Does the Impact of Aid for Trade on Export Product Diversification depend on Structural economic policies in Recipient-Countries?

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ABSTRACT

This paper examines the extent to which Aid for Trade interventions interact with long-term structural economic policies in recipient countries, to affect these countries' export product diversification path. These include trade policy, international financial policy and domestic financial development. We additionally consider institutional and governance quality which, by contributing to the promotion of a supportive business environment, could also alter countries' path of export product diversification. The analysis focuses on 112 countries over the period 2002–2015 and uses the system Generalised Method of Moments approach. Results suggest that Aid for Trade is conducive to export product diversification in countries that implement greater trade policy liberalisation, or have greater financial openness, or better institutional and governance quality. However, Aid for Trade tends to enhance export product concentration in countries with higher levels of financial development.

JEL Classification: F35, F14, O11
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1. INTRODUCTION

The Aid for Trade (AfT) Initiative was launched at the 2005 Hong Kong Ministerial Conference of the World Trade Organisation (WTO), with a view to helping developing countries and the Least Developed Countries (LDCs) better integrate into the multilateral trading system. As per Paragraph 57 of the Hong Kong Ministerial Declaration (see WTO 2005), this Initiative aimed '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.' It is worth noting that AfT is part of the Official Development Assistance (ODA) allocated to developing countries.

The launch of the AfT Initiative has triggered a debate in academic circles, as well as in international institutions that are directly involved on international trade issues, on the effectiveness of AfT inflows in recipient countries' economies. It is still not clear what 'AfT effectiveness' means: should AfT effectiveness be evaluated in relation to the mandate given in the aforementioned Paragraph 57 of the Hong Kong Ministerial Declaration (i.e., … to help recipient-countries expand their trade) or should it be assessed in terms of recipient-countries' macroeconomic (or microeconomic) performance such as higher economic growth, poverty alleviation, lower intra-country inequality, higher domestic private investment, etc?

Most current studies (either empirical or field-based case studies) have assessed the effectiveness of AfT along the lines of the mandate of the Hong Kong Ministerial Declaration. These studies have indeed examined the impact of AfT inflows on recipient-countries trade, and notably their export performance (e.g. Calì and TeVelde 2011;Busse *et al* 2012; Helble *et al* 2012; Vijil and Wagner 2012; Bearce *et al* 2013; OECD-WTO 2013; Hühne *et al* 2014a; Ghimire *et al* 2016; Martínez-Zarzoso *et al* 2017; and Tadesse *et al* 2017), and tend to report a positive impact of AfT programmes on recipient countries' export performance. However, very few analyses (e.g. Kim 2012; Hühne *et al* 2014b; Gnangnon and Roberts 2015, 2017) have focused on the impact of AfT inflows on recipient countries' export upgrading, in particular export product diversification.

At the same time, the literature that has examined the determinants of export upgrading, in particular export product diversification (e.g. Imbs and Wacziarg 2003; Hausmann *et al* 2007; Harding and Javorcik 2012; Parteka and Tamberi 2013; Zhu and Fu 2013; Amighini and Sanfilippo 2014; and Gnangnon and Roberts 2015, 2017) has emphasised that a number of structural economic policies could matter for export product upgrading. Structural economic policies refer here to long term policies that could influence countries' export product diversification path. These include trade policy, international financial policy, and domestic financial development. In addition, institutional quality has been identified by a number of these authors as key for export product upgrading. Setting up good governance and institutional quality is a long-time process, so we also consider the governance and institutional quality as part of countries' structural economic policies.

The current paper contributes to the existing empirical literature on the impact of AfT on recipient-countries' export product diversification, by investigating whether such impact is dependent upon these countries' structural economic policies. To the best of our knowledge, this is the first paper that seeks to explore the link between AfT and export diversification, taking explicitly into account countries' structural economic policies. The empirical analysis, based on 112 AfT-recipient countries, over the period 2002–2015, suggests that structural economic policies, including trade policies, financial policies and financial development, as well as institutional and governance quality, do matter for the impact of AfT on export product

diversification. It is important to underline here that a longer time-period would have helped address more accurately the topic of this paper, as it may take time for countries to diversify their export product baskets. Nevertheless, we believe that the reliance on 14 years – based on data availability – provides *prima facie* evidence on whether the impact of AfT on export product diversification depends on recipient countries' structural economic policies.

The rest of the paper is organised as follows. Section 2 discusses, from a theoretical perspective, how AfT could influence export product diversification. Section 3 lays out the model specification and discusses how structural economic policies could matter for the impact of AfT on export product diversification. Section 4 presents the empirical methodology for the estimation of the model presented in Section 3. Section 5 interprets the empirical results and Section 6 concludes.

2. Theoretical Framework on the Impact of Aid for Trade on Export Diversification

The debate on whether countries should pursue an export specialisation strategy or diversify the structure of their exports (e.g. Hummels *et al* 2001; Hausmann and Rodrik 2003; Imbs and Wacziarg 2003; Yi 2003; Hausmann *et al* 2007; Naudé *et al* 2010) tends to conclude at least for a diversification of export product baskets from primary commodities towards manufacturing products (a good literature review on this debate can be found in Kaulich 2012; and Gnangnon and Roberts 2015, 2017). This applies particularly to LDCs, that are heavily dependent on a narrow basket of primary export products.

A very small number of studies have explored the impact of AfT on export diversification, although authors such as Osakwe (2007) and Munemo (2011) have investigated the export diversification impact of overall official development assistance. Kim (2012) provides evidence that AfT flows have a positive impact on export diversification, with the caveat that this diversification did not spread to exports associated with higher income countries. Hühne *et al* (2014b) have assessed whether AfT has helped recipient-countries upgrade and diversify their exports. They have found that while AfT has been effective in promoting recipients' export of manufactures, it has exerted no significant impact on primary commodities. These findings apply both to trade relations with donor countries and in south-south trade with other developing countries. Gnangnon and Roberts (2015, 2017) have obtained evidence that AfT programs have been conducive to export product upgrading in recipient countries.

We draw our theoretical discussion on the impact of AfT programmes on export upgrading, including export product diversification, from Gnangnon and Roberts (2015, 2017). We consider three main AfT categories based on the classification by the Organisation for Economic Cooperation and Development (OECD) of AfT. These include AfT related to Economic Infrastructure, which encompasses transport and storage, communications, and energy generation

and supply; AfT dedicated to building productive capacity, which includes banking and financial services, business and other services, agriculture, fishing, industry, mineral resources and mining, and tourism; and AfT related to Trade Policy and Regulations, which comprises trade policy and regulations and trade-related adjustment interventions. Our main hypothesis hinges on the fact that AfT interventions are aligned with the national development strategies of recipient countries and, therefore, any expected effect of the AfT programmes would be dependent on the national export strategy pursued by these countries.

The impact of total AfT inflows that accrue to recipient-countries on the diversification of their export baskets depends on the impact of each category of this total AfT, as well as on how the AfT components interact with each other to influence recipient countries' export product diversification. The dominant category of AfT inflows, namely AfT for economic infrastructure, does not target a particular export sector, and hence could be sector-neutral (Cirera and Winters 2015). Nonetheless, this category of AfT contributes to reducing trade costs in recipient countries, including through hard and soft infrastructure (through the enhancement of production and export facilities), and could therefore help beneficiary countries achieve in the medium term their desired export strategy. The latter could either be export specialisation – in such a case the AfT interventions would be associated with concentration of exports products – or export diversification. In line with this argument, Cirera and Winters (2015) have noted that in the absence of large sector distortions, these interventions may favour sectors that enjoy a comparative advantage.

AfT programmes for building productive capacity target specific sectors in the recipient country, and therefore could either reinforce the country's comparative advantage, thereby leading to further export product concentration, or help the country diversify its export products – in line with its national export strategy – in which case these AfT interventions would be associated with export product diversification.

Finally, as AfT support for trade policy and regulations aims at reducing administrative costs and regulatory bottlenecks to trade (Busse *et al* 2012; Calì and TeVelde 2011), one may not expect any direct effect of these interventions on export product diversification. Nevertheless, it is still possible to obtain a positive medium-term effect of this AfT category on the country's export strategy. Meanwhile, it is arguable that this category of AfT intervention helps to build or strengthen the trade skills of policymakers in recipient-countries, and hence better equip them to design appropriate trade policies that tally with their export strategy. Even in this case, AfT programmes for trade policy and regulations could be associated either with export product concentration or export product diversification, depending on the national export strategy of the recipient country.

AfT could also influence export diversification through its impact on FDI inflows. For example, if AfT programmes for productive capacity building are

used to enhance investment in physical capital in recipient countries, which could have been financed by private investors including foreign investors, then this AfT category would likely lead to lower FDI inflows. In this context, a positive impact of AfT for productive capacity on export product diversification would not likely take place through higher FDI inflows. At the same time, as AfT related to economic infrastructure and AfT associated with trade policy and regulations could not be financed by private (including foreign) investors, there would be no crowding out effect of AfT on FDI; instead, these two types of AfT could enhance FDI inflows. In addition, as discussed above, as both AfT for economic infrastructure and AfT associated with trade policy and regulations could help reduce trade costs, they would likely attract higher FDI inflows. Additionally, AfT allocated for trade policies and regulations could help recipient-countries further liberalise their trade policies, which could result in higher FDI inflows. In turn, the latter could contribute to export product diversification.

Additionally, AfT could help fill the gap left by the fall in FDI in the context of FDI reversals. In this context, AfT could replace FDI inflows in contributing to the diversification of export products basket. Selaya and Sunesen (2012) have provided evidence that aid invested in complementary inputs (such as public infrastructure and human capital investments) draws in FDI, whereas aid invested in physical capital, i.e. directed towards productive sectors (such as agriculture, manufacturing, banking, etc) crowds out FDI. Overall, the direction of the impact of AfT interventions on export product diversification may depend on the type of AfT programme, as well as the possible interplay between the different categories of AfT in influencing export product diversification. The direction of this impact also hinges on the recipient-countries' export strategy, which could be either export product specialisation in some countries and export product diversification in others.

3. Model Specification and Discussion on how Structural Economic Policies could influence the Impact of AfT on Export Product Diversification

3.1 Model specification

To define the model specification, we draw on the existing literature on the determinants of export product upgrading and particularly export product diversification (e.g. Imbs and Wacziarg 2003; Hausmann *et al* 2007; Harding and Javorcik 2012; Parteka and Tamberi 2013; Zhu and Fu 2013; Amighini and Sanfilippo 2014; and Gnangnon and Roberts 2015, 2017). In particular, we consider the following structural economic policies (in addition to the AfT inflows) for the model specification: the domestic trade policy, the degree of international financial openness, the depth of domestic financial development, and the quality of governance and institutions. In addition to these variables, we add income per capita and the size of the population, which appear almost always in models concerning the determinants of export upgrading.

Against this background, we postulate the following model:

$$EXPCONC_{it} = \beta_0 + \beta_1 EXPCONC_{it-1} + \beta_2 AfT_{it-2} + \beta_3[(VAR_{it})*(AfT_{it-2})] + \beta_4 DTP_{it} + \beta_5 FINPOL_{it} + \beta_6 FINDEV_{it} + \beta_7 EDU_{it} + \beta_8 INST_{it} + \beta_9 Log(GDPC)_{it} + \beta_{10} Log(GDPC)^2_{it} + \beta_{11} Log(POP)_{it} + \mu_i + Trend + \omega_{it} \quad (1)$$

where i represents the country's relevant index; t denotes the annual time-period. The panel dataset used to perform the analysis is unbalanced and covers 112 AfT-recipient countries, over the period 2002–2015. β_1 to β_{11} are parameters to be estimated. μ_i are countries' fixed effects; *Trend* is a time trend capturing the pattern of export product concentration over years. ω_{it} is a well-behaved error term.

The dependent variable EXPCONC is the index of export product concentration; a rise in the values of this variable indicates a rise in the degree (or level) of export product concentration and hence a decline in the level of export product diversification. Lower values of this index refer to a decline in the level of export product concentration, i.e. a rise in the degree of export product diversification. The one-year lag of the dependent variable has been introduced in model (1) to capture the state dependence of the EXPCONC variable (see for example, Harding and Javorcik 2012; Amighini and Sanfilippo 2014; and Gnangnon and Roberts 2015, 2017).

AfT represents the variable measuring the AfT allocated to a country in a given year, expressed as a share of this country's GDP. It could be measured either by the total gross AfT inflows allocated to a given country (percentage of GDP) – denoted AfTTOT - or its three components, namely AfT allocated for economic infrastructure (percentage of GDP), denoted AfTINFRA, AfT allocated to productive capacity building (percentage of GDP), denoted AfTPROD, and AfT flows for trade policies and regulations, denoted AfTPOL.

We introduce in model (1) the AfT variable with a two-year lag in order to capture the lagged impact of AfT on recipient countries' export product concentration (or diversification). This follows from the argument put forth by Calì and TeVelde (2011) that, as the bulk of AfT inflows is devoted to building trade-related infrastructure and productive capacity in the recipient countries, there could be a time lag in the impact of AfT inflows on trade, in particular export product diversification of recipient countries. In particular, it has been argued that the trade-promoting effect of AfT could take some time, up to two years, to really materialise (see also Calì and TeVelde 2008; Brazys 2010; Calì and TeVelde 2011; Bearce *et al* 2013 who used the two-year lag of AfT in their empirical analysis of AfT effectiveness). This 2-year lag is consistent with the expected delay in implementation after appropriation. In addition, the 2-year lag helps reduce the potential for endogeneity bias, as a country's appropriation of AfT may be influenced by its current or past export level (see Bearce *et al* 2013).

The control variables used in model (1) include:DTP is the measure of domestic trade policy liberalisation. According to Krugman and Venables (1990) and Dennis and Shepherd (2011), trade liberalisation can act as market

extension, and hence contribute to the promotion of export diversification. Along the same lines, Costas *et al* (2008) note that the potential gains generated by trade may cause major product diversification. However, Agosin *et al* (2012) have argued that in economies highly dependent on primary commodities for their exports, trade reforms can induce export specialisation or concentration, by increasing the profitability of traditional (commodities) sectors.

FINPOL is the impact of financial openness policy (i.e. global financial integration) on export product diversification. It has rarely been investigated in the empirical literature. However, the literature has examined the impact of foreign direct investment inflows - which are the result of financial openness policies - on export upgrading (e.g. Gui-Diby and Renard 2015 for an extensive literature review on the effects of FDI inflows on industrialisation; see also Harding and Javorcik 2012; Zhu and Fu 2013 and Amighini and Sanfilippo 2014). Opening up to international financial markets can attract international private capital inflows, in particular long-term capital inflows (FDI inflows). These capital inflows could in turn facilitate export product diversification in recipient-countries through, *inter alia*, the creation of forward and backward linkages, the possibility for domestic firms to hire a more experienced and skilled workforce, and more generally through the transfer of positive (pecuniary and non-pecuniary) externalities – such as technology – to local firms (see Gorg and Greenaway 2004; Lall and Narula 2004; Amighini and Sanfilippo 2014).

Multinationals can also act as channels of breakthrough transformation for the local economies in which they invest, as they can contribute not only to increasing productivity in existing industries but, importantly, they can also bring new ideas and best practices to start exploring new production activities (see Moran 2010). Hence FDI inflows can promote export upgrading in the host countries by facilitating the production by foreign firms of new and more sophisticated goods that are then exported. These newly produced and exported goods can also generate positive spillovers for local firms, for example, by reducing their entry costs in foreign markets (Crespo and Fontoura 2007; Harding and Javorcik 2012; see also Amighini and Sanfilippo 2014). Amighini and Sanfilippo (2014) have reported that South–South FDI inflows foster diversification in key low-tech industries such as agro-industry and textiles, and raise the average quality of manufacturing export in sub-Saharan economies. Gnangnon and Roberts (2015, 2017) have shown evidence that FDI inflows are conducive to export upgrading, including both export product diversification and improvement in export product quality.

While financial openness can enhance capital allocation and orient capital inflows interested in international trade activities towards the production and export of new products, it could also lead investors, particularly multinationals – in the case of FDI oriented towards the tradables sector – to invest in the sector of specialisation of recipient countries. This would result in higher export product concentration in recipient countries. Overall, financial openness could lead either to export product diversification or export product concentration.

FINDEV represents the measure of the depth of domestic financial development in a given country. Kletze and Bardhan (1987) have argued that financial development can increase countries' comparative advantage in industries that use more external financing. Thus, financial development can influence the export product diversification path of a country. In the same vein, Agosin *et al* (2012) have postulated that financial development can be conducive to export diversification if financing-dependent industries produce more differentiated products. However, the authors have cautioned that if investors decide to concentrate financial resources in existing activities where the economy has a competitive advantage, then financial development would be associated with export product concentration.

EDU is the gross enrolment rate in secondary school, and acts as a proxy for the level of human capital in a given country. We acknowledge that this proxy is not necessarily appropriate, because secondary school enrolment rate would have a lagged effect on the level of human capital, especially if a country has had quite unstable education policies in the past. An appropriate measure of human capital could be educational attainment data (the data could be obtained online at: http://barrolee.com/Lee_Lee_LRdata.htm) compiled by Barro and Lee (2013). However, this data exists until 2010, which if used in the current study, would significantly reduce the number of observations in our dataset. Another option in the analysis may be to use the average of enrolment rates in primary, secondary and tertiary school, using the World Development Indicators of the World Bank. However, there are many missing data for the tertiary school enrolment rate, which would again limit the number of observations in our dataset.

From a theoretical perspective, we expect a higher level of education to be associated with lower export product concentration, and hence a higher level of export product diversification. Aghion and Howitt (1998) have argued that human capital characteristics, among other factors, can affect the general conditions for product diversification. Agosin *et al* (2012) have also argued that by allowing countries to change their specialisation patterns from commodities to manufactured goods, human capital accumulation can lead to export diversification. However, human capital accumulation can also induce export product concentration if it is used to develop existing activities, i.e. in the sectors of comparative advantage of the country.

INST is the measure of a country's institutional quality. The role of institutional and governance quality in influencing export structure, including export product diversification, has been highlighted by many previous studies, such as Hausmann *et al* (2007); Cabral and Veiga (2010); Zhu and Fu (2013); Amighini and Sanfilippo (2014); and Gnangnon and Roberts (2015, 2017). Good institutional and governance quality helps to reduce the level of uncertainty inherent in interactions between private actors, as well as between the public sector and private actors (see North 1990). As a result, transaction costs would decline and the business environment would improve. Therefore,

we expect that good institutional and governance quality would be conducive to export product diversification.

We compute the synthetic measure of governance and institutional quality by using factor analysis (notably Principal Component Analysis – PCA) (e.g. Globerman and Shapiro 2002; Gnangnon and Roberts 2017). In particular, we use the first principal components of six indicators of governance, including Voice and Accountability, political stability and absence of violence/terrorism, regulatory quality, rule of law, government effectiveness, and corruption. To compute this index, we use the first principal component of the PCA to extract weights (or scores) to compute our synthetic index of institutional quality. Higher values of INST represent better governance and institutional quality.

GDPC represents countries' real per capita income, which is a proxy for their level of development. While the positive impact of real per capita income (as a measure of the size of the market) has been highlighted by Dixit and Norman (1980) and Helpman and Krugman (1985), more recent empirical studies (Imbs and Wacziarg 2003; Klinger and Lederman 2004, 2011; Cadot *et al* 2011; Parteka and Tamberi 2013) have underlined the non-linear relationship between countries' development level and their export product diversification path. In particular, they have found that countries first diversify and then specialise in their production (and exports) over their stages of development, i.e. as countries develop, export specialisation decreases (i.e., export diversification increases).

POP is the size of the total population in a given country. We expect countries with a larger population to be less open to international trade (see Rodrik 1995), and hence to be less incentivised to diversify their export products. At the same time, a rise in the size of population, in particular if an important share of this population is well educated, could provide domestic and foreign investors with the opportunity to tap into the quality of human capital to innovate and develop new exportable products. In this case, a rise in the population could be associated with export product diversification.

VAR denotes a structural policy variable. It could be the variable DTP, FINPOL, FINDEV, or INST. Hence, the coefficient β_3 will hold different values and statistical significance depending on the VAR variable interacted with the AfT variable.

We report in Appendix 1 the description and source of all variables used in the analysis. Appendix 2 displays the list of countries used in the analysis, and Appendix 3 presents standard descriptive statistics on these variables.

3.2 Does the impact of Aid for Trade on export product diversification depend on the recipient-countries' structural economic policies?

We discuss, from a theoretical perspective, whether the impact of AfT interventions on export product concentration (or export product diversification) is dependent upon recipient-countries' structural economic policies.

We start with countries' trade policy as our first structural policy measure. As AfT aims to reduce trade costs and help recipient countries expand their

supply of goods and services in international markets, we argue that AfT would lead to higher export product diversification (in line with the recipient country's national export development strategy) if the recipient-country further liberalises its trade regime, so as to increase the competitiveness of its exportable products.

Similarly, as financial openness provides countries with the opportunity to attract private capital flows that would help overcome financial resources deficiencies in the recipient-country, we expect greater financial openness to facilitate higher investment inflows, including FDI inflows. These investment inflows could in turn complement AfT inflows in promoting export product diversification in the recipient-countries. Gnangnon and Roberts (2015, 2017) have discussed the complementarity or substitutability between AfT inflows and FDI inflows, and obtained evidence that there is a significant interplay between FDI and AfT inflows in affecting export upgrading in recipient countries. As financial openness may also lead to export product concentration (see Section 3.1), its interaction with AfT programmes could result in export product concentration in AfT recipient-countries if AfT inflows were primarily used to strengthen countries' supply of existing products (once again in line with the national development strategy of the recipient-country).

As for financial development, we argue that by reducing liquidity constraints, greater development of domestic financial markets could be complementary with AfT inflows in promoting export product diversification. However, it is still possible that AfT inflows could be complementary with recipient-countries' degree of financial development in generating higher export product concentration. This is because both AfT inflows and domestic financial development may lead to export product concentration (see discussion in Section 2).

As for the institutional and governance quality variable, we expect AfT interventions to be effective in terms of promoting export product diversification in countries with good institutional and governance quality. Indeed, in an unfavourable business environment, we would not expect AfT to be conducive to export product diversification, even if the government had a very good national export development strategy, with at heart the diversification of its export products. Overall, whether the influence of AfT inflows on recipient countries' export product diversification is dependent upon these countries' structural economic policies, is an empirical matter.

4. Econometric Strategy

To obtain reliable estimates from the estimations of model (1) (or its variants), we need to address certain endogeneity problems that could bias the regression estimates. The first endogeneity problem stems from the presence of the one-year lag of the dependent variable as an explanatory variable, which would likely create the so-called Nickell bias (Nickell 1981). This bias is particularly severe for the exogenous regressors if T is small, which is the case in this study (T = 14, and N = 112). The second endogeneity problem stems from the bi-

directional causality between several regressors, including the domestic trade policy liberalisation variable (DTP), the level of financial openness (FINPOL), the level of financial development (FINDEV) and the level of education (EDU), and the dependent variable. It is worth noting that as we have used the two-year lag for the AfT variables, we consider this variable as exogenous in our model specifications. Furthermore, the use of factor analysis to compute the synthetic indicator of governance and institutional quality helps to mitigate the endogeneity bias that might arise from reverse causality associated with the impact of the dependent variable on the institutional variable (see also for example, Portugal-Perez and Wilson 2012 p 1302).

To address these endogeneity problems, we estimate model (1) by means of the Generalised Methods of Moments (GMM) estimator, which is appropriate in dynamic models like ours. In particular, we use the two-step system GMM estimator proposed by Blundell and Bond (1998), which combines the equation in differences with the 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 two-step system GMM estimator performs better than the first-difference GMM estimator suggested by Arellano and Bond (1991), in particular when cross-sectional variability dominates time variability and when there is a strong persistence in the time series under investigation (Blundell and Bond 1998). Incidentally, Roodman (2009) suggests avoiding using the difference GMM estimator when the panel dataset is unbalanced, as this estimator has a weakness of magnifying gaps.

The validity of this estimator is assessed by the standard Sargan test of over-identifying restrictions, which determines the validity of the instruments used in the estimations. We also perform the Arellano–Bond (AB) test of first-order serial correlation in the error term (denoted AR(1)) and no second-order autocorrelation in the residuals (denoted AR(2)). We additionally report the results over the test of third-order serial correlation in the error term (denoted AR(3)), as it provides an insight into whether there is an omitted variable in the model (a p-value relating to this test higher than 0.10 provides an indication that at the 10 per cent level, there is likely no omitted variable problem in the model). Incidentally, we present the number of instruments used in the regressions because the aforementioned tests may lose power if the number of countries is lower than the number instruments (e.g. Roodman 2009).

Against this background, the empirical analysis (using the two-step system GMM) is performed as follows:

First, we estimate model (1) without the interaction variable ($VAR*AfTTOT_{t-2}$) over the entire sample of 112 countries, where the AfT variable is measured either by total AfT flows (percentage of GDP) or by the components of the latter. The results of the estimations are presented in Table 1.

Second, we use as the measure of the AfT variable the total AfT (percentage of GDP) (AfTTOT), and estimate different specifications of model (1) with each

Table 1: Does the impact of Aid for Trade Inflows on Export Product Concentration depend on Structural economic policies?

Estimator: Two-Step System GMM

VARIABLES	*EXPCONC (1)*	*EXPCONC (2)*	*EXPCONC (3)*	*EXPCONC (4)*	*EXPCONC (5)*
$EXPCONC_{t-1}$	0.764*** (0.0124)	0.777*** (0.0126)	0.771*** (0.0118)	0.782*** (0.0120)	0.775*** (0.0126)
$AfTTOT_{t-2}$	0.00742*** (0.000882)				
$AfTINFRA_{t-2}$		0.00550*** (0.000979)			0.00753*** (0.000825)
$AfTPROD_{t-2}$			0.00841*** (0.00151)		0.00494*** (0.00151)
$AfTPOL_{t-2}$				0.0421*** (0.00622)	0.0420*** (0.00519)
DTP	0.000128 (0.000107)	0.000178* (0.000101)	0.000115 (0.000112)	–0.000209** (9.03e-05)	–0.000219** (8.88e-05)
FINPOL	–4.33e-05 (5.73e-05)	–2.28e-05 (5.82e-05)	–3.72e-05 (5.73e-05)	8.65e-05 (5.43e-05)	0.000217*** (6.16e-05)
FINDEV	0.000119* (6.42e-05)	6.62e-05 (8.25e-05)	8.58e-05 (6.75e-05)	–1.18e-05 (7.58e-05)	–1.04e-05 (7.96e-05)
EDU	–0.000376*** (0.000101)	–0.000353*** (9.02e-05)	–0.000395*** (9.87e-05)	–0.000173 (0.000118)	–0.000257* (0.000142)
INST	–0.0115*** (0.00138)	–0.0114*** (0.00159)	–0.0107*** (0.00121)	–0.00865*** (0.00226)	–0.0123*** (0.00210)
Log(GDPC)	–0.100*** (0.0216)	–0.115*** (0.0189)	–0.0962*** (0.0200)	–0.0271 (0.0221)	0.0285 (0.0214)
$[Log(GDPC)]^2$	0.00714*** (0.00138)	0.00782*** (0.00121)	0.00661*** (0.00130)	0.00248* (0.00138)	–0.000604 (0.00133)
Log(POP)	–0.00481*** (0.00102)	–0.00566*** (0.000891)	–0.00613*** (0.000860)	–0.00518*** (0.00103)	–0.00356** (0.00138)
Time	–0.00201*** (0.000181)	–0.00197*** (0.000197)	–0.00145*** (0.000235)	–0.000571* (0.000304)	–0.00111*** (0.000335)
Constant	4.526*** (0.438)	4.517*** (0.450)	3.425*** (0.534)	1.371** (0.633)	2.172*** (0.676)
Observations -Countries	911 – 112	905 – 112	910 – 112	831 – 111	827 – 111
Number of Instruments	100	100	100	100	102
AR1 (P-Value)	0.0004	0.0004	0.0003	0.0018	0.0020
AR2 (P-Value)	0.9390	0.6507	0.8439	0.5006	0.5298
AR3 (P-Value)	0.3856	0.6119	0.4892	0.8863	0.7618
Sargan (P-Value)	0.5321	0.5246	0.5384	0.2378	0.3175

Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust Standard Errors are in parentheses. In the two-step GMM system estimations, the variables TP, EDU, FINDEV and FINPOL have been considered as endogenous. The other variables have been considered as exogenous.

Table 2: Does the impact of Aid for Trade Inflows on Export Product Concentration depend on Structural economic policies?

Estimator: Two-Step System GMM
Dependent variable: EXPCONC

VARIABLES	[DTP]*[AfTTOT$_{t-2}$] *(1)*	[FINPOL]*[AfTTOT$_{t-2}$] *(2)*	[FINDEV]*[AfTTOT$_{t-2}$] *(3)*	[INST]*[AfTTOT$_{t-2}$] *(4)*
EXPCONC$_{t-1}$	0.766***	0.767***	0.762***	0.765***
	(0.0136)	(0.0134)	(0.0119)	(0.0114)
AfTTOT$_{t-2}$	0.0402***	0.00906***	0.00487***	0.00744***
	(0.00433)	(0.00152)	(0.00170)	(0.000915)
[VAR]*[AfTTOT$_{t-2}$]	–0.000498***	–5.01e-05	7.80e-05**	–0.000285
	(6.38e-05)	(3.30e-05)	(3.79e-05)	(0.000652)
DTP	0.000530***	9.74e-05	0.000151	0.000168
	(0.000119)	(0.000125)	(9.88e-05)	(0.000118)
FINPOL	8.83e-06	1.73e-05	1.84e-05	–4.95e-05
	(6.10e-05)	(0.000110)	(6.36e-05)	(5.96e-05)
FINDEV	0.000190***	0.000123*	0.000108*	0.000130**
	(6.37e-05)	(6.38e-05)	(6.56e-05)	(5.92e-05)
EDU	–0.000404***	–0.000347***	–0.000368***	–0.000385***
	(0.000102)	(0.000109)	(8.93e-05)	(9.83e-05)
INST	–0.00949***	–0.0120***	–0.0127***	–0.0118***
	(0.00146)	(0.00109)	(0.00151)	(0.00138)
Log(GDPC)	–0.0731***	–0.0945***	–0.0926***	–0.0926***
	(0.0169)	(0.0212)	(0.0191)	(0.0208)
[Log(GDPC)]^2	0.00499***	0.00674***	0.00654***	0.00665***
	(0.00108)	(0.00137)	(0.00123)	(0.00137)
Log(POP)	–0.00548***	–0.00525***	–0.00498***	–0.00505***
	(0.00116)	(0.000974)	(0.00108)	(0.00110)
Time	–0.00162***	–0.00193***	–0.00193***	–0.00203***
	(0.000140)	(0.000211)	(0.000205)	(0.000187)
Constant	3.654***	4.351***	4.334***	4.540***
	(0.323)	(0.494)	(0.467)	(0.428)
Observations -Countries	911 – 112	911 – 112	907 – 112	911 – 112
Number of Instruments	101	101	101	101
AR1 (P-Value)	0.0004	0.0004	0.0004	0.0004
AR2 (P-Value)	0.9178	0.9274	0.9549	0.9433
AR3 (P-Value)	0.4825	0.3851	0.3987	0.3785
Sargan (P-Value)	0.6158	0.5132	0.4962	0.5338

Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust Standard Errors are in parentheses. In the two-step GMM system estimations, the variables TP, EDU, FINDEV and FINPOL have been considered as endogenous. The other variables have been considered as exogenous.

of the five VAR variables cited above. The results of these estimations are reported in Table 2. We further analyse the influence of the interaction between the impact of AfTTOT and each of the VAR variables on the ECI variable by examining graphically the marginal impact of AfT on export product concentration for various values of the VAR considered.

The mathematical formula that allows investigation of these marginal impacts are derived from model (2) and takes the form:

The marginal impact of AfTTOT on export product concentration, for each VAR variable, is given by:

$$\frac{\partial(EXPCONC)_{it}}{\partial(AfTTOT)_{it-2}} = \beta_2 + \beta_3 * VAR_{it} \quad (3)$$

Equation (3) indicates that the marginal impact of AfT on export product concentration depends on the level (or value) of the VAR variable in a given recipient country, as well as on the magnitude and statistical significance of the coefficients β_2 and β_3.

Incidentally, based on model (1), the total impact of total AfT on export product concentration is given by the expression $[\beta_2 * (AfTTOT) + \beta_3 * [(VAR_{it}) * (AfTTOT)_{it}]]$.

5. Interpretation of Empirical Results

Table 1 presents the outcome of the estimation of the different variants of model (1), including with the total AfT (percentage of GDP) as well as its components. Specifically, column [1] of this Table presents the estimates of the variant of model (1) where the AfT variable is AfTTOT. Columns [2] to [4] of this Table report the results of the estimation of the variant of model (1), where the AfT variable is respectively AfTINFRA, AfTPROD, and AfTPOL. In column [5], we display the outcome of the estimation of the specification of model (1), which contains all the three components of total AfT (percentage of GDP). Table 2 reports the outcome of the estimation of different specifications of model (1), including without and with the interaction variable (for each VAR considered). Thus, columns [1] to [4] provide the estimates associated with model (1) estimation with the interaction variable, and where the VAR variable is respectively DTP, FINPOL, FINDEV, and INST.

Before interpreting the estimates reported in the columns of these two Tables, it is important to discuss the outcome of the diagnostic tests that help check the validity of the two-step system GMM estimator. The results of these diagnostic tests are reported at the bottom of each column of Tables 1 and 2. It could be observed that the coefficient associated with the one-year lag of the EXPCONC variable is positive and statistically significant at the 1 per cent level, thereby suggesting that the EXPCONC variable exhibits a state dependence path. The p-values associated with the AR(1) are 0, whereas the p-values relating to AR(2) and AR(3) are higher than 0.10. Moreover, the p-values associated with the Sargan test are higher than 0.10. The number of instruments is consistently lower than the number of countries across all

columns of the two tables. Taken together, these results confirm that the two-step system GMM is an appropriate estimator to carry out the empirical analysis.

Let us now examine the results reported in Table 1. Results in column [1] indicate that total AfT inflows influence positively and significantly export product diversification in recipient countries. A 1 percentage point increase in total AfT (percentage of GDP) is associated with a 0.0074-point increase in the export product concentration index. Results over control variables indicate that higher education level, higher population size, and better governance and institutional quality drive positively export product diversification in AfT recipient-countries. Financial development appears to be positively associated with export product concentration, but the coefficient on the FINDEV variable is significant only at the 10 per cent level. Additionally, on average, trade policy liberalisation and financial openness do not influence export product concentration in AfT recipient countries.

Results also show that real per capita income (a proxy for the development level) is non-linearly associated with export product concentration. Indeed, the negative and significant coefficient on the real per capita income variable, and the positive and significant coefficient of the square term on real per capita income, confirm our theoretical expectations that in their first stages of development, countries tend to diversify their export products, but once real per capita income exceeds a certain threshold, countries tend to increase their specialisation, including their export product concentration. This threshold is given here by $US 1209360.5 [= exponential (0.100/0.00714)]. This threshold is far higher than the maximum value of real per capita income ($US 21507.96) in the entire sample. Therefore, we conclude that higher level of development is always associated with greater export product diversification. Estimates presented in columns [2] to [4] suggest that all the three components of total AfT exert a positive and significant impact on export product concentration in recipient countries. However, these different impacts may hide differentiated effects across countries in the sample.

Focusing on the results in column [5], we find that a 1 percentage point increase in AfT for economic infrastructure (percentage of GDP) leads to 0.0075-point increase in the export product concentration index. A 1 percentage point increase in AfT for productive capacity building (percentage of GDP) generates 0.0049-point increase in the export product concentration index; and a 1 percentage point increase in AfT flows allocated for trade policies and regulations (percentage of GDP) results in 0.004-point increase in the export product concentration index.

We now turn to the interpretation of results reported in columns [1] to [4] of Table 2. In each of these columns, we are particularly interested in the coefficient of the VAR variable as well as the interaction term associated with the interaction variable VAR*AfTTOT$_{t-2}$.

Does the impact of AfT on export product concentration (or diversification) depend on the degree of domestic trade policy liberalisation in recipient-countries?

Starting with column [1] where the VAR variable is DTP, we note that the coefficient relating to the variable $AfTTOT_{t-2}$ is positive and statistically significant at the 1 per cent level, whereas the coefficient of the interaction variable $DTP*AfTTOT_{t-2}$ is negative and statistically significant at the 1 per cent level. These signify that there is a threshold of DTP above which the total impact of AfT on export product concentration changes sign. In other words, the impact of AfT on export product concentration increases up to a threshold of trade policy, above which it becomes negative. This threshold is given by 80.7 (=0.0402/0.000498). It is worth recalling that the values of the DTP variable range from 0 to 89.2 (see Appendix 3). It then follows that, on average, countries whose trade policy levels are lower than 80.7 experience a positive impact of total AfT on export product concentration, while countries whose trade policy levels are lower than 80.7 experience a negative impact of total AfT on export product concentration, i.e. a positive impact of AfT on export product diversification. While these results provide a very good insight into the extent to which the impact of AfT on export product concentration (or export product diversification) could depend on the trade policy implemented by the recipient countries, they do not provide a complete picture on how this impact varies across all countries in the full sample. This is exactly what we present in Figure 1.

Figure 1: Marginal Impact of AfTTOT on EXPCONC, for varying levels of DTP

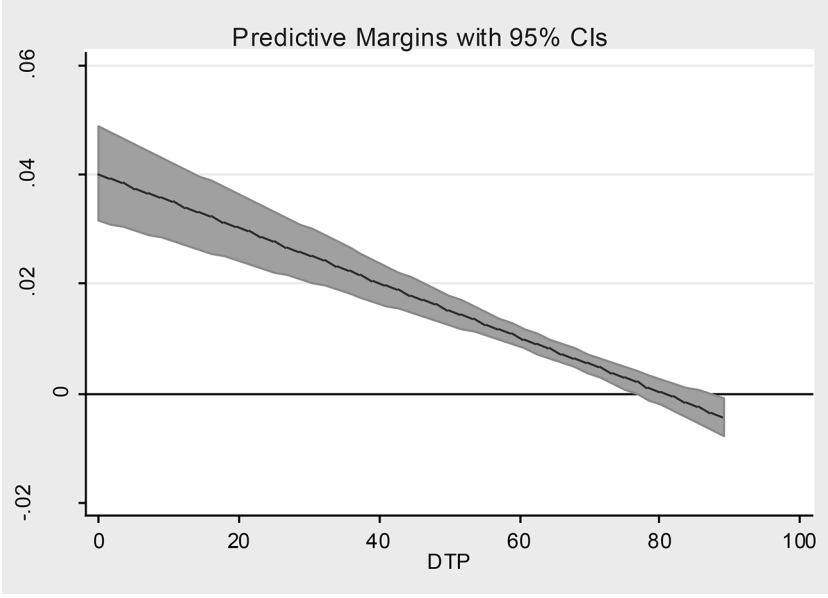


Figure 1 shows, at the 95 per cent confidence intervals, the evolution of the marginal effect of AfTTOT on EXPCONC for various levels of domestic trade policy (DTP). The statistically significant effects at the 95 per cent confidence intervals are those encompassing only the upper and lower bounds of the confidence interval that are either above or below the zero line. This graph suggests that the marginal impact of AfTTOT on EXPCONC takes both positive and negative values and decreases as countries further liberalise their domestic trade policies, i.e. as the values of the variable DTP increase. However, this marginal impact is statistically significant only for levels of the trade policy index lower than 76.7. Hence, countries with a level of domestic trade policy lower than 76.7 experience a positive and statistically significant impact of total AfT on export product concentration.

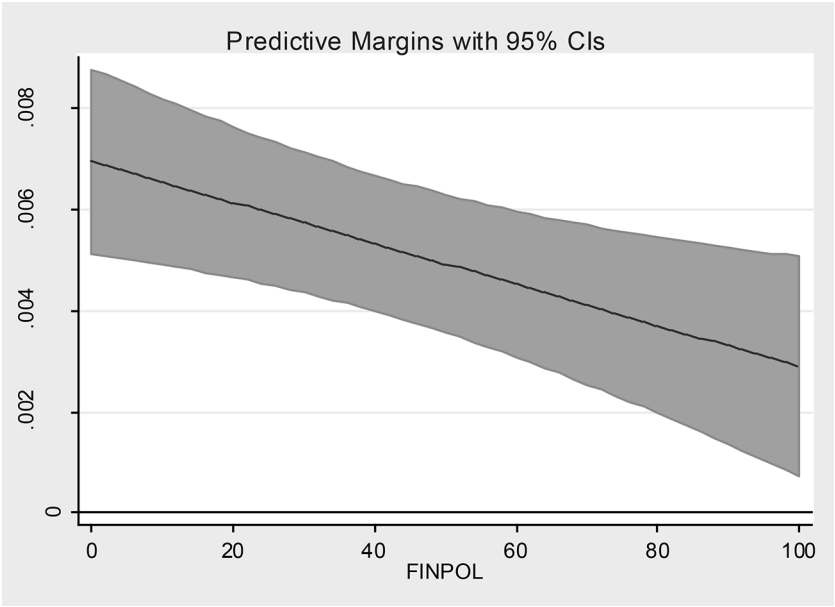
In addition, the higher the values of the DTP variable (i.e., the greater the degree of trade policy liberalisation) the lower is the impact of AfT on export product concentration. Put differently, the higher the trade policy liberalisation degree (as far as it is comprised between 0 and 76.7), the higher the impact of AfT on export product diversification. Incidentally, countries with a degree of trade policy liberalisation between 70.7 and 87.4 experience no significant impact of total AfT on export product concentration. Finally, countries whose levels of trade policy liberalisation is higher than (or equal to) 87.4 experience a negative and significant impact of AfT on export product concentration (or a positive impact of AfT on export product diversification). Overall, a key policy message conveyed by Figure 1 is that the greater the degree of trade policy liberalisation, the higher is the positive impact of total AfT on export product diversification.

Does the impact of AfT on export product concentration (or diversification) depend on the level of financial openness in recipient-countries?

Turning to results in column [2] where the VAR variable is FINPOL, we note that the coefficient relating to the variable $AfTTOT_{t-2}$ is positive and statistically significant at the 1 per cent level, whereas the coefficient of the interaction variable FINPOL*$AfTTOT_{t-2}$ is negative but not statistically significant at the 10 per cent level. This tends to indicate that AfT almost always exerts a positive impact on export product concentration. However, as we have seen above, this conclusion may be misleading, because the results provide an 'average' effect across the full sample. A better picture of the impact of total AfT flows on export product concentration for various levels of FINPOL is provided in Figure 2.

Figure 2 presents a pattern similar to that in Figure 1. It shows, at the 95 per cent confidence intervals, how the marginal effect of AfTTOT on EXPCONC evolves for various levels of financial policy (FINPOL). It can be observed from this graph that the marginal impact of AfTTOT on EXPCONC is always positive and statistically significant, and declines as governments open up their economies further to international capital flows. In other words, the greater the level of financial openness, the lower is the impact of total AfT on export product

Figure 2: Marginal Impact of AfTTOT on EXPCONC, for varying levels of FINPOL



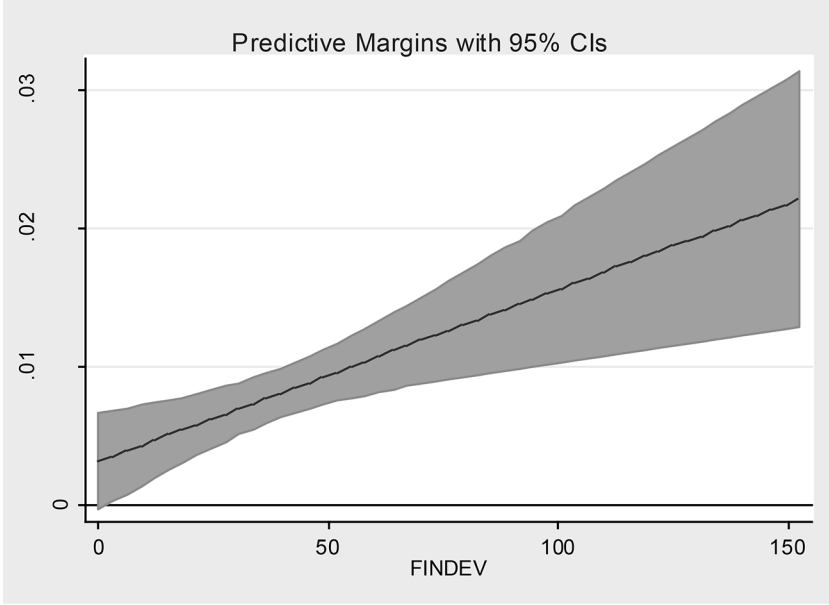
concentration. Overall, this graph suggests countries that open up their capital account experience a positive impact of AfT on export product concentration, but the magnitude of this positive impact decreases as countries increase their degree of capital account openness. In other words, as countries further open up their capital account, they tend to diversify much more their export product basket.

Does the impact of AfT on export product concentration (or diversification) depend on the level of financial development in recipient-countries?

We now consider the case where the VAR variable is measured by the level of financial development (FINDEV) in a recipient-country (see column [3]). The coefficient associated with the variable $AfTTOT_{t-2}$ is positive and statistically significant at the 1 per cent level, and the interaction term relating to the interaction variable $FINDEV*AfTTOT_{t-2}$ is also positive, and statistically significant at the 5 per cent level. Taken together, these two results indicate that as countries further develop their domestic financial markets, they experience an increasing positive impact of total AfT on export product concentration.

Figure 3 shows, at the 95 per cent confidence intervals, how the marginal effect of AfTTOT on EXPCONC evolves for various levels of financial development (i.e., for various values of FINDEV). This Figure shows a pattern opposite those

Figure 3: Marginal Impact of AfTTOT on EXPCONC, for varying levels of FINDEV



observed in Figures 1 and 2. Specifically, this marginal effect is almost always statistically significant, and increases as countries experience greater financial development. It is statistically insignificant only for very low financial development levels, i.e. strictly lower than 3.05 percentage (of GDP). Thus, countries with a depth of financial development lower than 3.05 percentage of GDP, experience no significant impact of AfT on export product concentration (or diversification). However, when the level of financial development exceeds this threshold, countries experience a positive and significant impact of total AfT on export product concentration, and the higher (lower) the degree of financial development, the higher (lower) the positive impact of AfT on export product concentration (export product diversification).

Does the impact of AfT on export product concentration (or diversification) depend on the level of governance and institutional quality in recipient-countries?

Last but not least, we consider the case where the variable VAR is represented by the degree of quality of governance and institutions (see results in column [4]). It is worth recalling that higher values of the INST index indicate better governance and institutional quality. These values range from –4.268 to 3.083 in the sample. We observe in column [5] that the coefficient relating to the variable $AfTTOT_{t-2}$ is positive and statistically significant at the 1 per cent level,

while the coefficient of the interaction variable INST*AfTTOT$_{t-2}$ is negative but not statistically significant at the 10 per cent level. Therefore we conclude that, on average, the impact of total AfT on export product concentration does not depend on recipient countries' levels of governance and institutional quality. However, as with previous cases, a graphical representation on the evolution of the marginal impact of AfTTOT on EXPCONC, for various levels of institutional and governance quality (i.e. for various values of the variable INST) would provide a better picture on the link between AfT, governance and institutional quality and export product concentration.

Figure 4: Marginal Impact of AfTTOT on EXPCONC, for varying levels of INST

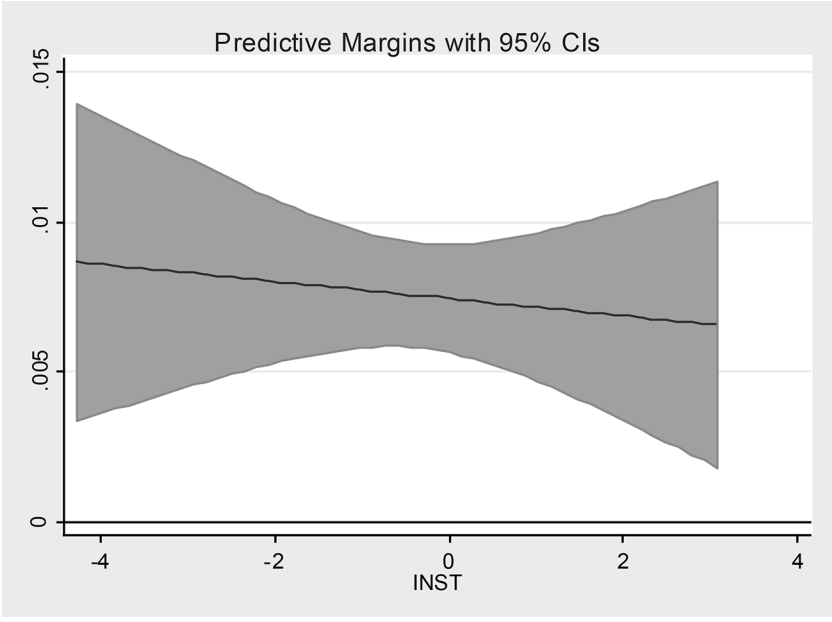


Figure 4 displays this, at the 95 per cent confidence intervals. It shows that the marginal impact of total AfT on export product concentration is always positive and statistically significant, and decreases as countries experience higher levels of institutional and governance quality. This signifies that as countries further improve their institutional and governance quality, they reduce their degree of export product concentration, and hence, further diversify their export product basket.

6. Conclusions

Several studies have examined the impact of AfT on the export performance of recipient countries, but few studies have investigated the influence of AfT on

recipient countries' export product diversification. The current paper contributes to the strand of the literature on the impact of AfT on export upgrading by investigating whether the impact of AfT on export product concentration (or diversification) depends on the structural economic policies implemented by recipient-countries. We consider as structural economic policies, long term policies that could influence countries' export product diversification path. These include trade policy, international financial policy and domestic financial development. We additionally consider the extent to which the impact of AfT flows on export product diversification depends on the level of institutional and governance quality.

The analysis covers 112 AfT-recipient countries over the period 2002–2015, and is carried out using the two-step system GMM approach. The empirical results suggest that as countries improve their institutional and governance quality, or further liberalise their trade regimes, or further open up their capital account, they enjoy a greater positive impact of AfT flows on export product diversification. Countries with higher depth of financial development experience a positive impact of AfT on export product concentration.

We recognise that a limitation of the current study is the timespan of available data. Indeed, as AfT disbursements data are available only from 2002, our panel dataset covers the period 2002–2015, just 14 years. Given that it may take time for countries to diversify their export product baskets, a longer timespan would have helped measure more accurately the impact of AfT on export product diversification. However, we believe that the current study that relies on 14 years still provides very good *prima facie* evidence of the extent to which the impact of AfT on export product diversification depends on countries' structural economic policies. Therefore, a future avenue for research could be to carry out the exercise conducted in this study over a longer time-period when AfT data would allow to do so. Another future avenue for research could be to undertake a full-length analysis on the extent to which the impact of AfT on export product diversification depends on the available human capital stock.

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Appendix 1

Variables – Definitions and sources

EXPCONC	**Definition:** This is the Export Product Concentration Index. It is calculated using the Herfindahl-Hirschmann Index and its values are normalised so that they range between 0 and 1. An index value closer to 1 indicates a country's exports or imports are highly concentrated on a few products. On the other hand, values closer to 0 reflect exports or imports are more homogeneously distributed among a series of products. **Source:** UNCTAD Database. See online: http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx
AfTTOT	**Definition:** Total Aid for Trade Gross Disbursements, in percentage of GDP **Source:** Author's Calculation based on data extracted from the OECD/DAC-CRS (Organisation for Economic Cooperation and Development/Donor Assistance Committee)-Credit Reporting System (CRS). Hence, AfT data are computed on the basis the OECD/DAC-CRS database and cover the following three categories (the CRS Codes are in brackets): Economic Infrastructure: transport and storage (210), communications (220), and energy generation and supply (230); Building Productive Capacity: 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 Trade policy and regulations: trade policy and regulations and trade-related adjustment (331). To calculate the ratio of AfT to GDP, we use GDP, Current US$, from the World Development Indicators (WDI).
AfTINFRA	**Definition:** Gross Disbursements of Aid for Trade allocated to economic infrastructure, in percentage of GDP **Source:** Author's Calculation based on data extracted from the OECD/DAC-CRS. AfT for economic infrastructure includes (the CRS Codes are in brackets): Transport and storage (210), communications (220), and energy generation and supply (230). To calculate the ratio of AfT for economic infrastructure to GDP, we use GDP, Current US$, from the WDI.
AfTPROD	**Definition:** Gross Disbursements of Aid for Trade allocated to productive capacity building, in percentage of GDP **Source:** Author's Calculation based on data extracted from the OECD/DAC-CRS. AfT for productive capacity building includes (the CRS Codes are in brackets): 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). To calculate the ratio of AfT for productive capacity building to GDP, we use GDP, Current US$, from the WDI.
AfTPOL	**Definition:** Gross Disbursements of Aid for Trade allocated to trade policies and regulations, in percentage of GDP **Source:** Author's Calculation based on data extracted from the OECD/DAC-CRS. AfT for productive capacity building includes (the CRS Codes are in

	brackets): trade policy and regulations and trade-related adjustment (331). To calculate the ratio of AfT for trade policies and regulations to GDP, we use GDP, in current US$, from the WDI.
DTP	**Definition:** Trade Policy of the domestic economy = Trade Freedom Score. This is a component of the Economic Freedom Index. It is composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services. Its computation is based on two components: trade-weighted average tariff rage and non-tariff barriers (NTBs), the extent of latter having been determined on the basis of quantitative and qualitative available information. NTBs include quantity restrictions, price restrictions, regulatory restrictions, investment restrictions, customs restrictions, and direct government interventions. This score is graded on a scale of 0 to 100, with a rise indicating lower trade barriers, i.e., higher trade liberalisation, while a decrease reflects rising trade protectionism. **Source:** Heritage Foundation (see Miller *et al* 2017)
GDPC	**Definition:** GDP per capita (constant 2010 US$) **Source:** WDI
FINPOL	**Definition:** This is the index of financial policy. It is measured by the Chinn-Ito Index, which is a *de jure* measure of financial openness. Higher scores of this index refer to higher financial openness, whereas lower scores indicate lower financial openness. Note that the index ranges from 0 to 1. We multiply it by 100 so as to allow it to range from 0 to 100. This is to ensure consistency with the TP index presented just above. **Source:** Data extracted from the database developed by Chinn and Ito (2006). Data were updated to 2015 by the Authors on 20 July 2017. See data online at: http://web.pdx.edu/~ito/Chinn-Ito_website.htm
FINDEV	**Definition:** Domestic credit to private sector by banks (percentage of GDP) **Source:** WDI 2017
EDU	**Definition:** Gross secondary school enrolment rate, (percentage) **Source:** WDI 2017
POP	**Definition:** Total population **Source:** WDI 2017
INST	**Definition:** This is the variable capturing institutional 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 are respectively denoted 'VoiceAcc', 'PolStab', 'RegQual', 'Rulelaw', 'GovEff' and 'Cor'. 'VoiceAcc' is the measure of Voice and Accountability. It represents the 'PolStab' is the measure of political stability and absence of violence/ terrorism. It reflects perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. 'RegQual' stands for Regulatory Quality index. This index reflects perceptions of the ability of the government to formulate and implement

sound policies and regulations that permit and promote private sector development.

'Rulelaw' represents the Rule of Law index and reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

'GovEff' is the Government Effectiveness index and reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

'Cor' is the index of corruption. It reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests.

It is worth noting that the values of each of these indicators oscillate range from – 2.5 to 2.5, with the lower values being associated with 'worse' governance and institutional quality, and the higher values being associated with 'better' governance and institutional quality.

Source: Data on the components of 'INST' variables has been collected from World Bank Governance Indicators developed by Kaufmann *et al* (2010) and recently updated.

Appendix 2

List of countries contained in the Sample of Aid for Trade Recipients (Analysis carried out over the period 2002–2015)

Albania	Cote d'Ivoire	Lao PDR	Philippines
Algeria	Croatia	Lebanon	Rwanda
Angola	Djibouti	Lesotho	Samoa
Argentina	Dominica	Liberia	Sao Tome and Principe
Armenia	Dominican Republic	Macedonia, FYR	Saudi Arabia
Bangladesh	Ecuador	Madagascar	Senegal
Barbados	Egypt, Arab Rep.	Malawi	Seychelles
Belarus	El Salvador	Malaysia	Sierra Leone
Belize	Equatorial Guinea	Mali	Solomon Islands
Benin	Eritrea	Mauritania	South Africa
Bhutan	Ethiopia	Mauritius	Sri Lanka
Bolivia	Fiji	Mexico	St. Lucia
Botswana	Gambia, The	Moldova	St. Vincent and the Grenadines
Brazil	Georgia	Mongolia	Suriname
Burkina Faso	Ghana	Morocco	Swaziland
Burundi	Guatemala	Mozambique	Tajikistan
Cabo Verde	Guinea	Myanmar	Tanzania
Cambodia	Guinea-Bissau	Namibia	Thailand
Cameroon	Guyana	Nepal	Togo
Central African Republic	Honduras	Nicaragua	Tonga

Chad	India	Niger	Trinidad and Tobago
Chile	Indonesia	Nigeria	Tunisia
China	Iran, Islamic Rep.	Oman	Turkey
Colombia	Jamaica	Pakistan	Uganda
Comoros	Jordan	Panama	Ukraine
Congo, Dem. Rep.	Kazakhstan	Papua New Guinea	Uruguay
Congo, Rep.	Kenya	Paraguay	Venezuela, RB
Costa Rica	Kyrgyz Republic	Peru	Yemen, Rep.

Appendix 3

Standard descriptive Statistics on the variables used in the analysis over the sample of AfT-Recipient countries

Variable	*Observations*	*Mean*	*Standard deviation*	*Minimum*	*Maximum*
EXPCONC	1,559	0.362	0.204	0.069	0.966
AfTTOT	1,526	1.206	1.481	0.000032	11.019
AfTINFRA	1,513	0.673	1.024	0.000021	10.644
AfTPROD	1,525	0.516	0.644	0.000032	4.397
AfTPOL	1,358	0.025	0.094	–0.019	2.725
GDPC	1,561	4044.96	4308.097	193.867	21507.96
DTP	1,461	67.995	12.027	0	89.2
EDU	1,160	67.473	26.95	6.862	129
FINDEV	1,535	32.209	24.646	0.0009	152.5
FINPOL	1,565	41.683	33.83	0	100
POP	1,564	4.65e+07	1.70e+08	69824	1.37e+09
INST	1,567	–1.012	1.440	–4.26	3.083

Endnote

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