverty, and highlighted the role of digital connectivity in that regard. Furthermore, activities under the AfT Initiative are conducted at the WTO, on the basis of a biennial work programme, which aims to promote deeper coherence among AfT partners, as well as an on-going focus on AfT among the trade and development community, with a view to emphasizing concrete results⁷. Interestingly, the theme of the AfT work programme for 2018-2019 was “*Supporting Economic Diversification and Empowerment for Inclusive, Sustainable Development through Aid for Trade*”, and particularly focused on the elimination of extreme poverty, notably through the effective participation of women and young people.

Some reasons underlying lack of empirical analyses on the effect of AfT interventions on poverty have been provided. Cadot et al. (2014) have pointed out that the high costs associated with the impact evaluations of the causal linkages between AfT interventions and poverty make it difficult to undertake such assessments. In the same vein, Cadot and Newfarmer (2011) have noted that the genuine assessment of the effectiveness of AfT flows requires multiple approaches (“a prism of evaluation approaches”), which include case studies, aggregate cross-country assessments, sectoral and programme evaluations, impact assessments, and project evaluations. The current study aims to contribute to the discussion on the poverty effect of AfT interventions by investigating empirically the effect of AfT flows on poverty in recipient-countries, using macroeconomic data.

We postulate that AfT flows can affect poverty in recipient-countries through its effect on export product diversification, as the latter's effect on income inequality could influence the way economic growth (which could itself be affected by export product diversification) is transformed into poverty reduction. The analysis has been conducted using a panel dataset of 100 AfT recipient-countries over the period 2002-2017. The findings indicate that AfT interventions are associated with poverty reduction in countries that diversify their export products, in particular towards manufacturing products. Incidentally, AfT flows help to mitigate the positive poverty effect of income inequality, and additionally exert a greater poverty reduction effect in countries with a great extent of fiscal redistribution. Finally, AfT interventions contribute to mitigating the positive poverty effect of import product concentration, and are associated with poverty reduction in countries that either diversify their export product baskets or their import products baskets.

The rest of the article is organized as follows. Section 2 discusses how AfT interventions can affect poverty through the export product diversification channel. Section 3 presents the

⁶ The Global Review of Aid for Trade was first organized in 2007. It aims to strengthen the monitoring and evaluation of Aid for Trade to provide a strong incentive to both donors and recipients for advancing the Aid for Trade agenda (for further details, see information online at https://www.wto.org/english/tratop_e/devel_e/a4t_e/aid4trade_e.htm)

⁷ For further information on AfT programmes, see online at: https://www.wto.org/english/tratop_e/devel_e/a4t_e/aid4trade_e.htm

baseline model specification that would help conduct the empirical analysis. Section 4 presents the appropriate econometric method to estimate this model, and Section 5 discusses empirical results. Section 6 deepens the analysis concerning the poverty effect of AfT flows through the export product diversification avenue, and Section 7 explores how import product concentration influences the relationship between AfT flows and poverty. Section 8 concludes.

2. Theoretical considerations: discussion on the effect of AfT flows on poverty through export product diversification

The Organization of Economic Cooperation and Development (OECD) has identified three major categories of total AfT flows. These include AfT flows allocated to building economic infrastructure, AfT flows related to building productive capacity, and AfT for trade policy and regulation. The first category of AfT encompasses several sectors, including transport and storage, communications, and energy generation and supply. AfT dedicated to building productive capacity covers the sectors of banking and financial services, business and other services, agriculture, fishing, industry, mineral resources and mining, and tourism. AfT interventions for trade policy and regulation include technical assistance for trade-capacity building (for example by the WTO Secretariat) so as to help policymakers in developing be better equipped to negotiate trade agreements, develop trade strategies, and implement WTO Agreements. This category of AfT flows also includes trade-related adjustment flows that aim to help recipient-countries mitigate the adjustment costs related to trade liberalization: these entail dealing with the fall in international trade tax revenue due to greater trade policy liberalization, the erosion of preferences arising from the fall in Most Favoured Nations (MFN) tariffs, and the social dislocation induced by the enhancement of competition associated with greater trade policy liberalization (OECD, 2009). The report by OECD (2009) titled "Trade out of Poverty – How can Aid for Trade Help" has provided a discussion on ways through which AfT interventions can help reduce poverty in developing countries. Among channels highlighted are the improvement of trade performance through the removal of supply-side constraints, the connection of poorest segments of the populations to markets, and the mitigation of adjustment costs induced by trade policy liberalization. Alonso (2016) has noted that AfT flows can affect poverty through its positive effect on trade expansion (including export diversification) and hence on economic growth. He has nevertheless pointed out that greater trade openness might be associated with higher income inequality and gender inequality.

In the present analysis, we postulate that AfT flows can affect poverty through the export product diversification channel. The export product diversification effect of AfT flows has been the subject of few empirical works. Gnanngnon (2019a) has shown that total AfT flows induce greater export product diversification, including through trade costs reduction thanks particularly to the AfT components related to economic infrastructure and to trade policy and regulation (e.g., Anderson and Marcouiller, 2002; Busse et al., 2012; Hoekman and Nicita, 2010; Limao and Venables, 2001; Portugal-Perez and Wilson, 2012; Wilson et al., 2003, 2005). Additionally, AfT for building economic infrastructure helps develop information and communication technology (ICT) tools in developing countries. The OECD/WTO report on the AfT at a glance 2017 (OECD/WTO, 2017: Chapter 12) has provided a detailed analysis on the role of AfT for trade in promoting digital connectivity. Gnanngnon (2019b) has also shown that AfT for ICT development

has helped to reduce the global digital divide (notably related to the Internet) experienced by recipient-countries. This can, in turn, contribute to promoting export product diversification: Lapatinas (2019) has reported the positive export sophistication effect of the greater access to the Internet. The positive export product diversification effect of AfT flows also takes place through the positive influence of AfT interventions for building productive capacity in recipient-countries. In another study, Gnanngnon (2019c) has found that total AfT flows promote export product diversification in countries with, *inter alia*, greater trade policy liberalisation, greater financial openness, and better institutional and governance quality. Kim (2019) has uncovered that, total AfT flows generate greater export product diversification in the short run, while in the long-term, it is only AfT for productive capacity building that enhances export product diversification. The author has then explained these findings by the redistribution of shares of existing products of a similar sophistication level, rather than by an increase in export diversity. Other closely related studies include that of Hühne et al. (2014a) who have reported that AfT has been effective in promoting exports of manufactures in recipient-countries, but has exerted no significant effect on recipient-countries' primary commodities. Gnanngnon (2018a) has considered the effect of AfT inflows on recipient-countries' export structure, and obtained that AfT inflows have been positively associated with exports of low-skill and technology-intensive manufactures, and high-skill and technology-intensive manufactures, but not medium-skill and technology-intensive manufactures. Specially for LDCs, the author has reported that AfT flows have helped promote low-skill and technology-intensive manufactures, but have been negatively associated with medium-skill and technology-intensive manufactures as well as high-skill and technology-intensive manufactures.

Let us now discuss how AfT flows can affect poverty particularly through the export product diversification channel. These could particularly take place through the effect of export product diversification income inequality (and economic growth), in light of the growth-inequality-poverty nexus (see for example, Thorbecke, 2013 for a literature review on the growth-inequality-poverty nexus). Concerning the effect on economic growth, since the seminal works of Rosenstein-Rodan (1943), Prebisch (1950) and Singer (1950), a voluminous theoretical and empirical work has demonstrated that countries with a diversified and sophisticated productive structure are those that achieve higher levels of economic development⁸. At the same time, the empirical analyses on the economic growth effect of export product diversification have revealed mixed conclusions. While some studies (e.g., Can and Gozgor, 2017; De Pineres and Ferrantino, 1997; Herzer and Nowak-Lehmann, 2006) have reported a positive (linear) effect of export product diversification on economic growth, others (e.g., Hess, 2008; Aditya and Acharyya, 2013) have demonstrated the existence of a nonlinear effect of export product diversification on economic growth, whereby developing countries enjoy a positive effect of export product diversification on economic growth, while advanced economies experience an enhancing economic growth effect of export specialization (see also Hausmann et al., 2007). Mania and Rieber (2019) have obtained heterogenous effects of product export diversification on sustainable economic growth across three sub-sets of developing countries (i.e., Latin America, sub-Saharan Africa and developing Asia). Other studies (e.g., Hidalgo and Hausmann, 2009; Felipe et al., 2012; Constantine, 2019;

⁸ See for example, Constantine (2017); Frenken et al. (2007); Hidalgo and Hausmann (2009); Hausmann et al. (2014); Hidalgo et al. (2007); Hirschman (1958); Imbs and Wacziarg (2003); Saviotti and Pyka (2004); Saviotti and Frenken (2008); and Pinheiro et al. (2018).

Cristelli et al., 2013; Hausmann et al., 2014; Pinheiro et al., 2018) have provided strong empirical evidence that countries producers and exporters of simple or resource-based products in the periphery of the product space⁹ experience a far lower real per capita income and lower future economic growth prospects than do countries exporters of complex¹⁰ products.

As for the effect of export diversification on income inequality, it has been pointed out that countries that are dependent on primary products encounter difficulties of moving into unrelated and complex products (e.g., Hartmann et al., 2019b; Pinheiro et al., 2018) and experience higher income and wealth inequality (e.g., Innis, 1970; Haber, 1997; Acemoglu and Robinson, 2012). Hartmann et al. (2016, 2017) have used recent methods from network science and economic complexity to assess the level of income inequality associated with economic complexity, that is, for example, different types of goods such as crude petroleum, coffee beans or machines. The argument underlying of the association between economic complexity and income inequality is that productive structures of a given country reflect a high-resolution expression of a number of factors specific to this country (e.g., factor endowments, geography, institutions, historical trajectories, changes in technology, returns on capitals, education) which co-evolve with the mix of products that a country exports and with the inclusiveness of its economy. Thus, countries with diversified and complex productive structures are likely those that enjoy more inclusive institutions, better educated citizen, well paid and empowered workers (e.g., Acemoglu and Robinson 2012; Engerman and Sokoloff, 1997; Gala et al., 2018; Hartmann, 2014; Hartmann et al., 2017; Hidalgo 2015), a wider range of job opportunities for workers who tend to strengthen their bargaining power through the formation of more efficient unions (e.g., Hartmann et al., 2019) and a better distribution of political and economic power, i.e., lower levels of rent-seeking and political capture of economic benefits (e.g., Collier, 2007; Hartmann et al., 2017). Specially, Hartmann et al. (2017) have defined the Product Gini Index (PGI) as proxies for the level of income inequality associated with different 775 different types of export goods. The PGI is the average level of income inequality of a product's exporters, weighted by the importance of each product in a country's export basket. They have shown empirically that exporting complex products is associated with a greater inclusiveness and lower levels of income inequality than exporting simpler products. In particular, they have uncovered that simple agricultural products (e.g., cocoa beans or cotton, as well as mining products, such as copper, zinc or nickel) are associated with high levels of income inequality, while feature more complex products (e.g., knowledge-based activities, such as medicaments, hormones or X-Ray machines, or specialized machinery) are associated with low income inequality. Along the same lines, Hartmann et al. (2019) have relied on the methods from network science and economic complexity to analyse the association between the level of income inequality and trade specializations and flows (i.e., both export and import portfolios) between 116 countries over the period 1970-2015. This exercise has helped them to re-evaluate old theories in economics, such as the core-periphery structure of

⁹ The product space is a network that estimates the relatedness/closeness of hundreds of different export products, i.e., the shared productive capabilities required to produce two different trade products based on the conditional probability that two products are co-exported (Hartmann et al. 2019; Hausmann et al., 2014; Hidalgo et al., 2007).

¹⁰ A country is defined as complex if it exports not only a large number of different products but also highly complex products (e.g., Hartmann et al., 2017; Hartmann, 2019a, 2019b; Hausmann et al., 2014; Hidalgo and Hausmann, 2009; Hidalgo et al., 2007). It reflects the knowledge intensity of the materialized in a its productive structure.

income inequality associated with global trade or structural development traps. Among other results, the authors have obtained that the core-periphery structure of global trade affects both the income inequality between countries and the income inequality within countries. Developing economies tend to mainly export high inequality products to the world, while in contrast, highly developed countries mainly export products with a low PGI to both developing and developed economies. At least, these confirm the findings by Hartmann et al. (2017) that developing countries likely experience a higher income inequality because of their dependence on exports of simpler or resource-based products.

Another strand of the macro-international trade literature (although few studies) has focused on the effect of export product diversification on inequality. Export product diversification can result in lower income inequality if it is associated with more employment opportunities for both skilled, low-skilled, and unskilled workers (e.g., Albassam, 2015; Le et al., 2020). Export diversification (as a result of economic diversification) can make firms more efficient, while ensuring their long-term viability in the course of trade liberalization (e.g., Barnes et al., 2015), and hence allow for the employability of workers at all levels (Le et al., 2020). It is worth noting here that UNCTAD (2018) has reported a positive effect of export product diversification on employment in developing countries, although the magnitude of this positive effect is lower for African countries than for other countries. Similarly, Gngangnon (2019d) has obtained a positive effect of AfT flows on employment in developing countries, and Gngangnon (2018b) has uncovered a positive employment diversification effect (across various economic sectors) of AfT flows. Additionally, the view that export product diversification would always lead to higher employment, needs to be nuanced. For example, using data for Brazil, China, India and South Africa over the period 1962-2000, Naude and Rossouw (2011) have illustrated that export product diversification promotes employment only in South Africa, as in the other countries, it is rather export concentration that is positively associated with employment. On another note, the income inequality effect of export product diversification might also depend on the extent to which export product diversification affects the skill premiums, i.e., the extent to which it raises wages of skilled workers relatively to the wages of unskilled workers. This can be particularly relevant in the presence of technological and institutional changes (e.g., Agénor, and Aizenman, 1997; Antonelli and Scellato, 2019; Krugman and Lawrence, 1993; Krugman 1994; Lee and Wie, 2015; Meschi and Vivarelli, 2009; Pi and Zhang, 2018). In the meantime, it is also possible that export product diversification, in particular at the initial stage, be associated with higher income inequality (Le et al. 2020) due to the unreasonably high fixed and sunk costs of production activities experienced by firms, including smaller ones when they seek to introduce a new product in the market or entry into a new market (e.g., Aw and Lee, 2017; Fillat et al. 2015; Hoffman et al., 2016; Impullitti et al., 2013; Klinger and Lederman, 2011; Vannoorenberghe et al. 2016). These have led Le et al. (2020) to postulate an inverted-U shaped relationship between export diversification and income inequality, based on the argument that at the initial stages of export diversification, the related costs might be higher than the benefits, and the demand for skilled labour by firms (Anderson, 2005) might increase so as to improve productivity and efficiency (e.g., Anderson, 2005). These structural changes would lead to higher income inequality due to the skill-biased nature of new sectors and/or technologies. Le et al. (2020) have used a set of 90 countries of different income levels, over the 2002-2014, to report empirical evidence of a non-linear relationship (i.e., inverted-U shaped) between export product diversification and income inequality. Among other few

existing studies on the effect of export product diversification on income inequality are Blancheton and Chhorn (2018), who based on panel of 52 Asian and Western countries over the period 1988-2014, have found that sectoral export diversification induces higher income inequality, while manufacturing specialization does not influence income inequality. In particular, greater manufacturing specialization reduces income inequality in high-income Asian countries and European Union (EU), while manufacturing specialization does not affect income inequality in low-income Asian countries and Anglo-Saxon countries. Similarly, Gnangnon (2019e) has reported, *inter alia*, that export product diversification reduces inequality in developing countries. Very few other studies on the effect of export product structure on income inequality are also closed in spirit to the previous ones. For example, Zhu and He (2020) have used China's export and income survey data to provide empirically that export upgrading only contributes to lowering income inequality in China's urban areas. More complex export product/destination structures are rather associated with a rise in urban-rural inequality, because of the concentration of export activities in urban areas and the existence of some barriers that limit the flow of input factors (e.g. capital and labor) between rural and urban areas.

Against this background, we could expect that greater export product diversification in developing countries would be associated with a higher economic growth and a lower level of income inequality. In the meantime, the existence of the economic-growth-inequality-poverty nexus is grounded on the fact that inequality can play a crucial role in the process of transformation of growth into poverty reduction (e.g., Adams, 2004 ; Bourguignon, 2003 ; Easterly, 2000 ; Epaulard, 2003; Fosu, 2009, 2017; Kalwij and Verschoor, 2007; Ravallion, 1997). For example, recently, Fosu (2017) has shown that while growth has been the major driver of falling or increasing poverty, inequality has also played a critical role in poverty behavior in a large number of countries. Thus, taking together the literature review on the effect of export product diversification on economic growth and income inequality on the one hand, and the literature on economic-growth-inequality-poverty nexus on the other hand, we hypothesize that the poverty effect of export product diversification ultimately depends on how it affects income inequality. ***Coming now to our issue of key interest in the analysis, we can argue that the ultimate effect of AfT flows on poverty through export product diversification would depend on the extent to which the latter affects the nexus economic growth-income inequality-poverty.*** To recall, the main objective of the present study is to test how AfT flows affect poverty, notably through the export product diversification and particularly the income inequality channel, as the latter is expected to affect the way economic growth (which can itself result from export product diversification) is transformed into poverty.

There are other factors (than income inequality) – although not explicitly tested in the present analysis - that play an important role on the manner through which AfT flows affect poverty via the export product diversification channel. On the one hand, export product diversification can also result in poverty reduction through its effects on countries' vulnerability to shocks and output/exports volatility. Export product diversification, including towards manufactured products can help dampen countries' vulnerability to shocks by reducing and even

stabilizing export earnings fluctuations¹¹, lowering aggregate output volatility¹², and mitigating the volatility of firms' output/exports¹³. On the other hand, many empirical works have demonstrated the adverse poverty effects of negative external shocks in developing countries. For example, macroeconomic volatility (for example, output volatility and terms of trade fluctuations) adversely affects growth and business cycles in developing countries¹⁴ as well as welfare (e.g., Acemoglu et al. 2003; Dabla-Norris and Gündüz, 2014; Hnatkovska and Loayza, 2005). Incidentally, the rising poverty effects of financial crises in developing countries (for example through lower income, economic downturns and higher unemployment rates) have been reported by Dollar and Kraay (2002), Chen and Ravallion (2009) and Rewilak (2018). According to Gerry et al. (2014), negative income shocks due to crises and higher food prices induce a decline in nutritional levels and health of poor people, and ultimately results in higher mortality rates. The negative social consequences of terms of trade shocks (for example in terms of higher poverty rates and deterioration of human development) have been pointed out by Bredenkamp and Bersch (2012) and Nkurunziza et al. (2017), among others. Ivanic and Martin (2008) have demonstrated empirically that global food prices shocks (i.e., the large increases in food prices in 2005-2007) have induced a substantial rise in overall poverty in low-income countries. Moncarz et al. (2018) have obtained that shocks to international prices of agricultural commodities have adversely affected welfare and substantially raised poverty. According to Álvarez et al. (2018), positive terms of trade shocks, especially the rise in mineral prices in Chile between 2003 and 2009 have resulted in poverty reduction in the municipalities exposed to this commodity boom, including through higher wages and employment, especially for unskilled workers and workers employed in metal-mining industries. All these show that by reducing countries' vulnerability to negative external shocks, and hence the volatility of output, terms of trade and export revenue, export product diversification can lead to poverty reduction. As a result, AfT flows through its effect on export product diversification could be associated with greater poverty reduction. Another study that is worth mentioning in the context of the present analysis is that of Santos-Paulino (2017). The author has investigated the poverty effect of trade specialization in developing countries, and obtained that manufacturing exports helps reduce poverty, while in low-income countries, agricultural exports have a more significant effect on poverty reduction. These findings clearly suggest that while one might expect export product diversification (including towards manufactured goods) to help reduce poverty in developing countries, one should also not rule out the fact that a positive agricultural exports effects of AfT flows (for example through enhancement of the agricultural productivity – see for example, Irz et al., 2001; Ivanic and Martin, 2018) can contribute to reducing poverty especially in low-income countries.

Summing up the whole discussion, we expect AfT flows to be associated with poverty reduction in countries that diversify their export product basket. However, the direction in which these capital flows affect poverty in recipient-countries still remains an empirical matter as it

¹¹ See for example Athukorola (2000); Bleaney and Greenaway (2001); Ghosh and Ostry (1994); and Stanley and Bunnag (2001).

¹² See for example Bacchetta et al. (2007); Balavac and Pugh (2016); di Giovanni et al. (2014); Joya (2015); Haddad et al. (2013); Malik and Temple (2009) and Neto and Romeu (2011).

¹³ See for example Hirsch and Lev (1971); Juvenal and Monteiro (2013); Kramarz et al. (2020); Maggioni et al. (2016); and Vannoorenberghe et al. (2016).

¹⁴ See for example Ahmed (2003); Alimi and Aflouk (2017); Bacchetta et al. (2009); Barrot et al. (2018); Kose (2002); Raddatz (2007) and Ramey and Ramey (1995).

ultimately depends on how the income inequality level associated with export product diversification influences ways of transformation of economic growth (which may also be associated with to export product diversification) into poverty reduction.

3. Model specification

We conduct the empirical analysis on the effect of AfT flows on poverty by taking cues from previous empirical studies on the macroeconomic determinants of poverty (e.g., Bergh and Nilsson, 2014; Fosu, 2018; Gnangnon, 2019f; Kiendrebeogo and Minea, 2016; Kpodar and Singh, 2011; Lacalle-Calderon et al. 2018; Le Goff and Singh, 2014; Rewilak, 2018; Santos-Paulino, 2017; Singh and Huang, 2015; Zhang and Naceur, 2019).

We consider the following baseline model:

$$POVHC_{it} = \alpha_0 + \alpha_1 POVHC_{it-1} + \alpha_2 AfT_{it} + \alpha_3 NonAfT_{it} + \alpha_4 \text{Log}(GDPC)_{it} + \alpha_5 TP_{it} + \alpha_6 GFCF_{it} + \alpha_7 EDU_{it} + \alpha_8 INST_{it} + \alpha_9 FINDEV_{it} + \alpha_{10} POP_{it} + \mu_i + \vartheta_t + \omega_{it} \quad (1)$$

where i stands for a given country, and t represents the time-period. Model (1) has been estimated using a panel dataset of 100 countries over the period 2002-2017, based on data availability. To mitigate the effect of business cycles on variables, we follow the standard practice in the empirical literature and use non-overlapping sub-periods (here, of 3-year average data). These sub-periods include 2002-2004; 2005-2007; 2008-2010; 2011-2013; and 2014-2017 (note that this last sub-period covers 4 years). α_0 to α_{10} are parameters that need to be estimated. μ_i stand for countries' fixed effects; ϑ_t are time dummies, and capture global shocks that affect together all countries' poverty levels. ω_{it} is an idiosyncratic error-term.

"POVHC" stands for the level of poverty in a given country. It is measured by the headcount index of poverty, which is also widely used in empirical analyses of the macroeconomic determinants of poverty. The headcount poverty ratio represents the absolute poverty, i.e., the percentage of the population living with consumption or income per person below a certain poverty line, in particular, the percentage of the population living on less than \$1.90 a day at 2011 international prices. Following several previous empirical studies, the one-period lag of this variable has been introduced in model (1) so as to account for the mean reversion of the poverty level.

"AfT" represents AfT flows, i.e., the real gross disbursements of AfT flows. It could be either the total real gross disbursements AfT flows (constant US dollar 2016 prices) denoted "AfTTOT" or one its three major categories. The latter include the real gross disbursements AfT flows for economic infrastructure (constant US dollar 2016 prices) denoted "AfTINFRA", the real gross disbursements of AfT flows for building productive capacity (constant US dollar 2016 prices) denoted "AfTPROD", and the real gross disbursements of AfT flows allocated for trade policy and regulation (constant US dollar 2016 prices) denoted "AfTPOL". From now onwards, we use the expression "AfT variables" to refer to both total AfT flows and its three major components.

"NonAfT" is the real total gross disbursements of NonAfT flows (constant US dollar 2016 prices), that is the part of total official development aid not allocated to the trade sector in

developing countries. It represents the difference between the gross disbursements of total ODA and the gross disbursements of total AfT flows (both being expressed in constant prices 2016, US Dollar). NonAfT flows include, *inter alia*, aid related to humanitarian assistance, construction, the accumulation of human capital (i.e., the enhancement of better education and health) and institutional improvement. For example, aid for education and aid for health are associated with higher educational outcomes (e.g., Birchler and Michaelowa, 2016; Dreher et al. 2008) and health outcomes (e.g., Chauvet et al., 2009; Kotsadam et al. 2018; Pickbourn and Ndikumana, 2016). More generally, development aid¹⁵ (which includes both AfT and NonAfT flows) helps mitigate the negative effect of structural economic vulnerability on growth (e.g., Chauvet and Guillaumont, 2009; Guillaumont and Wagner, 2012). Therefore, we expect NonAfT flows to be associated with poverty reduction. However, if NonAfT flows result in an appreciation of the real exchange rate (see for example, Adam, 2005; and Addison and Balamoune-Lutz, 2017 for the discussion on how development can affect the real exchange rate) that hurts the country's export competitiveness, they can lead to higher poverty. Appendix 1 provides the description and source of variables contained in model (1).

To avoid encountering problems related to units of measurement of variables when comparing estimates arising from regressions, we have standardized all variables contained in model (1) before running regressions. The standardization of each variable involves calculating the ratio of the difference between the variable and its mean (average) to the standard deviation of this variable. The standardized coefficients that arise from estimations help assess which variables contribute the most and the least to driving poverty in AfT recipient-countries. Finally, the regressions based on the standardized variables do not contain time dummies, as the standardized values of the latter amount to zero. Appendix 2a presents descriptive statistics on unstandardized variables used in model (1). Appendix 2b shows descriptive statistics on standardized variables used in the model, and Appendix 3 reports the list of the 100 countries used in the analysis.

Concerning the other control variables of model (1), and following previous works on the macroeconomic determinants of poverty, we expect a rise in the real per capita income ("GDPC") (which is here, a proxy for the development level) to lead to greater poverty reduction. As for the effect of trade policy on poverty, the theoretical literature¹⁶ has suggested that trade policy liberalization (or trade openness, which is influenced by trade policy, among other factors) can affect poverty through a variety of avenues, including how further to trade policy liberalization, prices are transmitted from the border down to the household, how trade policy liberalization influences profits, wages and employment; government revenue and pro-poor expenditure, and the riskiness of households' livelihoods (see McCulloch et al., 2001, p. 65). The empirical literature on the poverty effect of trade policy liberalization is mixed as positive, negative and non-significant effects have been obtained. For example, the absence of a significant effect of trade liberalization on poverty has been reported by Dollar and Kraay (2004) and Kpodar and Singh (2011), whereas Singh and Huang (2015) have found a negative poverty effect of trade liberalization. Nicita et al. (2014) have shown for six Sub-Saharan African countries (Burkina Faso, Cameroon, Côte d'Ivoire, Ethiopia, Gambia, and Madagascar) that trade policies tend to be biased in favour of poor households through a redistribution of income from rich to poor households. Bergh and Nilsson

¹⁵ Guillaumont and Wagner (2014) have provided a comprehensive literature review on AfT effectiveness.

¹⁶ McCulloch et al. (2001); Winters et al. (2004); Winters and Martuscelli (2014), and Pavcnik (2014) have provided a detailed theoretical literature on the impact of trade liberalization on poverty.

(2014) and Mahadevan et al. (2017) have, in contrast, uncovered a positive effect of trade liberalization on poverty.

Following the empirical literature on the macroeconomic determinants of poverty, we expect human capital development (proxied here by the education level) to help reduce poverty if higher education translates into the improvement of people's living conditions (for example through getting better jobs and higher earnings). However, if a higher education level does not allow people to improve their living conditions because of the lack of jobs opportunities in the labour market or because they cannot obtain a financial support either from the government or from the financial system to develop their own income-generating activities (e.g., entrepreneurship), then it might be associated with a higher poverty level (see for example Zhang, 2014 on this point, as well as Cremin and Nakabugo, 2012 who have discussed the conditions under which education contributes to reducing poverty).

A rise in the depth of financial development ("FINDEV") – in the context of good institutional setting - can help address the existing information asymmetries in the markets by providing poor households with a better access to credit, helping them to manage their risks through access to cheaper financial instruments or financing the expansion of more firms that would use their skills (e.g., Kpodar and Singh, 2011). Singh and Huang (2015) have shown that without stronger property rights, financial deepening could widen income inequality and induce higher poverty levels. Beck et al. (2007), Kiendrebeogo and Minea (2016) and Rewilak (2017) have reported a poverty reduction effect of greater financial development. However, according for example to Akhter and Daly (2009) and Guillaumont Jeanneney and Kpodar (2011), financial development can lead to higher poverty rates if it is associated with greater financial instability. Incidentally, improvements in institutional and governance quality ("INST") can contribute to reducing poverty (e.g., Perera and Lee, 2013; Singh and Huang, 2015). Studies such as Agénor et al. (2008) have also emphasized the role of public investment in helping to reduce poverty. Finally, the population size variable ("POP"), which captures countries' size, has been introduced in model (1) so as to take into account its effect on poverty (e.g., Kibirige, 1997; Martín-Guzmán, 2005). The importance of this variable lies on the fact that it genuinely affects the way development aid is allocated (e.g., Alesina and Dollar, 2000; Bandyopadhyay and Wall, 2007; Neumayer, 2003; Trumbull and Wall, 1994; Younas, 2008) and in particular the way AfT flows are allocated across recipient-countries by donors (e.g., Gnangnon, 2016; 2017; 2018c; Lee, 2015).

Before turning to the discussion of the empirical approach used to estimate model (1) and its different variants, we find useful to provide some graphical insights on the correlation between total AfT flows and poverty. Using the panel of 100 countries over the five non-overlapping sub-periods, and the average of the non-standardized "AfTTOT" and "POVHC", Figure 1 shows the development of both total AfT flows and the poverty headcount ratio, and Figure 2 displays the correlation pattern between these two indicators. We observe in Figure 1 that total AfT flows and the poverty rate have moved in opposite directions. In particular, the total AfT flows have increased steadily over the entire period, from US\$ 108 millions in 2002-2004 to US\$ 300 millions in 2014-2017. At the same time, the poverty headcount ratio has progressively declined from 26.6 2002-2004 to 17.9 2014-2017. Figure 2 indicates a positive correlation between total AfT flows and the poverty indicator.

4. Econometric strategy

Model (1) is plagued with many endogeneity concerns, including the correlation¹⁷ between the one-period lagged dependent variable and countries' specific effects, and the reverse causality problem arising from the potential 'reverse' causation from the poverty variable to each of the regressors in model (1), except for the population size variable. In this light, and following many previous empirical studies on the macroeconomic determinants of poverty, we estimate model (1) and all its variants described below by means of the two-step system Generalized Methods of Moments (GMM) approach proposed by Arellano and Bover (1995) and Blundell and Bond (1998). This estimator helps handle the endogeneity concerns raised above, and to that effect, allows estimating of an equation in differences and an equation in levels where respectively lagged first differences are used as instruments for the levels equation and lagged levels are used as instruments for the first-difference equation. The consistency of this estimator is assessed by means of three tests, including the Arellano-Bond (AB) test of presence of first-order serial correlation in the error term (denoted AR(1)), the Arellano-Bond (AB) test of no second-order autocorrelation in the residuals (denoted AR(2)), and the Sargan/Hansen test of over-identifying restrictions (OID). Thus, for the estimator to be consistent at the 10% level of confidence, the null hypotheses of these tests should not be rejected, and the p-value associated with the OID test should be higher than 0.01. While the use of the two-step system GMM estimator provides researchers with some freedom in choosing the appropriate lag structure for the instruments used in the regressions (i.e., from the second or third lag of the instrumented variables up to the n^{th} lag, $n \geq 2$), it is also equally important that the number of instruments used in the regressions should not be higher than the number of countries. Otherwise, estimates obtained would be biased, and the afore-mentioned diagnostic tests may lose power (e.g., Bowsher, 2002; Roodman, 2009). To meet these requirements, all regressors except for the population size variable have been considered as endogenous, and we use in the regressions a maximum of 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments.

Against this background, the empirical exercise is conducted as follows. Table 1 reports the results of the estimation of several specifications of model (1), including with each of the AfT variables. Results in Table 2 help address the question as to whether the effect of AfT flows on poverty depends on the recipient-countries' level of export product concentration (or diversification). To address this question, we estimate several specifications of model (1) that include both an indicator of export product concentration, and the interaction between this indicator and each AfT variable. Two indicators of export product concentration are used, both being extracted from the database of the United Nations Conference on Trade and Development (UNCTAD) (see Appendix 1 for further details). The first indicator is the Herfindahl-Hirschman index of export product concentration (denoted "ECI") whose values range between 0 and 1, with lower values showing a greater extent of export product diversification (and higher values reflecting greater export product concentration). The second indicator is termed 'export product diversification index' (denoted "FKEDI"). It has been computed using the modified measure of similarity in trade proposed by Finger-Kreinin (1979). It reflects the absolute deviation of a country's export structure from world's export product structure. Its values also range between 0

¹⁷ This correlation generates the Nickell bias - see Nickell, 2011- in the context of panel dataset of small time-period and large number of individuals.

and 1, with lower values reflecting a convergence of the country's export product structure towards the world's export product structure (i.e., the concerned country is becoming more competitive in the world market). Higher values of this index indicate a divergence of the country's export product structure from the world's export product structure. Columns [1] to [4] of Table 2 concern the outcomes associated with the use of "ECI", while Columns [5] to [8] of the same Table contain results associated with the use of "FKEDI". It is worth noting that both indicators of export concentration and their interaction with the AfT variables are considered as endogenous in the regressions.

In Table 3, we report the estimation's outcomes that allow examining the extent to which the effect of AfT interventions on poverty depends on countries' share of manufacturing exports in total export products. To that end, we estimate various specifications of model (1) in which we introduce both a variable measuring the share of manufacturing exports in total export products (denoted "SHMAN") and its interaction with each of the AfT variables. Outcomes presented in Table 4 allow assessing the extent to which AfT flows affect poverty in countries that diversify their export products basket notably towards manufacturing products. To perform this analysis, we estimate other variants of model (1) that contain several interaction variables, that is, between the relevant AfT variable, "ECI" and "SHMAN". Thus, for assessing whether the effect of each AfT variable depends on both the level of export product concentration and the share of manufacturing exports in their total export products, we introduce four interaction variables in the model. These include the interaction between the relevant AfT variable and "ECI", the relevant AfT variable and "SHMAN", "ECI" and "SHMAN", and finally the interaction between the relevant AfT variable, "ECI" and "SHMAN".

5. Empirical results

Results that allow assessing the consistency of the two-step system GMM estimator are provided at the bottom of all columns of Tables 1 to 4. They indicate that the nil hypotheses are always rejected, and the p-value related to the OID test is always higher than 0.10. Furthermore, the poverty headcount indicator displays a strong persistence over time. This is exemplified by the positive and significant coefficient at the 1% level of the one-period lag of the dependent variable, and thus confirms the need for considering the dynamic specification of model (1), (i.e., with the one-period lag of the dependent variable as a regressor) in the analysis. Taking up estimates presented in Table 1, we observe in column [1] that the coefficient of "AfTTOT" is positive and significant at the 5% level. In column [2] of Table 1, we note that at the 10% level, AfT for economic infrastructure leads to a higher poverty rate: it is also likely that this result reflect the fact that the effect of this category of AfT flows depends on some recipient-countries' characteristics such as their degree of export product concentration (or diversification). These findings suggest that an increase in the amount of total AfT or AfT for economic infrastructure induces a rise in the poverty rate. They likely hide the fact that the effect of total AfT flows on poverty depends on some features of the recipient-countries such as their level of export product diversification. We will check this later. At the conventional levels, there is no significant effect of AfT for building productive capacity on poverty (see results in column [3] of Table 1). Finally, the estimates presented in column [4] of Table 1 indicate a negative and significant coefficient (at the 1% level) of the variable "AfTPOL". This shows that higher Aid flows for trade policy and regulation lead

to lower poverty in recipient-countries. This result certainly reflects the strong contribution of AfT policy and regulation to mitigating the adjustment strains associated with greater trade policy liberalization. Results related to control variables are, with few exceptions, largely similar across the four columns of Table 1. Focusing on those in column [1] of Table 1, we find that the drivers of poverty reduction include higher NonAfT flows, higher real per capita income, greater trade policy liberalization, and a rise in the population size (the coefficients of all these variables are all significant at the 1% level). However, the rise in the education level appears to be positively associated with poverty, which may signify that some other conditions such as availability of jobs opportunities for educated citizen are critical for the improvement in the education level to result in lower poverty in developing countries. While the institutional and governance quality does not affect influence poverty at the conventional levels, greater financial development appears to be positively associated with poverty, which may indicate that in the context of an increase in the financial development depth, poor people do not benefit from access to credit when institutions are under-developed. Among all regressors, the level of public investment appears to be the most important contributor to the evolution of poverty rates in AfT recipient-countries. This variable is then followed by the population size, the real per capita income, the level of trade policy liberalization, the depth of financial development, the level of education, NonAfT flows, and finally AfT flows (note that the absolute value of the magnitude of the effect of AfT flows is slightly lower than that of NonAfT flows). These, therefore, mean that AfT flows (and NonAfT flows) are the least contributors to the evolution of poverty rates in recipient-countries. However, as noted above, the impact of AfT flows on poverty might be dependent on other factors such as the level of export product diversification, and this can change the rank of this variable – compared to others - in terms of contribution to explaining the level of poverty in recipient-countries.

We now turn to estimations' results presented in Table 2. We note in column [1] that at the conventional levels, the coefficient of "AfTTOT" is non-statistically significant, while the interaction variable with "ECI" show a positive and significant coefficient at the 1% level. These suggest that total AfT flows lead to a greater poverty reduction in countries that experience a higher degree of export product diversification, and the higher the degree of export product diversification, the larger is the magnitude of the negative poverty effect of total AfT flows. Similar findings have been obtained for AfT flows for productive capacity and AfT flows for trade policy and regulation (see columns [3] and [4]), as both lead to poverty reduction in countries that diversify their export products, with the magnitude of these negative poverty effects increasing as the level of export product diversification rises. However, for AfT flows for economic infrastructure, we note that the coefficient of "AfTINFRA" is not statistically significant at the conventional levels, but its interaction with "ECI" holds a negative and significant coefficient (at the 1% level). This indicates that in contrast with the two other components of total AfT flows, AfT interventions for economic infrastructure lead to lower poverty rates in countries that experience a high level of export product concentration. It is worth emphasizing that among the three components of total AfT flows, AfT interventions for trade policy and regulation appear to be the one that exert the highest magnitude of negative effect on poverty as countries further diversify their export products basket. Turning now to estimates concerning the effect of AfT flows on poverty for varying levels of "FKEDI" (see columns [5] to [8]), we note from columns [5] to [7] that the coefficients of AfT variables are not statistically significant at the conventional levels, whereas the coefficients of the related interaction variables are all negative and significant

at the 1% level. It therefore follows that total AfT flows, as well as AfT interventions for economic infrastructure, and for productive capacity building lead to poverty reduction in countries whose export products structure converges towards the world's export product structure: the greater the level of this convergence, the higher is the magnitude of the negative poverty effect of total AfT flows as well as AfT interventions for economic infrastructure, and AfT for productive capacity building. Estimates reported in column [8] of Table 2 show that the coefficient of "AfTPOL" is not statistically significant, while the interaction term of the relevant interaction variable is yet positive, but significant only at the 10% level. We conclude that at the 5% level, there is no significant effect of AfT interventions for trade policy and regulation on poverty for varying countries' degree of similarity between countries' export product structure and the world's export product structure.

Let us now consider results in Table 3. Estimates in column [1] show a positive and significant coefficient for "AfTTOT", and a non-significant coefficient of the interaction variable ["AfTTOT*SHMAN"]. This, therefore, suggests that the effect of total AfT flows on poverty observed in column [1] of Table 1 does not depend on countries' share of manufacturing exports in total export products. However, different outcomes are obtained concerning the components of total AfT flows. While in column [2], the poverty effect of AfT interventions for economic infrastructure does not depend on countries' share of manufacturing exports in total export products, outcomes in columns [3] and [4] show that the effects of both AfT interventions for productive capacity and for trade policy and regulation do depend on countries' share of manufacturing exports in total export products. In fact, in columns [3] and [4], we obtain that "AfTPROD", "AfTPOL", and the interaction terms of the relevant interaction variables (i.e., with "SHMAN") are all negative and significant at the 1% level. These indicate that not only do both AfT interventions for productive capacity and AfT interventions for trade policy and regulation lead to greater poverty reduction in recipient-countries, but the magnitudes of these negative effects rise as countries promote their manufacturing export performance, i.e., as they increase the share of manufacturing exports in total export products.

We now turn to the estimates contained in Table 4. We are particularly interested here in the interaction term related on the one hand to the interaction variable between a given AfT variable, the variable "SHMAN" and the "ECI", and on the other hand, with the interaction term of the interaction between "SHMAN" and "ECI". We note from column [1] of this Table that the coefficient of the interaction variable ["AfTTOT*SHMAN*ECI"] is positive and significant at the 1% level, whereas the interaction term of ["SHMAN*ECI"] is not significant at the conventional levels. Therefore, we conclude that total AfT flows lead to greater poverty reduction in countries that diversify their export products towards manufacturing products: the magnitude of this negative (reducing) poverty effect increases as countries' degree of export product diversification towards manufacturing exports in recipient-countries rises. In column [2] of Table 4, we obtain that the coefficient of the interaction variable ["AfTINFRA*SHMAN*ECI"] is positive and significant at the 1% level, while in contrast, the interaction term of the variable ["SHMAN*ECI"] is negative and significant at the 1% level. On the basis of these two results, we conclude that AfT interventions for economic infrastructure lead to poverty reduction in countries that diversify export products towards manufacturing products, with the magnitude of this negative effect rising as the level of export product diversification towards manufacturing exports increases. As for results in column [3], surprisingly, we obtain no significant interaction terms related respectively

to ["AfTPROD*SHMAN*ECI"] and ["SHMAN*ECI"], which show the absence of significant poverty effect of AfT interventions for productive capacity building in countries that diversify their export product towards manufacturing exports. The lack of statistical significance of these two interaction terms at the conventional levels may be due to the high correlation between the variables "AfTPROD", "SHMAN" and "ECI" (as all of them and their various interactions have been included in the regression). In column [4] of Table 4, we obtain a positive and significant coefficient of ["AfTPOL*SHMAN*ECI"], but a non-statistically significant coefficient of ["SHMAN*ECI"]. Thus, AfT interventions for trade policy and regulation result in greater poverty reduction in countries that diversify export products towards manufacturing products, and the higher the level of export product diversification towards manufacturing products, the greater is the magnitude of the negative effect of this type of AfT interventions on poverty in recipient-countries. Interestingly, the poverty reducing effect of AfT flows for trade policy and regulation is higher than that of AfT flows for economic infrastructure, as countries' level of export product diversification towards manufacturing export rises.

Across Tables 2 to 4, we find that the estimates of control variables are to a large extent, similar to those of Table 1.

6. Further analysis

In light of the importance of income inequality for the relationship between AfT flows and poverty, notably via the export product diversification channel, we deepen the analysis by seeking to address three questions: (i) How do AfT flows affect poverty in countries with high income inequality? In other words, we test whether AfT flows contribute to enhancing or dampening the effect of income inequality on poverty. (ii) How do AfT flows affect poverty in countries that experience higher levels of both export product concentration and income inequality? (iii) To what extent do AfT flows influence poverty in countries that redistribute more through tax and transfers, i.e., countries with a greater extent of fiscal redistribution?

In view of the discussion in Section 2, we can expect on the one hand that AfT flows would help mitigate the positive effect of income inequality on poverty in recipient-countries. The theoretical expectations concerning questions (i) and (iii) seem to be straightforward. Concerning question (ii), we expect AfT flows to lead to higher poverty rates in countries that experience higher income inequality in the context of greater export product concentration. As for the third question, one could argue that a greater extent of fiscal redistribution can help promote export product diversification in countries that receive higher amounts of AfT flows. Thorbecke (2013) has pointed out that while conditional social protections schemes such as the Brazilian Bolsas and the Mexican Progresas and Oportunidades have been successful in reducing inequality in recent years in Brazil and Mexico, there were limited effects of transfers programmes (that usually take the form of workfare programmes such as cash-or-food-for-work and targeted unconditional transfers) to reduce inequality in African economies (see also Krishnan, 2009). Thorbecke (2013) has further noted that conditional programmes can be more effective than unconditional schemes in engendering virtuous circles of pro-poor growth, given their advantages of both reducing poverty and enhancing human capital (e.g., by keeping poor households' children in school) and promoting better health and productivity. These are key ingredients for promoting export product diversification (e.g., Agosin et al., 2012; Hausman et al., 2007; Jetter and Hassan, 2015). Therefore,

we expect that AfT flows could contribute to reducing poverty in countries that provide a greater extent of fiscal redistribution. On another note, AfT interventions allow small and medium-sized enterprises (SMEs) in recipient-countries to overcome the constraints¹⁸ they face in participating in international trade (ITC/WTO, 2014; OECD/WTO, 2015; OECD/WTO, 2019) - and hence promote their competitiveness and export performance in the regional and international markets. As a result, such interventions not only allow the emergence of new SMEs oriented towards international trade activities, but also enhance the capacity of existing trading SMEs to enjoy the benefits of their participation in international trade. Hence, AfT interventions contribute to improving the living conditions of those SMEs, and consequently to poverty reduction in these countries. It therefore follows that in the context of greater fiscal redistribution that can help poorest improve human capital through better education and health, and enhance productivity (e.g., Bigsten, 2018; Jouini et al., 2018; IMF, 2017; Lustig, 2018, Shimeles and Nabassaga, 2018), AfT interventions would lead to greater poverty reduction. This expected joint effect of AfT interventions and fiscal redistribution in leading to greater poverty reduction is exemplified by the findings of Li (2002) concerning the effectiveness of income subsidy programs and programs targeting specifically poor and capable entrepreneurs in promoting entrepreneurial activity and improving total output. Overall, we postulate that AfT flows would contribute to reducing poverty in countries that provide a greater extent of fiscal redistribution.

To address the three questions mentioned above, we estimate different specifications of model (1). The first set of specifications involves introducing in model (1) a variable measuring the level of income inequality along with its interaction with each of the AfT variables. We use the market Gini index (denoted "GINI") that reflects the level of income inequality before taxes and transfers. Its values range between 0 and 100, with higher values reflecting a more unequal income distribution. Results of the estimations of these different variants of model (1) are contained in Table 5. To address empirically question (ii), we estimate another set of variants of model (1) that include four interaction variables (associated with each AfT variable). These are the interaction between the relevant AfT variable and "GINI", between the relevant AfT variable and "ECI", between "ECI" and "GINI", and finally the interaction between the relevant AfT variable, "ECI" and "GINI". Results of these different estimations are displayed in Table 6. Finally, we address question (iii) by estimating several other variants of model (1), which contain both an indicator of the extent of fiscal redistribution (denoted "FISCRE") as well as its interaction with each of the AfT variables. Following previous studies (e.g., Grundler and Kollner, 2017; Berg et al. 2018; Gozgor and Ranjan, 2017; Kammasa and Sarantides, 2019), we measure the extent of fiscal redistribution through taxes and transfers by the difference between the market income Gini (Gini of incomes before tax and transfers) and the net income Gini (Gini of incomes after tax and transfers). As values of these Gini indices range between 0 and 100, it follows that values of the indicator "FISREDIST" also range between 0 and 100, with higher values indicating a greater extent of fiscal redistribution. The results of these estimations are provided in Table 7.

In columns [1] and [3] of Table 5 as well as in all columns of Tables 6 and 7 (see the bottom of these columns), the outcomes of the tests that help assess the consistency of the two-step system GMM estimator are fully satisfactory. However, results of these tests in columns [2] and [4] show

¹⁸ These constraints include among others, the quality of the business environment, the access to finance, and the lack of institutional support to identify and take advantage of market opportunities abroad (ITC/WTO, 2014).

p-values related to AR(2) test amounting to 0.09 in column [2], and 0.05 in column [4], thereby indicating that the estimates contained in columns [2] and [4] are reliable only if we fail to reject the nil hypothesis of this test at the 5% level. Turning now to the interpretation of the estimates reported in Tables 5 to 7, we note that the outcomes of control variables across these three Tables align with those reported in Table 1, particularly in column [1] of this Table. We find in columns [1] to [3] of Table 5 positive coefficients for total AfT flows, AfT flows for economic infrastructure, and AfT flows for productive capacity variables, but negative interaction terms related to the interaction variables between each of these AfT variables and the variable "GINI", all coefficients being statistically significant at the 1% level. We conclude that total AfT flows lead to lower poverty rates in countries that experience a declining level of income inequality, with the magnitude of this reducing poverty effect increasing as the level of income inequality further declines. Another way to interpret the results is that total AfT flows help mitigate the enhancing poverty effect of income inequality, with the size of this mitigating effect rising as the amount of total AfT flows increases. The same interpretation applies to findings related to AfT for economic infrastructure, and AfT for productive capacity building. In the meantime, we observe in columns [4] of Table 5 that both the coefficient of "AfTPOL" and the interaction term associated with the variable "AfTPOL*GINI" are positive and significant at the 5% level. These signify that AfT interventions for trade policy and regulation generate poverty reduction in countries that experience a lower income inequality. This may indicate that countries that receive lower AfT flows for trade policy and regulation (which to recall include resource flows to help mitigate the adjustment costs associated with trade policy liberalization) tend to redistribute more so as to reduce income inequality and hence poverty. In contrast, countries that receive greater amounts of AfT for trade policy and regulation, redistribute less, which leads to higher income inequality, and then higher poverty levels. Results in Table 7 would provide a better insight into how AfT flows affect poverty for varying sizes of fiscal redistribution by governments in recipient-countries.

Taking up outcomes in Table 6, our coefficients of key interest include the interaction between a given AfT variable, "ECI" and "GINI" on the one hand, and the interaction variable capturing the interaction between "ECI" and "GINI" on the other hand. We find from column [1] that the interaction term associated with ["AfTTOT*ECI*GINI"] is not significant at the conventional levels, while the coefficient of ["ECI*GINI"] is statistically significant at the 1% level. These signify that there is no significant effect of total AfT flows on poverty in countries that experience a high level of income inequality in the context of a high degree of export product concentration. Nevertheless, the poverty rate rises in countries that experience a high degree of export product concentration in the context of a rising income inequality level. The same findings are obtained when considering results in column [3] of Table 6, that is, concerning AfT flows for productive capacity. However, results concerning the other two components of total AfT flows reveal different patterns. Specially, we note from column [2] that the interaction terms of the variables ["AfTINFRA*ECI*GINI"] and ["ECI*GINI"] are respectively negative and positive, but both are significant at the 5% level. These suggest that while AfT interventions for building economic infrastructure lead to poverty reduction, the magnitude of this negative effect on poverty decreases as countries' level of income inequality increases in the context of greater export product concentration. The same conclusions apply to AfT interventions related to trade policy and regulation (see results in column [4] of Table 6).

We now examine estimates provided in Table 7. Results in column [1] of this Table indicate a positive and significant coefficient (at the 1% level) of "AfTTOT", and a negative and significant (also at the 1% level) interaction term of the variable ["ECI*FISCRED"]. These show that total AfT flows are associated with greater poverty reduction in countries that have a high extent of fiscal redistribution. This is particularly the case when the size of fiscal redistribution exceeds a certain threshold. This threshold of the index of fiscal redistribution amounts to 5.85 [= $(0.178/0.213)*4.125 + 2.404$], where the figures 0.178 and 0.213 are respectively the estimate of "AfTTOT" and the absolute value of the interaction term associated with the interaction variable ["ECI*FISCRED"]; 4.125 and 2.404 are respectively the standard deviation and the mean of the variable "FISCRED" (see Appendix 2a). Thus, countries that enjoy a size of fiscal redistribution higher than 5.85 experience a poverty reducing effect of total AfT flows, and the magnitude of this negative effect rises as the extent of fiscal redistribution increases. In contrast, in countries with a fiscal redistribution size lower than 5.85, total AfT flows induce a higher poverty rate. These findings clearly reveal that the effect of total AfT flows on poverty in recipient-countries depends on the extent of fiscal redistribution in recipient-countries. Results in column [2] of Table 7 suggest that AfT flows for economic infrastructure induce lower poverty in recipient countries that enjoy a greater extent of fiscal redistribution, but these outcomes are valid only at the 10%. In column [3] of Table 7, the coefficient of "AfTPROD" is not significant at the 10% level, but the coefficient of ["AfTPROD*FISCRED"] is negative and significant at the 1% level. Taken together, these two outcomes suggest that AfT for building productive capacity exerts a negative effect on poverty, with the reducing poverty effect of these capital flows consistently increasing as the extent of fiscal redistribution rises. Finally, according to results in column [4] of Table 7, there is no significant effect of AfT interventions for trade policy and regulation on poverty, including when countries redistribute more through taxes and transfers.

7. Effect of AfT flows on poverty through import product diversification

Thus far, the analysis has focused on how AfT flows affect poverty in recipient-countries through the export product diversification channel. In this section, we consider whether the effect of AfT interventions on poverty also translates through the channel of import product diversification, i.e., the rise in the number of imported varieties. This is because part of AfT flows (in particular of AfT allocated to economic infrastructure and AfT for productive capacity building) could serve to finance the importation of capital goods, as well as other inputs needed in the production process of firms. For example, Hühne et al. (2014b) have uncovered that AfT flows are associated both with a rise in recipient-countries' exports to donors as well as recipient-countries' imports from donors, although the first effect seemed to outweigh the latter one. The benefits of import product diversification for the importing country's economy has been documented in the relevant international trade literature (e.g., Bas, 2012; Bas and Strauss-Kahn, 2014; Broda and Weinstein, 2006; Castellani and Fassinio, 2019; Feng et al. 2016; see Cadot et al. 2011 for a literature review on this matter). As we hypothesize here that AfT interventions would affect poverty through the import product diversification channel, the poverty effect of AfT flows would, therefore, depend on how import product diversification affects poverty. We argue that this could take place through income inequality, employment, productivity, welfare and eventually export product diversification.

The existing literature on the effect of import product diversification on inequality and employment has focused on manufacturing firms in developed countries. Feenstra and Hanson (1996, 1999), Egger and Egger (2003), Hijzen et al. (2005), and Strauss-Kahn (2004) have examined respectively for the United States, Austria, the United Kingdom, and France, how the rise in imported inputs affect the relative demand and/or wage differentials between skilled and unskilled workers. They have obtained that higher imported inputs tend to be associated with higher wages inequality across skill groups, and lower employment. However, it is not clear whether these findings could apply to developing countries. On the other hand, a higher number of imported varieties enhances productivity in the importing country. This particularly takes place through three main channels. First, the importation of a wide range of products, including new products allows domestic producers of close substitute to improve so as to maintain their competitiveness (e.g., Fernandes, 2007; Levinsohn, 1993; Pavcnik, 2002). Second, higher import product diversification allows firms to access to inputs at lower prices, inputs of higher quality, and to a better access to new technologies (e.g., Aghion and Levitt, 1992; Coe et al., 1997; Coe and Helpman, 1985; Ethier, 1982; Keller, 2002; Markusen, 1989; Grossman and Helpman, 1991). At the same time, higher productivity is associated with higher economic growth (e.g., Dumrongritikul et al., 2019; Nakamura et al., 2019) and in light of the possible reducing poverty effect of higher economic growth¹⁹ (e.g., Deininger and Squire, 1998; Dollar and Kraay, 2002; Fosu, 2018; Kraay, 2004; Ravallion, 2001), we can expect import product diversification to ultimately lead to poverty reduction. Furthermore, as noted above, higher productivity growth (including sectoral productivity growth) can result in lower poverty (e.g., CSLS, 2003; Irz et al., 2001; Ivanic and Martin, 2018). On consumers' side, Broda and Weinstein (2006) have found for the United States that greater access to a wider variety of imports has led to a substantial consumer's welfare improvement, that is, by 2.6 per cent. This might also be the case for consumers in developing countries, who thanks to lower import prices associated with access to goods abroad could benefit from welfare improvement, and possibly, poverty reduction. Goldberg et al. (2010) have shown for India that improving firms' access to new input varieties, notably through lower input tariffs, has led to a welfare improvement. Jaimovich (2012) has observed empirically that diversification of imports from different geographical sources promotes economic growth in importing countries. These could ultimately help reduce poverty. Summing up, excluding the case of a possible negative effect of import product diversification on employment and inequality in developing countries (which remains to be tested empirically), we can expect greater import product diversification to reduce poverty: therefore, we may obtain that higher AfT flows would induce lower poverty rates in countries that diversify their import product baskets.

In addition to these possible indirect effects of import product diversification on poverty, it is also possible that import product diversification influences poverty through the export product diversification channel (see the discussion above concerning ways through which export product diversification can affect poverty). In fact, Bas and Strauss-Kahn (2015), Castellani and Fassio (2019) and Feng et al. (2016) have shown that importing a high number of varieties is associated with greater extent of export product diversification. As we have previously obtained that higher AfT flows lead to poverty reduction in the context of greater export product diversification, we

¹⁹ Ferreira et al. (2010) have reported for the case of Brazil that poverty reduction might occur without economic growth, but through a substantial expansion in social security and social assistance transfers.

can be tempted to postulate that AfT flows would exert a greater poverty reduction effect in countries that further diversify their import products. To test the extent to which the effect of AfT flows on poverty depends on the level of import product diversification, we estimate by means of the two-step system GMM approach, several variants of model (1) – that is associated with each AfT variable - in which we introduce an indicator of import product concentration, which is interacted with each of the AfT variables. The indicator of import product concentration is the Herfindahl-Hirschman index of import product concentration (denoted "ICI") (see Appendix 1 for further details on the computation of this index). Values of "ICI" range between 0 and 1, with lower values reflecting greater import product diversification. The outcomes of these estimations are presented in Table 8. The results concerning the desirable properties of the two-step system GMM estimator are fully satisfied (see the outcomes of the diagnostic tests at the bottom of all columns of Table 8). Concerning estimates in this Table, we note from column [1] that while the coefficient of ["AfT*TOT*ICI"] is negative and significant at the 1% level, the estimate associated with "AfT*TOT" is not significant at the conventional levels. In light of these, we conclude that total AfT flows consistently lead to lower poverty rates in countries with a high level of import product concentration, and the poverty reducing effect of these capital inflows increases as the degree of import product concentration rises. Similarly, in columns [2] to [4] of Table 8, we obtain that the three components of total AfT flows are associated with a higher poverty reduction in countries that experience a rising level of import product concentration. It is noteworthy that the poverty reduction effect (as countries experience a higher level of import product concentration) of AfT interventions related to trade policy and regulation is higher than that of the other two components of total AfT flows. These findings contradict our theoretical expectations, and may be interpreted by the fact that AfT flows are used to mitigate the enhancing poverty effect of the rise in the level of import product concentration in recipient-countries, including by serving to diversify export product baskets (as shown by Gnanon, 2019b and Kim, 2019). Thus, import product concentration and export product concentration appear to be substitutable in influencing poverty in AfT recipient-countries (i.e., diversification of export product baskets serves to mitigate the poverty increasing effect of greater import product concentration in these countries), and additionally, AfT flows further reduce poverty as the degree of the substitutability between import product concentration and export product concentration in affecting poverty rises. To check the relevance of our interpretation of these outcomes, we deepen the analysis by investigating how total AfT flows influence poverty in countries that experience both a high degree of export product concentration and a high degree of import product concentration. To that end, we estimate a specification of model (1) in which we include the variable "AfT*TOT" as well as four interaction variables, namely the interaction between "AfT*TOT" and "ECI", the interaction between "AfT*TOT" and "ICI", the interaction between "ECI" and "ICI", and the interaction between "AfT*TOT", "ECI", and "ICI". The outcomes of this estimation are displayed in Table 9. Once again, the desirable properties of the two-step system GMM estimator are satisfied (see the bottom of Table 9). With regard to estimates, the coefficient of ["AfT*TOT*ECI*ICI"] is positive and significant at the 1% level, but the coefficient of ["ECI*ICI"] is negative and significant at the 5% level. Therefore, we deduce that total AfT flows lead to poverty reduction in countries with moderate levels of both import product concentration and export product concentration, as these resource flows result in higher poverty rates in countries with a combined high degree of export product concentration and high level of import product concentration. Another way to interpret

these outcomes is that total AfT flows help reduce poverty in countries that either diversify their import product baskets or their export products baskets, but not in countries that experience a high level of both import and export product concentration.

8. Conclusion

The present article contributes to the literature of effectiveness of development aid with respect to poverty in recipient-countries by investigating how AfT flows affect poverty in these countries. The empirical findings suggest that AfT interventions are effective in reducing poverty in countries that diversify their export products, including towards manufacturing products. AfT flows also contribute to mitigating the enhancing poverty effect of income inequality, and additionally result in greater poverty reduction in countries with a great extent of fiscal redistribution. Finally, AfT interventions help mitigate the positive poverty effect of import product concentration, and are additionally associated with poverty reduction in countries that either diversify imported products or exported products. Countries with a high degree of both import product concentration and export product concentration experience a positive effect of AfT flows on poverty rates.

From a policy perspective, this study highlights not only the critical role of AfT flows in reducing poverty through the export product diversification channel, but also the role of these resource inflows in mitigating the positive poverty effect of income inequality in recipient-countries, as well as in enhancing the poverty reducing effect of fiscal redistribution in recipient-countries. Finally, AfT flows help dampen the poverty enhancing effect of import product concentration. While the discussion is on-going concerning ways for donors to allocate aid across recipient-countries so as to ensure the effectiveness of such aid, it is important to take into account the important role played by AfT flows in achieving poverty reducing through its positive effect on export product diversification. Clearly, AfT flows appear to be critical for poverty reduction, and their scale-up to promote trade expansion in recipient-countries, including through export product diversification can be a targeted objective by both donors and recipients. Future research can involve assessing the poverty effect of AfT interventions by using microeconomic data (i.e., firms level data) and impact evaluation techniques.

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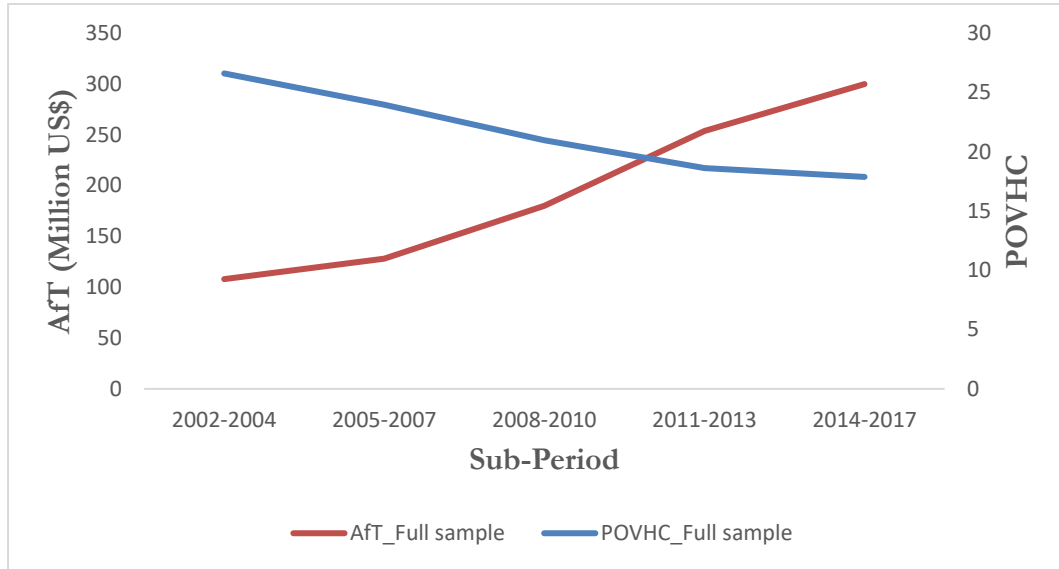
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FIGURES

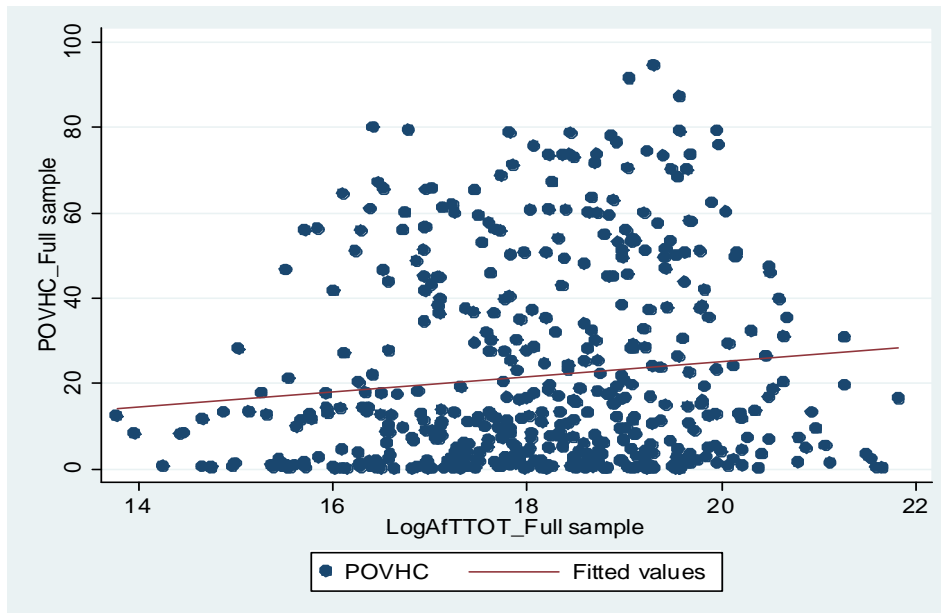
Figure 1: Evolution of total AfT flows and poverty headcount ratio over the full sample



Source: Author

Note: Total Aid for Trade (AfT) is expressed in Million US Dollars, constant 2016 prices.

Figure 2: Correlation pattern between total AfT flows and Poverty headcount ratio



Source: Author

Note: The graph has been plotted using non-standardized (i.e., normal) poverty headcount ratio and total AfT variables. Total Aid for Trade (AfT) is expressed in US Dollars, constant 2016 prices.

Table 1: Effect of AfT flows on poverty
Estimator. Two-step system GMM

Variables	POVHC	POVHC	POVHC	POVHC
	(1)	(2)	(3)	(4)
POVHC _{t-1}	0.349*** (0.0185)	0.361*** (0.0190)	0.366*** (0.0181)	0.362*** (0.0132)
AfT [*] TOT	0.0717** (0.0345)			
AfTINFRA		0.0707* (0.0365)		
AfTPROD			0.0244 (0.0277)	
AfTPOL				-0.0529*** (0.0175)
NonAfT	-0.105*** (0.0297)	-0.0750** (0.0294)	-0.115*** (0.0338)	-0.0156 (0.0182)
GDPC	-0.227*** (0.0394)	-0.210*** (0.0451)	-0.135*** (0.0323)	-0.210*** (0.0226)
TP	-0.227*** (0.0420)	-0.192*** (0.0404)	-0.185*** (0.0399)	-0.0656** (0.0298)
GFCF	-0.313*** (0.0299)	-0.310*** (0.0299)	-0.302*** (0.0284)	-0.218*** (0.0155)
INST	0.00266 (0.0345)	-0.00126 (0.0372)	-0.00602 (0.0356)	0.0196 (0.0140)
EDU	0.109** (0.0481)	0.0619 (0.0399)	0.109** (0.0432)	0.0424** (0.0192)
FINDEV	0.135*** (0.0416)	0.149*** (0.0416)	0.117** (0.0467)	0.0857*** (0.0188)
POP	-0.230*** (0.0245)	-0.232*** (0.0301)	-0.261*** (0.0252)	-0.191*** (0.0209)
Constant	-0.183*** (0.0127)	-0.184*** (0.0141)	-0.203*** (0.0140)	-0.194*** (0.00901)
Observations - Countries	352 - 100	352 - 100	352 - 100	351 - 100
Number of Instruments	75	75	75	83
AR1 (P-Value)	0.0011	0.0013	0.0016	0.0080
AR2 (P-Value)	0.3067	0.1771	0.3913	0.1150
OID (P-Value)	0.1509	0.0996	0.1707	0.1530

Note: AfT variables, and the variables "NonAfT", "GDPC", "TP", "GFCF", "EDU", "INST", and "FINDEV" have been considered as endogenous. The variable "POP" has been considered as exogenous. The regressions have used 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments. All variables have been standardized.

Table 2: Effect of AfT flows on poverty for varying levels of export diversification
Estimator: Two-step system GMM

Variables	<i>Interaction with "ECI"</i>				<i>Interaction with "FKEDI"</i>			
	POVHC	POVHC	POVHC	POVHC	POVHC	POVHC	POVHC	POVHC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POVHC _{t-1}	0.428***	0.384***	0.386***	0.391***	0.374***	0.378***	0.342***	0.341***
	(0.0280)	(0.0115)	(0.0139)	(0.0133)	(0.0137)	(0.0140)	(0.0145)	(0.0133)
AfTTOT	0.0330				0.0265			
	(0.0352)				(0.0188)			
AfTTOT*ECI	0.162***							
	(0.0575)							
AfTINFRA		-0.00575				0.0311		
		(0.0148)				(0.0207)		
AfTINFRA*ECI		-0.0729***						
		(0.0251)						
AfTPROD			0.0347*				0.0218	
			(0.0194)				(0.0179)	
AfTPROD*ECI			0.0873***					
			(0.0197)					
AfTPOL				-0.00522				-0.0206
				(0.0173)				(0.0225)
AfTPOL*ECI				0.114***				
				(0.0218)				
AfTTOT*FKEDI					0.123***			
					(0.0200)			
AfTINFRA*FKEDI						0.130***		
						(0.0240)		
AfTPROD*FKEDI							0.212***	
							(0.0253)	
AfTPOL*FKEDI								0.0408*
								(0.0229)

ECI	-0.00179 (0.0370)	0.0502*** (0.0193)	-0.00139 (0.0172)	0.0168 (0.0189)				
FKEDI					-0.165*** (0.0172)	-0.185*** (0.0193)	-0.157*** (0.0157)	-0.110*** (0.0136)
NonAft	-0.0981** (0.0392)	-0.0429** (0.0193)	-0.0637** (0.0248)	-0.0273** (0.0132)	-0.0713*** (0.0185)	-0.0880*** (0.0192)	-0.0832*** (0.0218)	-0.0247* (0.0133)
GDPC	-0.190*** (0.0663)	-0.158*** (0.0227)	-0.149*** (0.0267)	-0.228*** (0.0225)	-0.238*** (0.0261)	-0.208*** (0.0303)	-0.210*** (0.0241)	-0.234*** (0.0279)
TP	-0.0965** (0.0478)	-0.138*** (0.0286)	-0.0993*** (0.0207)	0.00699 (0.0199)	-0.204*** (0.0221)	-0.201*** (0.0227)	-0.201*** (0.0254)	-0.107*** (0.0248)
GFCF	-0.376*** (0.0330)	-0.273*** (0.0164)	-0.276*** (0.0146)	-0.226*** (0.0142)	-0.298*** (0.0173)	-0.300*** (0.0171)	-0.243*** (0.0179)	-0.243*** (0.0167)
EDU	0.183*** (0.0580)	0.0805*** (0.0245)	0.0201 (0.0252)	0.0709*** (0.0235)	0.148*** (0.0222)	0.154*** (0.0213)	0.0745*** (0.0164)	0.0753*** (0.0182)
INST	0.0810* (0.0469)	0.0321 (0.0266)	-0.0191 (0.0205)	-0.0272 (0.0244)	0.0352 (0.0248)	0.0247 (0.0234)	0.0187 (0.0238)	-0.00181 (0.0191)
FINDEV	-0.0203 (0.0591)	0.115*** (0.0288)	0.166*** (0.0238)	0.120*** (0.0288)	0.0356 (0.0272)	0.0273 (0.0284)	0.0701** (0.0273)	0.0440* (0.0251)
POP	-0.146*** (0.0455)	-0.238*** (0.0198)	-0.251*** (0.0182)	-0.187*** (0.0181)	-0.120*** (0.0252)	-0.117*** (0.0270)	-0.150*** (0.0226)	-0.0950*** (0.0262)
Constant	-0.203*** (0.0233)	-0.196*** (0.0106)	-0.207*** (0.00915)	-0.240*** (0.0104)	-0.202*** (0.00926)	-0.203*** (0.00946)	-0.180*** (0.0116)	-0.206*** (0.0102)
Observations - Countries	352 - 100	352 - 100	352 - 100	351 - 100	352 - 100	352 - 100	352 - 100	351 - 100
Number of Instruments	91	91	91	91	91	91	91	91
AR1 (P-Value)	0.0007	0.0025	0.0040	0.0075	0.0014	0.0010	0.0019	0.0046
AR2 (P-Value)	0.4961	0.1087	0.1223	0.1624	0.5436	0.6018	0.6866	0.3050
OID (P-Value)	0.1136	0.1951	0.2965	0.3545	0.3998	0.3004	0.2513	0.4197

Note: Aft variables, and the variables "ECI", "FKEDI", "NonAft", "GDPC", "TP", "GFCF", "EDU", "INST", and "FINDEV" and the interaction variables have been considered as endogenous. The variable "POP" has been considered as exogenous. The regressions have used 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments. All variables have been standardized.

Table 3: Effect of AfT flows on poverty for varying shares of manufacturing exports in total export products

Estimator. Two-step system GMM

Variables	POVHC	POVHC	POVHC	POVHC
	(1)	(2)	(3)	(4)
POVHC _{t-1}	0.345***	0.362***	0.286***	0.327***
	(0.0122)	(0.0127)	(0.0220)	(0.00927)
AfT*TOT*SHMAN	-0.0336			
	(0.0253)			
AfT*TOT	0.0493**			
	(0.0247)			
AfT*INFRA*SHMAN		-0.0191		
		(0.0239)		
AfT*INFRA		0.0301		
		(0.0193)		
AfT*PROD*SHMAN			-0.288***	
			(0.0346)	
AfT*PROD			-0.113***	
			(0.0222)	
AfT*POL*SHMAN				-0.273***
				(0.0246)
AfT*POL				-0.0548***
				(0.0186)
SHMAN	0.121***	0.109***	0.178***	0.149***
	(0.0176)	(0.0152)	(0.0166)	(0.0184)
NonAfT	-0.141***	-0.125***	-0.0952***	-0.0479**
	(0.0226)	(0.0219)	(0.0153)	(0.0225)
GDPC	-0.228***	-0.193***	-0.119***	-0.202***
	(0.0233)	(0.0222)	(0.0426)	(0.0219)
TP	-0.211***	-0.199***	-0.134***	-0.0550*
	(0.0285)	(0.0268)	(0.0251)	(0.0290)
GFCF	-0.314***	-0.307***	-0.337***	-0.248***
	(0.0153)	(0.0152)	(0.00990)	(0.0132)
EDU	0.131***	0.109***	0.0759***	0.0604***
	(0.0261)	(0.0231)	(0.0248)	(0.0222)
INST	0.00353	-0.00712	-0.0762***	0.0331*
	(0.0183)	(0.0209)	(0.0253)	(0.0175)
FINDEV	0.0957***	0.132***	0.196***	0.0980***
	(0.0245)	(0.0217)	(0.0277)	(0.0218)
POP	-0.178***	-0.196***	-0.327***	-0.216***
	(0.0177)	(0.0174)	(0.0257)	(0.0170)
Constant	-0.170***	-0.171***	-0.147***	-0.181***
	(0.0113)	(0.01000)	(0.0160)	(0.0129)
Observations - Countries	350 - 100	350 - 100	350 - 100	349 - 100
Number of Instruments	91	91	91	91
AR1 (P-Value)	0.0015	0.0020	0.0011	0.0068
AR2 (P-Value)	0.2175	0.1742	0.2155	0.1980

OID (P-Value)	0.3909	0.2336	0.6133	0.5500
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Note: AfT variables, and the variables "SHMAN", "NonAfT", "GDPC", "TP", "GFCF", "EDU", "INST", and "FINDEV" and the interaction variables have been considered as endogenous. The variable "POP" has been considered as exogenous. The regressions have used 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments. All variables have been standardized.

Table 4: Effect of AfT flows on poverty for varying levels of both export product concentration and the share of manufacturing exports in total exports

Estimator. Two-step system GMM

Variables	POVHC	POVHC	POVHC	POVHC
	(1)	(2)	(3)	(4)
POVHC _{t-1}	0.334*** (0.0241)	0.396*** (0.0210)	0.293*** (0.0326)	0.369*** (0.0162)
AfT*TOT*SHMAN*ECI	0.195*** (0.0350)			
AfT*TOT*SHMAN	-0.221*** (0.0281)			
AfT*TOT*ECI	0.0666* (0.0382)			
AfT*TOT	0.0782*** (0.0241)			
AfTINFRA*SHMAN*ECI		0.144*** (0.0380)		
AfTINFRA*SHMAN		-0.172*** (0.0301)		
AfTINFRA*ECI		-0.0719** (0.0308)		
AfTINFRA		0.0243 (0.0222)		
AfTPROD*SHMAN*ECI			-0.0410 (0.0362)	
AfTPROD*SHMAN			-0.281*** (0.0408)	
AfTPROD*ECI			-0.0336 (0.0318)	
AfTPROD			-0.174*** (0.0354)	
AfTPOL*SHMAN*ECI				0.251*** (0.0436)
AfTPOL*SHMAN				-0.197*** (0.0368)
AfTPOL*ECI				0.0693 (0.0422)
AfTPOL				-0.00289 (0.0245)
SHMAN*ECI	-0.0537	-0.120***	0.00702	0.00703

	(0.0436)	(0.0397)	(0.0496)	(0.0479)
SHMAN	0.254***	0.225***	0.228***	0.184***
	(0.0264)	(0.0271)	(0.0240)	(0.0277)
ECI	0.0540***	0.112***	0.0282	0.0642**
	(0.0202)	(0.0203)	(0.0286)	(0.0314)
NonAfT	-0.120***	-0.138***	-0.157***	-0.141***
	(0.0307)	(0.0260)	(0.0321)	(0.0244)
GDPC	-0.153***	-0.146***	-0.0856**	-0.276***
	(0.0315)	(0.0307)	(0.0424)	(0.0428)
TP	-0.175***	-0.0959***	-0.0847**	-0.0723**
	(0.0377)	(0.0342)	(0.0376)	(0.0294)
GFCF	-0.324***	-0.341***	-0.402***	-0.245***
	(0.0297)	(0.0245)	(0.0352)	(0.0180)
EDU	0.259***	0.307***	0.234***	0.243***
	(0.0299)	(0.0217)	(0.0314)	(0.0342)
INST	-0.0625**	-0.0222	-0.0178	0.0532*
	(0.0288)	(0.0364)	(0.0315)	(0.0311)
FINDEV	0.0631*	0.0191	0.0742**	-0.0694**
	(0.0377)	(0.0399)	(0.0301)	(0.0339)
POP	-0.243***	-0.240***	-0.314***	-0.0285
	(0.0310)	(0.0298)	(0.0272)	(0.0381)
Constant	-0.211***	-0.252***	-0.158***	-0.209***
	(0.0205)	(0.0174)	(0.0228)	(0.0144)
Observations - Countries	350 - 100	350 - 100	350 - 100	349 - 100
Number of Instruments	94	94	94	94
AR1 (P-Value)	0.0007	0.0002	0.0012	0.0009
AR2 (P-Value)	0.2956	0.2315	0.5508	0.5709
OID (P-Value)	0.3278	0.4423	0.5550	0.3646

Note: AfT variables, and the variables "ECI", "SHMAN", "NonAfT", "GDPC", "TP", "GFCF", "EDU", "INST", and "FINDEV" and the interaction variables have been considered as endogenous. The variable "POP" has been considered as exogenous. The regressions have used 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments. All variables have been standardized.

Table 5: Effect of AfT flows on poverty for varying levels of Income inequality
Estimator. Two-step system GMM

Variables	POVHC	POVHC	POVHC	POVHC
	(1)	(2)	(3)	(4)
POVHC _{t-1}	0.326*** (0.0161)	0.309*** (0.0178)	0.335*** (0.0145)	0.340*** (0.0127)
AfTTOT*GINI	-0.0487*** (0.0160)			
AfTTOT	0.0969*** (0.0143)			
AfTINFRA*GINI		-0.0719*** (0.0150)		
AfTINFRA		0.0723*** (0.0214)		
AfTPROD*GINI			-0.136*** (0.0137)	
AfTPROD			0.0521*** (0.0151)	
AfTPOL*GINI				0.0598** (0.0273)
AfTPOL				0.0372** (0.0182)
GINI	0.105*** (0.0164)	0.128*** (0.0143)	0.0927*** (0.0182)	0.0579*** (0.0137)
NonAfT	-0.116*** (0.0146)	-0.0960*** (0.0116)	-0.115*** (0.0153)	-0.0265* (0.0136)
GDPC	-0.197*** (0.0182)	-0.189*** (0.0207)	-0.127*** (0.0175)	-0.205*** (0.0206)
TP	-0.246*** (0.0262)	-0.199*** (0.0206)	-0.204*** (0.0256)	-0.125*** (0.0171)
GFCF	-0.307*** (0.0148)	-0.317*** (0.0148)	-0.308*** (0.0145)	-0.330*** (0.0168)
EDU	0.110*** (0.0131)	0.0909*** (0.0123)	0.0592*** (0.0161)	0.104*** (0.0166)
INST	0.0434*** (0.0151)	0.0166 (0.0118)	0.0590*** (0.0170)	0.0233** (0.0103)
FINDEV	0.0518*** (0.0178)	0.0654*** (0.0193)	0.0547** (0.0237)	0.0335*** (0.00884)
POP	-0.186*** (0.0186)	-0.191*** (0.0139)	-0.181*** (0.0190)	-0.143*** (0.0137)
Constant	-0.162*** (0.0156)	-0.160*** (0.0149)	-0.182*** (0.0129)	-0.150*** (0.0105)
Observations - Countries	308 - 97	308 - 97	308 - 97	307 - 97
Number of Instruments	91	91	91	91
AR1 (P-Value)	0.0035	0.0048	0.0059	0.0053
AR2 (P-Value)	0.1028	0.0924	0.1010	0.05

OID (P-Value)	0.7746	0.6585	0.7104	0.3541
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Note: AfT variables, and the variables "GINI", "NonAfT", "GDPC", "TP", "GFCF", "EDU", "INST", and "FINDEV" and the interaction variables have been considered as endogenous. The variable "POP" has been considered as exogenous. The regressions have used 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments. All variables have been standardized.

Table 6: Effect of AfT flows on poverty when countries experience both high export product concentration and high level of income inequality

Variables	POVHC	POVHC	POVHC	POVHC
	(1)	(2)	(3)	(4)
POVHC _{t-1}	0.360*** (0.0180)	0.364*** (0.0214)	0.428*** (0.0159)	0.354*** (0.0156)
AfT [*] TOT	-0.0167 (0.0310)			
AfT [*] TOT*ECI*GINI	-0.0254 (0.0207)			
AfT [*] TOT*GINI	-0.161*** (0.0242)			
AfT [*] TOT*ECI	-0.0328 (0.0273)			
AfT [*] INFRA*ECI*GINI		-0.0682** (0.0340)		
AfT [*] INFRA		-0.0144 (0.0226)		
AfT [*] INFRA*GINI		-0.135*** (0.0259)		
AfT [*] INFRA*ECI		-0.196*** (0.0219)		
AfT [*] PROD*ECI*GINI			0.0157 (0.0214)	
AfT [*] PROD			0.0122 (0.0263)	
AfT [*] PROD*GINI			-0.134*** (0.0221)	
AfT [*] PROD*ECI			0.0968*** (0.0283)	
AfT [*] POL*ECI*GINI				-0.146*** (0.0287)
AfT [*] POL				-0.0222 (0.0147)
AfT [*] POL*GINI				0.0543** (0.0249)
AfT [*] POL*ECI				0.165*** (0.0344)
ECI*GINI	0.0967*** (0.0233)	0.0831** (0.0409)	0.0890*** (0.0178)	0.189*** (0.0196)
GINI	0.179*** (0.0215)	0.154*** (0.0181)	0.155*** (0.0244)	0.0861*** (0.0137)
ECI	0.0632*** (0.0206)	0.126*** (0.0169)	-0.000203 (0.0169)	0.0442** (0.0200)
NonAfT	-0.190*** (0.0168)	-0.181*** (0.0246)	-0.120*** (0.0182)	-0.0558*** (0.0184)
GDPC	-0.0325	-0.0231	-0.101***	-0.292***

	(0.0368)	(0.0336)	(0.0291)	(0.0215)
TP	-0.183***	-0.189***	-0.0679**	-0.00119
	(0.0233)	(0.0285)	(0.0273)	(0.0179)
GFCF	-0.380***	-0.406***	-0.369***	-0.335***
	(0.0211)	(0.0160)	(0.0197)	(0.0146)
EDU	0.154***	0.223***	0.129***	0.161***
	(0.0258)	(0.0282)	(0.0168)	(0.0181)
INST	0.0117	-0.0443**	-0.0182	0.0230
	(0.0185)	(0.0203)	(0.0236)	(0.0203)
FINDEV	0.0468*	0.0725***	0.122***	0.00108
	(0.0279)	(0.0252)	(0.0278)	(0.0157)
POP	-0.227***	-0.269***	-0.162***	-0.0571*
	(0.0221)	(0.0215)	(0.0236)	(0.0293)
Constant	-0.200***	-0.222***	-0.226***	-0.186***
	(0.0185)	(0.0199)	(0.0137)	(0.0170)
Observations - Countries	308 - 97	308 - 97	308 - 97	307 - 97
Number of Instruments	94	94	94	94
AR1 (P-Value)	0.0042	0.0008	0.0189	0.0049
AR2 (P-Value)	0.1699	0.2742	0.2066	0.2500
OID (P-Value)	0.3567	0.4940	0.7600	0.6766

Note: AfT variables, and the variables "ECI", "GINI", "NonAfT", "GDPC", "TP", "GFCF", "EDU", "INST", and "FINDEV" and the interaction variables have been considered as endogenous. The variable "POP" has been considered as exogenous. The regressions have used 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments. All variables have been standardized.

Table 7: Effect of AfT flows on poverty in the context of greater extent of fiscal redistribution

Variables	POVHC	POVHC	POVHC	POVHC
	(1)	(2)	(3)	(4)
POVHC _{t-1}	0.452***	0.464***	0.388***	0.414***
	(0.0491)	(0.0509)	(0.0308)	(0.0401)
AfT ^{TOT} *FISCRED	-0.213***			
	(0.0738)			
AfT ^{TOT}	0.178***			
	(0.0588)			
AfT ^{INFRA} *FISCRED		-0.123*		
		(0.0656)		
AfT ^{INFRA}		0.234***		
		(0.0615)		
AfT ^{PROD} *FISCRED			-0.136***	
			(0.0475)	
AfT ^{PROD}			0.0428	
			(0.0436)	
AfT ^{POL} *FISCRED				-0.0677
				(0.0502)
AfT ^{POL}				0.0560
				(0.0414)

FISCRED	0.0731	0.0446	-0.0411	-0.0477*
	(0.0477)	(0.0457)	(0.0308)	(0.0283)
NonAfT	-0.239***	-0.209***	-0.179***	-0.138***
	(0.0361)	(0.0399)	(0.0360)	(0.0337)
GDPC	-0.107	-0.193**	-0.117*	-0.139***
	(0.0820)	(0.0804)	(0.0607)	(0.0493)
TP	-0.328***	-0.295***	-0.132**	-0.129***
	(0.0747)	(0.0676)	(0.0523)	(0.0483)
GFCF	-0.349***	-0.404***	-0.387***	-0.427***
	(0.0589)	(0.0502)	(0.0497)	(0.0317)
EDU	0.279***	0.265***	0.226***	0.248***
	(0.0734)	(0.0630)	(0.0702)	(0.0474)
INST	0.0810*	0.0558	0.0349	0.00595
	(0.0416)	(0.0399)	(0.0454)	(0.0384)
FINDEV	-0.0888*	0.00220	0.0136	0.0440
	(0.0503)	(0.0635)	(0.0458)	(0.0376)
POP	-0.212***	-0.225***	-0.247***	-0.217***
	(0.0685)	(0.0577)	(0.0550)	(0.0411)
Constant	-0.241***	-0.221***	-0.227***	-0.227***
	(0.0375)	(0.0360)	(0.0245)	(0.0294)
Observations - Countries	309 - 98	309 - 98	309 - 98	308 - 98
Number of Instruments	71	71	71	71
AR1 (P-Value)	0.0008	0.0005	0.0028	0.0032
AR2 (P-Value)	0.1276	0.1496	0.2848	0.1833
OID (P-Value)	0.7527	0.6780	0.7299	0.5019

Note: AfT variables, and the variables "FISCRED", "NonAfT", "GDPC", "TP", "GFCF", "EDU", "INST", and "FINDEV" and the interaction variables have been considered as endogenous. The variable "POP" has been considered as exogenous. The regressions have used 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments. All variables have been standardized.

Table 8: Effect of AfT flows on poverty for varying levels of import product diversification
Estimator. Two-step system GMM

Variables	POVHC	POVHC	POVHC	POVHC
	(1)	(2)	(3)	(4)
POVHC _{t-1}	0.356*** (0.0139)	0.370*** (0.0158)	0.381*** (0.0120)	0.362*** (0.0127)
AfT [*] TOT	0.00592 (0.0198)			
AfT [*] TOT*ICI	-0.136*** (0.0286)			
AfTINFRA		0.0385* (0.0205)		
AfTINFRA*ICI		-0.0921*** (0.0217)		
AfTPROD			-0.00293 (0.0192)	
AfTPROD*ICI			-0.0891*** (0.0224)	
AfTPOL				-0.0463** (0.0196)
AfTPOL*ICI				-0.0578*** (0.0149)
AfT [*] TOT*FKIDI				
AfTINFRA*FKIDI				
AfTPROD*FKIDI				
AfTPOL*FKIDI				
ICI	0.0984*** (0.0242)	0.0452** (0.0186)	0.0268** (0.0135)	0.0303* (0.0181)
FKIDI				
NonAfT	-0.0463** (0.0226)	-0.0481** (0.0226)	-0.0344* (0.0201)	0.0111 (0.0169)
GDPC	-0.192*** (0.0260)	-0.187*** (0.0221)	-0.144*** (0.0198)	-0.158*** (0.0202)
TP	-0.187*** (0.0271)	-0.155*** (0.0215)	-0.111*** (0.0160)	-0.0979*** (0.0194)
GFCF	-0.282*** (0.0204)	-0.268*** (0.0160)	-0.283*** (0.0174)	-0.243*** (0.0141)
EDU	0.0910*** (0.0282)	0.0856*** (0.0252)	0.0805*** (0.0174)	0.0728*** (0.0219)
INST	-0.000279 (0.0248)	-0.00220 (0.0254)	-0.0464* (0.0276)	-0.0351* (0.0180)

FINDEV	0.146***	0.154***	0.180***	0.138***
	(0.0230)	(0.0248)	(0.0360)	(0.0249)
POP	-0.200***	-0.244***	-0.261***	-0.242***
	(0.0252)	(0.0265)	(0.0196)	(0.0233)
Constant	-0.212***	-0.210***	-0.225***	-0.209***
	(0.0111)	(0.0115)	(0.00773)	(0.0106)
Observations - Countries	352 - 100	352 - 100	352 - 100	351 - 100
Number of Instruments	91	91	91	91
AR1 (P-Value)	0.0011	0.0024	0.0029	0.0057
AR2 (P-Value)	0.1092	0.1640	0.1188	0.1364
OID (P-Value)	0.3546	0.2696	0.3934	0.2660

Note: AfT variables, and the variables "ICI", "FKIDI", "NonAfT", "GDPC", "TP", "GFCF", "EDU", "INST", and "FINDEV" and the interaction variables have been considered as endogenous. The variable "POP" has been considered as exogenous. The regressions have used 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments. All variables have been standardized.

Table 9: Effect of AfT flows on poverty when countries experience both high import product concentration and high export product concentration

Variables	POVHC
	(1)
POVHC _{t-1}	0.444***
	(0.0221)
AfT*TOT*ECI*ICI	0.196***
	(0.0410)
AfT*TOT	0.0176
	(0.0220)
AfT*TOT*ICI	0.0698**
	(0.0322)
AfT*TOT*ECI	0.0758**
	(0.0299)
ECI*ICI	-0.0958**
	(0.0450)
ICI	0.0178
	(0.0228)
ECI	-0.00258
	(0.0228)
NonAfT	-0.122***
	(0.0248)
GDPC	-0.0502
	(0.0353)
TP	-0.158***
	(0.0259)
GFCF	-0.387***
	(0.0218)
EDU	0.123***
	(0.0271)
INST	0.0146
	(0.0286)
FINDEV	0.133***
	(0.0288)
POP	-0.250***
	(0.0199)
Constant	-0.209***
	(0.0135)
Observations - Countries	352 - 100
Number of Instruments	94
AR1 (P-Value)	0.0009
AR2 (P-Value)	0.9895
OID (P-Value)	0.3049

Note: AfT variables, and the variables "ECI", "ICI", "NonAfT", "GDPC", "TP", "GFCF", "EDU", "INST", and "FINDEV" and the interaction variables have been considered as endogenous. The variable "POP" has been considered as exogenous. The regressions have used 3 lags of the dependent variable as instruments, and 3 lags of endogenous variables as instruments. All variables have been standardized.

APPENDICES

Appendix 1: Definition and Source of variables

Variables	Definition	Sources
POVHC	Poverty headcount ratio at \$1.90 a day is the percentage of the population living on less than \$1.90 a day at 2011 international prices.	Data on this indicator is collected from the Word Development Indicators (WDI) of the World Bank and POVCALNET of the World Bank (see http://iresearch.worldbank.org/PovcalNet/povOnDemand.aspx).
AfTTOT, AfTINFRA, AfTPROD, AfTPOL	"AfTTOT" is the total real gross disbursements of Aid for Trade. "AfTINFRA" is the real gross disbursements of Aid for Trade allocated to the buildup of economic infrastructure. "AfTPROD" is the real gross disbursements of Aid for Trade for building productive capacities. "AfTPOL" is the real gross disbursements of Aid allocated for trade policies and regulation. All four variables are expressed in constant prices 2016, US Dollar.	<p>Author's calculation based on data extracted from the database of the OECD/DAC-CRS (Organization for Economic Cooperation and Development/Donor Assistance Committee)-CrFKEDIt Reporting System (CRS). Aid for Trade data cover the following three main categories (the CRS Codes are in brackets):</p> <p><u>Aid for Trade for Economic Infrastructure ("AfTINFRA")</u>, which includes transport and storage (210), communications (220), and energy generation and supply (230);</p> <p><u>Aid for Trade for Building Productive Capacity ("AfTPROD")</u>, which includes banking and financial services (240), business and other services (250), agriculture (311), forestry (312), fishing (313), industry (321), mineral resources and mining (322), and tourism (332); and</p> <p><u>Aid for Trade policy and regulations ("AfTPOL")</u>, which includes trade policy and regulations and trade-related adjustment (331).</p>
NonAfT	This is the measure of the development aid allocated to other sectors in the economy than the trade sector. It has been computed as the difference between the gross disbursements of total ODA and the gross disbursements of total Aid for Trade (both being expressed in constant prices 2016, US Dollar).	Author's calculation based on data extracting from the OECD/DAC-CRS database.
ECI	This is the Export Product Concentration Index. It is calculated using the Herfindahl-Hirschmann Index. Its values are normalized so that they range between 0 and 1. An index	United Nations Conference on Trade and Development (UNCTAD) Database. See online: http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=120

	value closer to 1 indicates a country's imports are highly concentrated on a few products. On the contrary, values closer to 0 reflect exports are more homogeneously distributed among a series of products.	
FKEDI	The export diversification index is computed by measuring the absolute deviation of the export structure of a country from world structure. This index is a modified Finger-Kreinin measure of similarity in trade. The diversification index takes values between 0 and 1. A value closer to 1 indicates greater divergence from the world pattern.	United Nations Conference on Trade and Development (UNCTAD) Database.
ICI	This is the import product concentration index. It is calculated using the Herfindahl-Hirschmann Index and its values are normalized so that they range between 0 and 1. An index value closer to 1 indicates a country's imports are highly concentrated on a few products. On the contrary, values closer to 0 reflect imports are more homogeneously distributed among a series of products.	United Nations Conference on Trade and Development (UNCTAD) Database.
SHMAN	Share (%) of manufactured exports in total export products	Author's calculation based on data from the UNCTAD database.
EDU	This is the measure of the education level. It is calculated as the average of the gross primary school enrolment rate (in percentage), secondary school enrolment rate (in percentage) and tertiary school enrolment rate (in percentage).	WDI
TP	Trade Policy of the domestic economy (Domestic Trade Policy). It is measured by the Trade Freedom Score; This is a component of the Economic Freedom Index. It is composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services. This score is graded on a scale of 0 to 100, with a rise in its value indicating lower trade barriers, i.e., higher trade liberalization, while a decrease in its value reflects rising trade protectionism.	Heritage Foundation (see Miller et al., 2019)
GFCF	Gross Fixed Capital Formation (% GDP)	WDI

FINDEV	This is the depth of financial development, measured by the domestic credit to private sector by banks, as a percentage of GDP.	WDI
GDPC	Per capita Gross Domestic Product (constant 2010 US\$)	WDI
POP	This is the measure of the total Population	WDI
GINI	This is the indicator of income inequality. It is an index of the market Gini, i.e., Gini of incomes before taxes and transfers. Values of this index range between 0 and 100, with higher values reflecting a more unequal income distribution.	Data retrieved from the Standardized World Income Inequality Database (SWIID) Version 8.0, February 2019 (see Solt, 2019). See online at: https://fsolt.org/swiid/
FISCREDIST	This is the measure of the size of fiscal redistribution. It is the difference between the market Gini (Gini of incomes before taxes and transfers) and net Gini of incomes (Gini of incomes after taxes and transfers). The Gini indices range between 0 and 100, with higher values reflecting a more unequal income distribution.	Author's calculation based on data on Gini of incomes retrieved from the SWIID Version 8.0, February 2019 (see Solt, 2019). See online at: https://fsolt.org/swiid/
INST	This is the variable representing the institutional and governance quality in a given country. It has been computed by extracting the first principal component (based on factor analysis) of the following six indicators of governance. These indicators include a measure of political stability and absence of violence/terrorism; the regulatory quality; an index of rule of law index; the government effectiveness index; the index of Voice and Accountability; and the index of corruption. Higher values of this index are associated with better governance and institutional quality, while lower values reflect worse governance and institutional quality.	Data on the components of the variable "INST" has been collected from World Bank Governance Indicators (WGI) developed by Kaufmann, Kraay and Mastruzzi (2010) and recently updated.

Appendix 2a: Descriptive statistics on unstandardized variables

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
POVHC	487	21.621	23.278	0	94.53
AfTTOT	496	1.94e+08	3.33e+08	965124.4	2.99e+09
AfTINFRA	496	1.11e+08	2.16e+08	23271	2.06e+09
AfTPROD	496	7.85e+07	1.34e+08	429359	1.69e+09
AfTPOL	485	3988967	1.40e+07	503	2.69e+08
ECI	498	0.355	0.204	0.071	0.946
FKEDI	498	0.713	0.115	0.369	0.924
ICI	498	0.135	0.060	0.047	0.415
FKIDI	498	0.444	0.086	0.239	0.770
SHMAN	496	34.849	27.544	0.116	94.881
NonAfT	496	5.97e+08	7.05e+08	9429088	6.63e+09
GDPC	500	3658.422	3427.871	224.1926	14700.86
TP	482	68.247	11.247	22.8	89.2
GFCF	490	23.315	7.951	3.101	61.177
GINI	442	43.769	6.845	21.933	68.533
FISCRED	442	2.404	4.125	-8.700	17.167
EDU	488	70.271	20.538	1.959	139.934
INST	499	-1.075	1.288	-3.973	3.024
FINDEV	496	31.656	24.988	0.756	152.131
POP	500	5.15e+07	1.80e+08	82993	1.38e+09

Appendix 2b: Descriptive statistics on standardized variables

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
POVHC	487	-2.96e-08	0.892	-1.757	1.782
AfTTOT	496	-1.20e-09	0.894	-1.778	1.782
AfTINFRA	496	1.82e-09	0.894	-1.698	1.789
AfTPROD	496	-9.59e-09	0.894	-1.761	1.772
AfTPOL	485	-1.56e-09	0.892	-1.611	1.779
ECI	498	-5.51e-08	0.895	-1.789	1.772
FKEDI	498	2.87e-08	0.895	-1.763	1.777
ICI	498	-2.39e-08	0.895	-1.743	1.766
FKIDI	498	-1.27e-07	0.895	-1.762	1.786
SHMAN	496	9.71e-09	0.894	-1.740	1.789
NonAfT	496	-4.70e-09	0.894	-1.759	1.775
GDPC	500	3.65e-08	0.895	-1.738	1.779
TP	482	-4.75e-08	0.891	-1.775	1.655
GFCF	490	-5.29e-08	0.893	-1.751	1.739
GINI	440	-2.19e-07	0.881	-1.692	1.707
FISCRED	442	1.96e-08	0.881	-1.702	1.732
EDU	488	-4.61e-08	0.893	-1.775	1.742
INST	499	-2.70e-08	0.895	-1.750	1.781
FINDEV	496	-6.04e-09	0.894	-1.746	1.760
POP	500	-7.89e-08	0.895	-1.696	1.640

Appendix 3: List of countries contained in the full Sample

Entire sample			
Albania	Congo, Dem. Rep.	Kenya	Philippines
Algeria	Congo, Rep.	Kyrgyz Republic	Rwanda
Angola	Costa Rica	Lao PDR	Senegal
Argentina	Cote d'Ivoire	Lesotho	Serbia
Armenia	Croatia	Madagascar	Seychelles
Azerbaijan	Dominican Republic	Malawi	Sierra Leone
Bangladesh	Ecuador	Malaysia	South Africa
Belarus	Egypt, Arab Rep.	Mali	Sri Lanka
Belize	El Salvador	Mauritania	Suriname
Benin	Eswatini	Mauritius	Tajikistan
Bhutan	Gabon	Mexico	Tanzania
Bolivia	Gambia, The	Moldova	Thailand
Botswana	Georgia	Mongolia	Timor-Leste
Brazil	Ghana	Montenegro	Togo
Burkina Faso	Guatemala	Morocco	Tonga
Burundi	Guinea	Mozambique	Tunisia
Cabo Verde	Guinea-Bissau	Nepal	Turkey
Cambodia	Guyana	Nicaragua	Uganda
Cameroon	Honduras	Niger	Ukraine
Central African Republic	India	Nigeria	Uruguay
Chad	Indonesia	North Macedonia	Vanuatu
Chile	Iran, Islamic Rep.	Pakistan	Venezuela, RB
China	Jamaica	Panama	Vietnam
Colombia	Jordan	Paraguay	Zambia
Comoros	Kazakhstan	Peru	Zimbabwe