Is Aid for Trade Effective? A Panel-Quantile Regression Approach

by

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Abstract

This paper investigates whether Aid for Trade (AfT) leads to greater exports in recipient countries. Using panel data and panel quantile regression, our results suggest that overall AfT disbursements promote the export of goods and services in the short and in the long run, but mainly for the lower quantiles (0.1; 0.25; 0.50) of the conditional distribution of exports. This effect essentially vanishes at the higher tail of the distribution. Hence, countries that export less in volume are those benefitting most from AfT. We also investigate which types of AfT are effective. Aid to improve trade policy and regulation is associated with higher exports for all quantiles, with the effect increasing at the higher end of the distribution. Aid to build productive capacity is effective for the lower quantiles of the export distribution, with the effect decreasing at the upper tail of the conditional distribution. Aid used to build infrastructure is found to affect exports at only the lowest tail of the distribution. In contrast, aid disbursed for general budget support (an untargeted type of aid) is not associated with greater export levels. This finding holds true irrespective of the quantile.

Key Words: development aid; North-South trade; aid for trade; panel data; aid effectiveness
JEL Codes: F14, F35, O10, C22, C23

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1. Introduction

Aid for Trade (AfT) became a buzz word in aid policy only a few years ago, but is far from being a new concept in development policy (Evenett, 2009). Dating back to the 1986-1994 Uruguay Round, developing countries began demanding financial compensation for concessions made in trade liberalization negotiations[2] as well as an increase in development aid to help facilitate integration into the world trading system. Aid that serves the latter objective is usually considered AfT. As trade liberalization negotiations became more difficult in the late 1990s and early 2000s given that the "easier" concessions had already been made on both sides (developed and developing countries), WTO members separated the AfT initiative from the Doha Round negotiations and established a WTO 'Aid for Trade Task Force' in July 2006. According to the WTO task force on AfT, *"[AfT] is about assisting developing countries to increase exports of goods and services, to integrate into the multilateral trading system, and to benefit from liberalised trade and increased market access. Effective [AfT] will enhance growth prospects and reduce poverty, as well as complement multilateral trade reforms and distribute the global benefits more equitably across and within developing countries."* (Cited in OECD/WTO, 2011: 9.)

In essence, the objectives of the AfT initiative were to promote growth and development through trade across developing countries, especially in the least developed countries (LDCs); and through their integration into the world trading system. This was to be achieved through more trade-related infrastructure, an improved production capacity and by supporting

[2] Compensation payments for trade liberalization were the original type of AfT.

negotiations concerning trade policy regulation and trade liberalization. As AfT is considered an important instrument of development aid, the European Union, the United States, and Japan made non-binding concessions to increase AfT disbursements. However, the means for AfT have not increased substantially (García, 2008; Luke, 2009; Huchet-Bourdon et al., 2009; Karingi, 2009). In the period from 2002 to 2009, AfT ranged from only 20 to 30% of total official development assistance (ODA). While AfT increased during these years, other types of aid increased even faster (Karingi, 2009). In Africa, the AfT share shrank from 29% in 2002 to 21% in 2006. In real terms, 2010 AfT commitments were extremely high at US$ 48 billion, declining by 14 percent to US$ 41 billion in 2011. Meanwhile, AfT disbursements were less affected by the 2011 decline in ODA; disbursements declined only by 3.7% to US$ 33.5 billion (see Figure A.1).

In recent years, development economists have become more aware of the challenges of overall ODA in promoting trade and economic growth in developing countries (Doucouliagos and Paldam, 2008; Rajan and Subramanian, 2008; Nowak-Lehmann D. et al., 2012; Nowak-Lehmann D. et al., 2013). Many existing studies find that ODA is ineffective, in that it produces no significant impact on per capita income and recipient country exports. However, these studies fail to differentiate[3] among different types of aid, such as: AfT, technical assistance, humanitarian aid, sector-specific aid, etc. This could explain why the authors were unable to find a positive impact of aid.

Given the objectives of AfT, our question remains: Is AfT effective? In particular, we investigate whether AfT is associated with higher exports of goods and services in the short and longer run. To the best of our knowledge, the existing literature on AfT-effectiveness is scarce, as pointed out by Vijil and Wagner (2012), and most of the work consists of case studies at the country level.

[3] Rajan and Subramanian (2009) investigated different types of aid but could not establish significant differences between these types.

The effectiveness of AfT is currently assessed using one of two approaches. The first approach investigates whether AfT reduces the cost of trading or other impediments to trade. Calì and te Velde (2011) and Busse et al. (2011) find that aid for infrastructure and aid for trade facilitation lower transport costs and thus promote exports. The second approach, which is used in this paper, analyses whether AfT is associated directly with improved export performance (measured by the value of exports of goods and services). Most existing studies have found a positive relationship between AfT or some of its components, and trade-related outcomes. Among these studies, Bearce et al. (2013) find that AfT issued by the US government has a positive effect on the recipient country's export performance; Vijil and Wagner (2012) suggest that aid to trade-related infrastructure[4], as part of overall AfT, has a positive impact on exports as a ratio to GDP; and Calì and Te Velde (2011: 725) find that AfT has an overall positive and significant effect on exports which is driven by AfT for economic infrastructure and this type of AfT also lowers trade costs. Both Vijil and Wagner (2012) and Calì and Te Velde (2011) emphasize that the infrastructure channel is the main driver of AfT effectiveness. However, Helble, Mann and Wilson (2012) find that aid for trade policy and regulations (which is another AfT category) is also effective. The authors find that a 1% increase in aid for trade policy and regulation increases trade volume by around US$ 347 million. Hühne et al. (2014) have investigated the impact of AfT on both donor and recipient countries. Regarding recipient countries, they find total AfT and its components (infrastructure-related aid, aid for building and improving productive capacity and aid for trade policy and regulation) to be all effective. However, when splitting the sample into groups, by income and region, the results become mixed. AfT tends to favour the richer developing countries and countries in Asia and Latin America.

The main contribution of this paper to the existing literature is the use of a methodology, panel-quantile regression, which allows us to investigate whether AfT has different effects along

[4] Through this paper, we refer to this type of aid as “aid for economic infrastructure”.

the conditional distribution of exports. More specifically, we study whether AfT goes to countries that possess certain export disadvantages and therefore have a weaker export capacity, rather than to countries with a stronger export performance. Being able to answer this question is extremely relevant as it would allow to better target AfT funds according to the export capacity and AfT-efficiency in the recipient countries. Secondly, we distinguish in the panel quantile regressions between short-run and longer run effects of AfT and control for autocorrelation via the Feasible Generalized Least Squares technique (FGLS) and for endogeneity via an altered, but simplified Dynamic Ordinary Least Squares (DOLS) technique.

The main results show that total AfT disbursements promote exports of goods and services in the long run mainly for the lower quantiles of the conditional distribution of exports. Hence, countries that export less also benefit more than other countries from AfT. In particular, aid used to improve trade policy and trade regulation and aid to build production capacity are found to be effective. AfT to improve trade policy and regulation is effective for all quantiles of the export distribution in the long run, whereas it is ineffective in the short run for all quantiles. AfT for building productive capacity is effective for the 0.1, 0.25 and 0.50 quantiles of the export distribution. Also, aid used to build infrastructure is found to positively affect exports for the 0.1 quantile of the distribution. This is good news as it proves aid effectiveness for the more disadvantaged countries that are more in need of infrastructure, too. In contrast, aid disbursed to general budget support (for comparison), which is considered as an untargeted component of development aid, is not associated with higher exports. It even has a negative contribution on export expansion. This holds true irrespective of the quantile.

The rest of the paper proceeds as follows. Section 2 presents the empirical model that we use to analyse AfT effectiveness. Section 3 discusses the variables, data and descriptive statistics. Regression results are presented and evaluated in Section 4, and Section 5 concludes.

2. Empirical Model

2.1 Baseline model

As a framework for analysis, we estimate the model proposed by Calì and Te Velde (2011) using the most recent AfT data. The authors identify the types of AfT that can help address governance failures in developing countries by associating the main aid categories, as classified by the OECD statistics, with a number of goals that are related to trade performance, e.g. aid for trade policy and regulations should improve weak institutions. They also refer to the complexity of the economic channels through which AfT affects export performance. This includes Dutch disease effects as well as direct and indirect competitiveness effects. The authors claim, however, that causality is less complex than for the aid-economic growth link. The OECD distinguishes between five categories of AfT: (1) technical assistance for trade policy and regulations (e.g. helping countries develop trade strategies, negotiating trade agreements and implementing their outcomes); (2) trade-related infrastructure (e.g. building roads, ports and telecommunication networks to connect domestic markets to the global economy); (3) productive capacity building, including trade development (e.g. supporting the private sector exploit their comparative advantages and diversify their exports); (4) trade related adjustments (e.g. helping developing countries finance the costs associated with trade liberalization, such as tariff reductions, preference erosion, or declining terms of trade) and (5) other trade-related needs, if identified as trade-related development priorities in partner countries' national development strategies (OECD, 2014). For reasons of data availability, we limit our analysis to the first three categories of AfT.

The empirical model used to analyse AfT effectiveness is an export demand equation augmented with aid for trade variables and is given by,

$$Exp_{it} = \beta_0 + \sum_k \beta_k X_{kit} + \sum_l \beta_l D_{lt} + \varepsilon_{it} \qquad (1)$$

where Exp_{it} denotes exports of country *i* in year *t*, X_{kit} variables are explanatory variables (AfT and a number of control variables), D_{lt} are time dummies and $\mathcal{E}_{it}$ is the error term. However with a *(pooled) OLS regression* as in (1) we are not controlling for country-specific unobserved heterogeneity. To capture these unobserved effects, the model is specified as,

$$Exp_{it} = \beta_0 + \sum_k \beta_k X_{kit} + \sum_l \beta_l D_{lt} + \alpha_i + \varepsilon_{it} \qquad (2)$$

where α_i denotes country-specific unobserved heterogeneity, and ε_{it} is the error term. The unobserved effect α_i is country-specific and time-invariant and can be treated as *fixed* or *random* to fit the model. The baseline is the following static unobserved effects model,

$$\ln(Exp_{it}) = \beta_0 + \beta_1 POP_{it} + \beta_2 \ln(MP_{it}) + \beta_3 GE_{it} + \beta_4 \ln(CPI_{it}) + \sum_h \beta_h \ln(AfT_{hit-x}) + \qquad (3)$$
$$\sum_l \beta_l D_{lt} + \alpha_i + \varepsilon_{it}$$

in which ln denotes natural logs. We regress exports (Exp_{it}) on lagged proxies for AfT (AfT_{hit-x}) while controlling for population size (POP_{it}), market potential (MP_{it}), government effectiveness (GE_{it}) and the consumer price index (CPI_{it}). Furthermore, time dummies (D_{lt}) and the country-unobserved effects (α_i) are included.

Model (3) is a generalized version of the model used by Calì and Te Velde (2011: 730). The main differences are twofold. First, we use exports of goods and services as a dependent variable, whereas the authors use merchandise exports. Second, the authors use only two proxies of AfT, while we consider three.

The reasons for our choice of dependent and explanatory variables are as follow. First, there is no reason to limit the scope of analysis to merchandise exports. Service exports, for example, could also be fostered by AfT. AfT is neither aimed at merchandise exports only nor

would we expect the export performance of service sectors to be unaffected by AfT.[5] Consequently, we use *exports of goods and services* as the dependent variable in our regressions. Second, when analysing the effect of AfT on exports, a specific measure of AfT must be selected (i.e. selecting which AfT categories to include in the estimations). Calì and Te Velde (2011) use only aid disbursed for economic infrastructure (CRS category 200) and aid disbursed to production capacity (CRS category 300). In contrast to their study, we make use of three AfT proxies: aid to trade policies and regulation (*TPR*), aid to economic infrastructure (*EI*) and aid to building production capacity (*BPC*). Our choice of AfT proxies allows us to be more specific and is explained in Table A3.

To put our results into perspective, we compare the impact of AfT with the impact of aid to general budget support (*GBS*), which might be used by recipients for trade development but which is not counted as AfT. Lastly, we experiment with three alternative measures of market potential. The concept of market potential dates back to Harris (1954). Calì and Te Velde (2011: 730) calculate the market potential[6] of country *i* at time *t* as the sum of the (inverse) bilateral distance (d_{ij}) weighted GDPs of *all* other countries, i.e.

$$MP_{it} = \sum_{j} \frac{GDP_{jt}}{d_{ij}} \tag{4}$$

Generally, as explained in Overman, Redding and Venables (2001: 12), market potentials can also be computed as:

$$MP_{\gamma it} = \sum_{j} GDP_{jt}\, d_{ij}^{\gamma} \tag{5}$$

where γ serves as a "distance weighting parameter". By varying the size of the distance weighting parameter, we obtain different measures of market potential:

[5] Aid for economic infrastructure (which is part of overall AfT and is, among others, used to build roads and ports), may have an impact on the tourism sector (which, especially in developing countries, may account for a substantial portion of total exports).

[6] Note that the market potential of country *i* at time *t* is calculated as the sum of the (inverse) bilateral distance weighted GDPs of *all* other countries and *not only* of all countries for which we analyse the effect of AfT on exports - which are, of course, mostly developing countries.

$$MP1 = MP_{it}(\gamma = -1) = \sum_j \frac{GDP_{jt}}{d_{ij}}$$

$$MP2 = MP_{it}(\gamma = -0.5) = \sum_j \frac{GDP_{jt}}{\sqrt{d_{ij}}}$$

$$MP3 = MP_{it}(\gamma = -2) = \sum_j \frac{GDP_{jt}}{d_{ij}^2} \quad (6)$$

Note that we would expect greater market potential to be (ceteris paribus) associated with higher exports.

2.2 Quantile regression model

A novel specification considered in this paper is the application of a quantile regression for panel data. Recently, Canay (2011) proposed a simple transformation to exclude fixed effects, assuming that these effects are location shifters. The author proposes a two-step approach that consists of estimating country fixed effects (FE) using a within FE model in a first step. In a second step the consistently estimated FE are used to demean the dependent variable (log of exports) and this transformed variable is taken as a dependent variable in a quantile regression.

The model estimated in the first step is given by equation (3) above. Then, the estimated α_i are used to transform ln (Exp_{it}) into $\widetilde{X}_{it} = \ln(EXP_{it}) - \hat{\alpha}_i$.

The quantile regression is estimated as,

$$\hat{\beta}(\tau) = \arg\min_{\beta \in \Theta} (nT)^{-1} \sum_{T=1}^{T} \sum_{i=1}^{n} \rho_\tau (\widetilde{X}_{it} - X'_{it}\beta) \quad \textbf{(7)}$$

3. Variables, Data and Descriptive Statistics

In this section, we discuss the data and present variable descriptions and sources, as well as descriptive statistics. The panel dataset used in our empirical analysis covers the period from 2000 to 2011 and comprises 162 countries (see Table A.1 in the Appendix).[7] Figure A.2 shows the regional distribution. It is worth noting that 19 percent of the countries are landlocked. Limited data availability influenced the time and country dimensions of the panel. Data coverage on AfT—our key explanatory variable—for the years before 2000 is incomplete.

Table A.2 presents a description of the variables used in the analysis, the corresponding abbreviations, and the sources of the data. Data on AfT —our key explanatory variable— stems from the Creditor Reporting System (CRS) (OECD, 2013a).[8] According to the OECD (2013b), "[t]he objective of the CRS Aid Activity database is to provide (…) data that enables analysis on where aid goes, what purposes it serves and what policies it aims to implement (…)." Data on commitments and disbursements of official development assistance (ODA) is available by sector, policy objective, type of aid and purpose code. We use data on disbursements of ODA (in constant 2011 US$) by sector for the 162 countries included in our analysis for the 2002-2011 period. Using data on ODA by sector, we calculated AfT proxies as illustrated in Table A.3.

Data on the export of goods and services (in constant 2005 US$) is from the World Bank's World Development Indicators (WDI) database (World Bank, 2013a). From the same database, we obtained data on *Population* (in millions) and data on the *CPI* (with 2005 as the base year). Data on GDP (in constant 2005 US$), which we need to compute market potentials, also comes from the WDI database. Data on bilateral distances—which, as explained in Section

[7] While data on AfT is available for 179 countries, there are only 168 countries for which we have data on both AfT and exports, our dependent variable. For six of these 168 countries, we are not able to calculate market potentials—an important control variable—because data on bilateral distances is missing. We confine the analysis ex ante to those 162 countries for which data on exports, AfT and bilateral distances (market potentials) are available (which does not mean that the data for these 162 countries is complete).

[8] The CRS database is maintained by the Development Assistance Committee (DAC), which is part of the OECDs Development Co-operation Directorate (DCD).

2, is also needed to calculate market potentials—stems from CEPII (2013a/b). Data on government effectiveness (*GE*), which is another important control variable in our baseline model, comes from the Worldwide Governance Indicators (WGI) project (World Bank, 2013b). *GE* indicates the strength of governance performance. Finally, data on the strength of legal rights index (*SOLR*), which "measures the degree to which (...) laws protect the rights of borrowers and lenders and thus facilitate lending" (World Bank, 2013a), comes from the WDI database (World Bank, 2013a). The *SOLR* dataset is not part of our baseline model (see Section 2), but is used as an alternative to the government effectiveness (*GE*) index in some regressions.

Table 1 contains summary statistics of the main variables used in the empirical analysis. The first part of Table 1 contains summary statistics for the AfT proxies. For each proxy, commitment and disbursement data is available. Proxies for "total" AfT commitments (*C_TOTAL*) and "total" AfT disbursements (*D_TOTAL*) are calculated as the sum of the proxies for commitments and disbursements, respectively.

Table 1: *Summary statistics for the AfT-proxies, dependent variable and controls*

Target Variables	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Commitments					
C_TPR	1312	4.631	17.779	0.000	461.053
C_EI	1662	142.824	317.260	0.000	4264.45
C_BPC	1684	58.618	119.746	0.000	1926.927
C_TOTAL	1699	201.391	409.525	0.000	5375.200
C_GBS	810	87.058	159.957	0.00	1730.520
Disbursements					
D_TPR	1204	3.360	15.781	0.000	403.724
D_EI	1404	103.006	217.144	0.006	2386.488
D_BPC	1415	44.714	80.960	0.003	775.843
D_TOTAL	1425	148.7273	288.606	0.003	3042.281
D_GBS	742	70.240	122.008	0.00	1066.810
Dependent Variable					
Exports	1228	29051.210	108752.000	15.785	1677840.000
Control Variables					
Population	1788	35.552	142.991	0.009	1344.130

MP1	1728	7907.086	3447.210	3291.178	24758.810
GE	1628	-0.464	0.679	-2.454	1.590
CPI	1562	296.858	7418.968	0.288	293318.000
MP2	1728	558266.100	103877.000	354308.800	966380.700
MP3	1728	4.273	8.793	0.329	93.052
SOLR	1075	4.805	2.342	0	10

Notes: *C_TOTAL is calculated as the sum of C_TPR, C_EI and, C_BPC. If data on some of the four components was missing, C_TOTAL was calculated as the sum of the others. In essence, when calculating the sum over all corresponding proxies, missing values were set equal to 0 as long as not all values were missing. Similarly for D_TOTAL, values are in constant 2011 US$ millions. Exports = exports of goods and services (constant 2005 US$ millions). Population = total population (in millions). MP1 = market potential (with simple distances). GE = government effectiveness (-2.5 = weak to 2.5 = strong government performance). CPI = consumer price index (2005 = 100). MP2/3 = market potential 2/3 (with square root/squared distances). SOLR = strength of legal rights index (0 = weak to 10 = strong). Also see Table 2.*

In what follows, we discuss the data of our AfT-proxies in detail.[9] Descriptive statistics for all other variables will be presented thereafter. First, note that the number of observations for AfT commitments is significantly larger than for AfT disbursements (see Table 1). This is mostly due to the fact that data on disbursements is completely missing for the years before 2002 (e.g. in our case, for 2000 and for 2001).

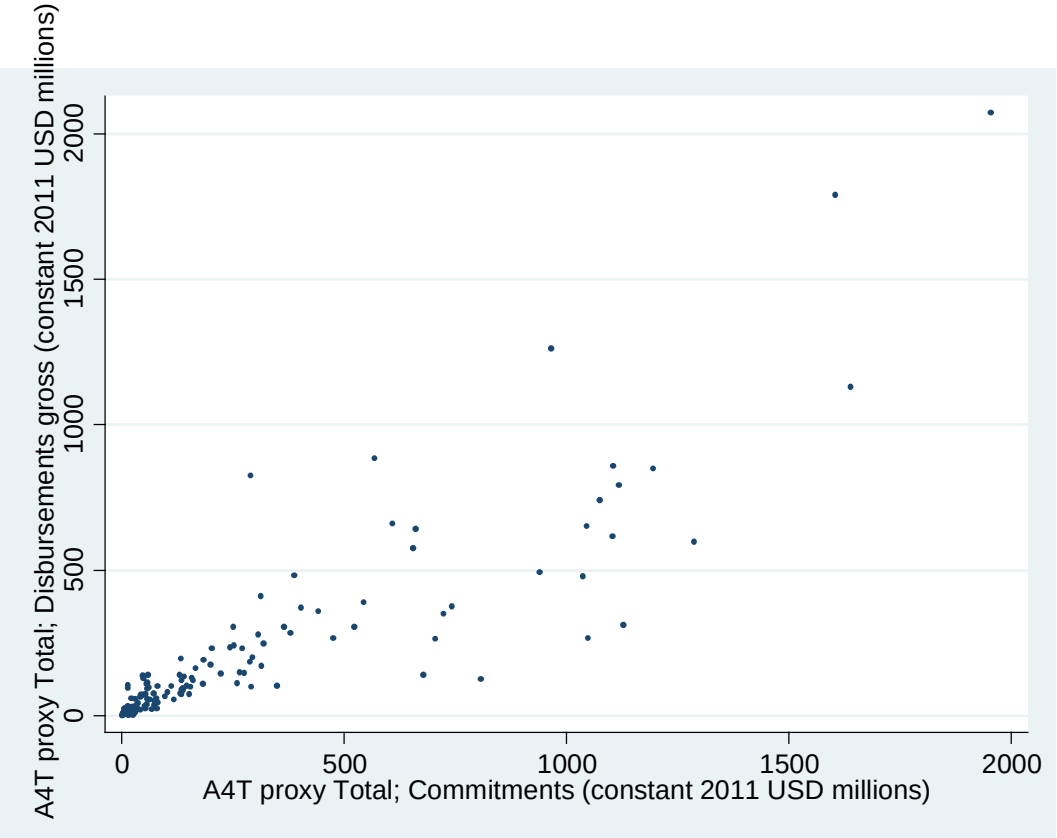
Second, the average size of AfT commitments and disbursements is notable. The mean value of AfT commitments for economic infrastructure (*C_EI*), which is the average value per country and year, is about US$ 142 million. The fact that AfT is quite sizeable can best be seen when expressed relative to GDP. The ratio of the sum of all AfT proxies (*C_TOTAL* or *D_TOTAL*) to GDP has a median value of 1.4 percent for commitments and 1 percent for disbursements. The 75th percentile is about 5 percent for commitments and 4 percent for disbursements.

Third, AfT commitments tend to be larger and more volatile than AfT disbursements. As seen in Table 1, mean commitments are strikingly larger than mean disbursements. The correlation coefficient between total commitments (*C_TOTAL*) and total disbursements (*D_TOTAL*) is "only" about 87% (p-value: 0.000). Figure 1 shows a scatter plot for *C_TOTAL*

[9] This is - next to our primary analysis (the analysis of AfT-effectiveness) - also the main contribution that this paper makes to the literature.

and *D_TOTAL*. The majority of observations (59%) lie well below the 45° line. The average shortfall of "total" disbursements below commitments amounts to US$ 67 million. This indicates that on average, donor countries do not fully match their commitments with actual disbursements.[10]

Figure 1: *Scatter plot of AfT commitments and AfT disbursements*



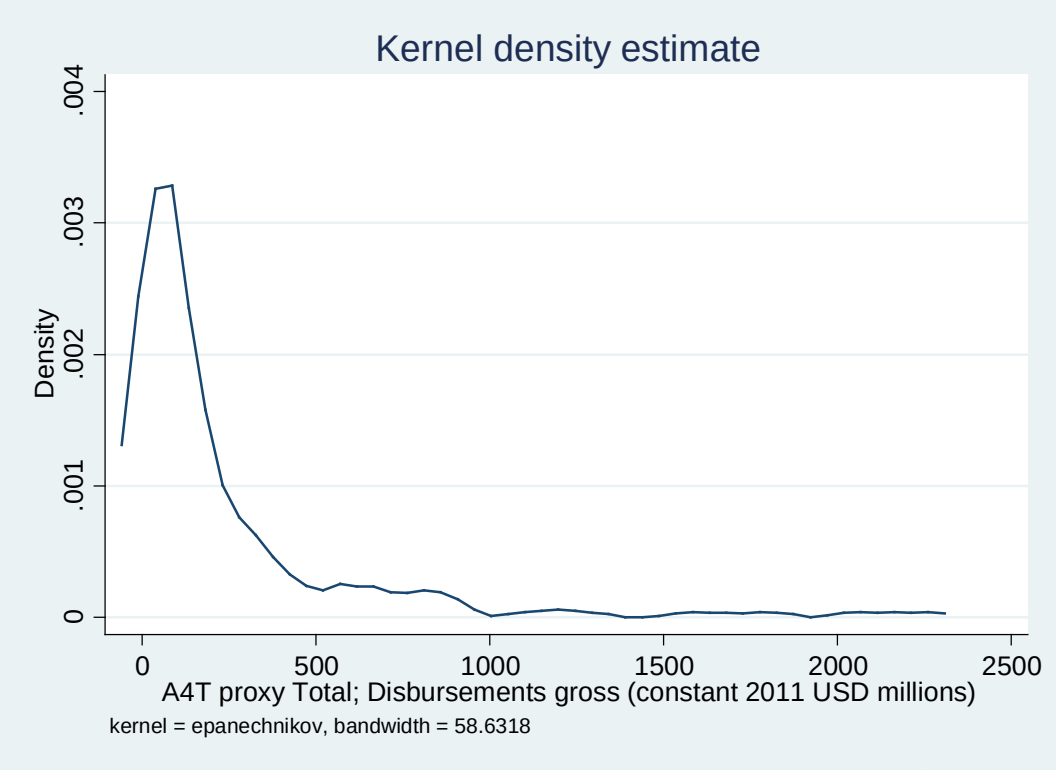
Source: *Own illustration based on own calculations.* ***Data:*** *OECD (2013a).* ***Notes:*** *Due to illustration purposes, the range is limited to [0, 2100].*

Fourth, the distribution of AfT commitments (or disbursements) seems to be skewed to the right (positive skewness). While this cannot be seen in Table 1, it can be inferred from the scatter plot in Figure 1. The Figure shows many observations with relatively small AfT commitments, and few observations with high commitments. In other words, the mass of the distribution lies to the left. The skewness can also be seen in Figure 2, which depicts a Kernel density function, an estimate of the density function for *D_TOTAL* for the year 2009. In Figure

[10] This gap between commitments and disbursements is also pointed out by Adhikari (2011: 9).

2, it is obvious that the estimated distribution is skewed to the right. The bulk of the countries receive relatively little AfT, while some countries receive significantly more.[11] Another way to illustrate this fact is to compute percentiles for the distribution of *C_TOTAL* and *D_TOTAL*, as done in Table A.4. While the median value of *D_TOTAL* is smaller than US$ 65 million, the 90th percentile is almost ten times as large.

Figure 2: *Kernel density estimate for AfT disbursements (D_TOTAL) for the year 2009.*



Source: *Own illustration based on own calculations.* ***Data:*** *OECD (2013a).* ***Notes:*** *Kernel = Epanechnikov; bandwidth = 53.3482.*

The second part of Table 1 reports summary statistics on the dependent and control variables. It is worth noting here that the *CPI* (base year: 2005) ranges between 0.288 and 293318. The outliers belong to Zimbabwe, which recently experienced a period of hyperinflation (see, e.g., Hanke, 2008). The outliers inflate the standard deviation and the mean, and are hence eliminated from the final regression. When excluding the observations for

[11] That "[AfT] (...) is relatively concentrated" is also discussed in OECD/WTO (2011: 14).

Zimbabwe, the mean (standard deviation) of the *CPI* drops from above 300 (7,800) to around 100 (25).

After having presented the empirical model in Section 2; and data and descriptive statistics in this section, we discuss the results of the regression analysis in the following section.

4. Main Results

In this section, we fit the model specified in Section 2 by using data for 162 countries over the period 2002 to 2011 (for AfT disbursements) and using several estimation techniques: (i) a (*pooled) OLS regression with time fixed effects and regional dummy variables* (as a benchmark), (ii) a *fixed* (or *random) effects regression and (iii) a panel-quantile approach*. The choice between using fixed or random effects ultimately depends on our assumption about the correlation between the unobserved effect and the explanatory variables (see, e.g., Wooldridge, 2001: 288). We run a Hausman test in order to determine whether it is more appropriate to use fixed effects or random effects. The test results indicates a rejection of the null hypothesis (the unobserved effects are uncorrelated with the explanatory variables), indicating that fixed effects should be used.[12]

Table 2 reports the baseline results of the regression analysis. When running the OLS regressions (OLS1 and OLS2), we include time and regional fixed effects. In the fixed effects regressions (FE1 and FE2), time dummies are also included. We also perform some regression diagnostics. For the *OLS-regressions*, the residuals are close to normal and homoscedastic. There is also no multicollinearity problem. In the *fixed effects models*, heteroscedasticity and autocorrelation were present. Consequently, we use standard error estimates that are robust to these disturbances (Hoechle, 2007: 285). We now discuss our results in some detail.

[12] We assume that the requirements and assumptions of the Hausman test are fulfilled. A discussion of these issues goes well beyond the scope of this paper.

Table 2: *Baseline regression results. Dependent variable: ln (exports of goods and services in constant 2005 US$ millions). Key explanatory variables: log AfT disbursements*

	OLS1	OLS2	FE1	FE2
	b/se	b/se	b/se	b/se
L2_ln_D_TOTAL	0.42***		0.02*	
	(0.09)		(0.01)	
L2_ln_D_TPR		0.19***		-0.010**
		(0.03)		(0.005)
L2_ln_D_EI		0.11		0.010
		(0.07)		(0.01)
L2_ln_D_BPC		0.18		0.050**
		(0.11)		(0.02)
L2_ln_D_GBS	-0.18***	-0.19***	-0.002	-0.003
	(0.02)	(0.03)	(0.00)	(0.00)
Population	0.004***	0.003***	0.004***	0.003***
	(0.00)	(0.00)	(0.00)	(0.00)
ln_MP1	-0.22*	-0.23	0.85**	0.93**
	(0.13)	(0.19)	(0.35)	(0.39)
GE	0.65***	0.69***	0.05	0.09
	(0.09)	(0.13)	(0.05)	(0.08)
ln_CPI	-0.11**	-0.07	-0.03***	-0.04***
	(0.05)	(0.05	(0.01)	(0.01)
Africa Dummy	-0.73***	-0.31		
	(0.21)	(0.24)		
America Dummy	0.12	0.41*		
	(0.20)	(0.25)		
Asia Dummy	-0.12	0.11		
	(0.20)	(0.25)		
Pacific Dummy	-2.02***	-1.73		
	(0.32	(0.41)		
Constant	9.78***	10.44***	0.29	-0.22
	(1.53)	(2.09)	(3.16)	(3.58)
Obs	417	356	417	356
R-sqr(within)	0.45	0.51	0.99	0.99

Notes: ** p<0.10, ** p<0.05, *** p<0.01. Year and region dummies are included in the OLS regressions, in columns (1) and (2). Coefficients for these dummies are not reported. Standard error estimates in columns (3) to (4) are robust to heteroscedasticity and autocorrelation (see Hoechle, 2007: 285). Time dummies are also included in columns (3) and (4).*

In columns (1) and (2), we run *OLS-regressions*. In (1), we regress the log of exports of goods and services on the log of "total" AfT disbursements lagged by two years while controlling for *Population* size, the log of *MP1*, government effectiveness and the log of the

CPI. Year and region dummies are included. In (2), we make use of our four "defined" aid categories (three AfT categories and GBS) and regress the log of exports on the logs of aid disbursed to TPR, to EI, to BPC and to GBS (all lagged by two years) and on our baseline controls. In column (1), the coefficient of *L2_ln_D_TOTAL*—the log of "total" AfT-disbursements lagged by two years—is positive and statistically significant. Hence, the results of the *(pooled) OLS regression* suggest that larger "total" AfT disbursements are, ceteris paribus and on average, associated with higher exports of goods and services in the future. The coefficients of our lagged and logged AfT proxies in (2) are statistically significant and positive for aid disbursed to TPR; and negative for GBS (used for contrasting the results obtained for AfT). The coefficient of aid disbursed for GBS is plausible when recipient countries do not stress trade development. Overall, the coefficients of our baseline controls in (1) and (2) have the expected signs except for the log of market potential (which has a negative but statistically insignificant coefficient). The coefficients of *Population* and *GE* are statistically significant at the one percent level. To conclude, most coefficients—except for the coefficient of (the log of) *MP1*—have the expected signs. "Total" AfT-disbursements and aid disbursed to TPR seem to be effective. The effect of aid disbursed to EI cannot be distinguished from zero and aid disbursed to GBS may even be counter-productive. However, these findings should be taken with caution since we did not fully control for unobserved (time-invariant) heterogeneity in these regressions given that we use regional fixed effects but not country fixed effects.

Columns (3) and (4) in Table 2 present the results obtained by estimating (country) *fixed effects regressions*. The logs of aid disbursed to BPC, *Population, Market Potential* and of the *CPI* are statistically significant in all specifications in which they are included. In (3), the coefficient of total AfT disbursements is positive and statistically significant at the 10 percent level. A larger population and smaller *CPI* are, ceteris paribus and on average, associated with higher exports. The coefficients of *GE* and market potential are positive but insignificant. The main finding of (3) is that "total" AfT disbursements seem to be effective. In (4), only the

coefficient of aid disbursed to BPC is positive and statistically significant at the 5 percent level. AfT to building productive capacity seems to drive the positive impact of total AfT. The coefficient of AfT for TPR is even negative and significant and the coefficient of AfT for EI is insignificant.

To conclude, the main finding of (4) is that aid disbursed to BPC is associated with higher future exports. Other AfT disbursements seem to be ineffective. We also experimented with alternative controls. We substituted the log of *MP1* by the logs of *MP2* and *MP3*, respectively. The coefficient of market potential was positive and not statistically significant when using fixed effects irrespective of the size of the distance weighting parameter (see Section 2). The size of all other coefficients does not change much and the coefficient of *GE* stays statistically insignificant. Finally, we use *SOLR* instead of *GE* to control for institutional quality. This leaves all other coefficients almost unaffected. The coefficient of *SOLR* has a positive sign, as expected, but is statistically insignificant. Note that the coefficient of (the log of lagged) aid disbursed to BPC is positive and statistically significant, whereas the coefficients of all other AfT proxies cannot be distinguished from zero. Based on these results, it can be said that aid disbursed to PBC is effective. If aid disbursed to BPC increases by 100 percent, we would expect exports of goods and services to be about 5 percent higher two years later.

In short, the FE regression results indicate that "total" AfT disbursements are effective on average. It is notable that coefficients do not change if we run the regressions shown with AfT disbursements lagged by one year instead of two years[13]. When controlling for country heterogeneity and using our three original AfT proxies, we find that aid disbursed to BPC is associated with higher future exports. Other AfT disbursements seem to be ineffective. These results are in line with those of Vijil and Wagner (2012) and not in line with Calì and Te Velde (2011) who find AfT for economic infrastructure to be effective and to drive the effectiveness of

[13] We also run all regressions presented thus far with commitments instead of disbursements. Results, which are available upon request, are far from being satisfactory. When running the regressions with commitments (lagged by one and two years), the coefficients of the vast majority of AfT proxies are statistically insignificant. It seems that data on AfT commitments has very little explanatory power for export performance.

total AfT. Hühne et al. (2014) find total AfT and all AfT components to be effective, in particular AfT for trade policy and regulation.

Given the mixed results obtained so far, we find a more differentiated approach warranted as it could also be that the effectiveness of AfT depends on the level of exports and on the time frame studied. In what follows we will present the short-run and long run impact of AfT in exports using a panel-quantile framework. For the panel quantile regressions, we have to transform our variables and do a few adjustments by hand as no ready-made estimation routines are available. First, we control for country heterogeneity by subtracting country fixed effects from the log of exports. Second, we control for autocorrelation by estimating the autocorrelation coefficient and transforming all variables by means of the Feasible Generalized Least Squares (FGLS) method. Third, we look at the short-run and long-run impact of AfT by estimating a short-run and a medium to long-run model. In the short-run version we lag AfT by 2 years following the literature; in the medium-to long-run version we "exogenize" AfT by means of a simplified dynamic OLS (DOLS) approach[14].

In Table 3 we find that total AfT is effective in the short run in the 0.10 and 0.25 quantile. Non-targeted aid (aid for global budget support), in contrast, is insignificant or even has a negative impact in the 0.75 quantile. Population, market potential and government effectiveness carry the expected positive sign. Inflation has an ambiguous impact on exports as minor inflation might send out a positive signal and enhance production (positive sign), but higher rates of inflation might confuse producers and reduce the competitiveness of exporters (negative sign).

Table 3: Short-run panel-quantile regression results

	(1)	(2)	(3)	(4)
	M1(Q.1)	M2(Q.25)	M3(Q.5)	M4(Q.75)

[14] DOLS consists on estimating the model adding lead and lags of the first differenced explanatory variables. The number of lead and lags is selected to be equal 1 due to the short-time span of the simple.

L2_ln_D_TOTAL	0.23**	0.22*	0.11	-0.04
	(0.12)	(0.13)	(0.15)	(0.06)
L2_ln_D_GBS	0.01	-0.01	-0.03	-0.03*
	(0.03)	(0.02)	(0.02)	(0.02)
Population	0.005***	0.005***	0.01	0.01***
	(0.00)	(0.00)	(0.01)	(0.00)
ln MP1	1.75***	0.87	0.22	0.23
	(0.39)	(0.34)	(0.30)	(0.44)
GE	0.04	0.17	0.16	0.36
	(0.20)	(0.21)	(0.28)	(0.26)
ln CPI	0.15***	0.07	-0.03	-0.09***
	(0.04)	(0.05)	(0.05)	(0.03)
Nobs	296	296	296	296
Pseudo R2	0.13	0.13	0.13	0.13

Notes: *Dependent variable: ln(Exports of goods and services in constant 2005 US$ millions). The FE used to transform exports are from the fixed effect regression. Key explanatory variables: 2nd lag of logged AfT disbursements. Active control of auto correlation via the FGLS technique and Huber Sandwich standard errors* in parentheses. *Time fixed effects were included but are not reported being insignificant.*
** p<0.10, ** p<0.05, *** p<0.01.*

In the medium to long term, the effects of AfT become more noticeable (Table 4). Total AfT is now effective in the 0.10, 0.25 and 0.50 quantile. Aid for global budget support, in contrast, leads to distortions in production and exports which even play out negatively in the 0.50 and the 0.75 quantiles. Population, market potential and government effectiveness contribute positively to export growth and so does the rate of inflation.

Table 4: Long-run panel-quantile regression results

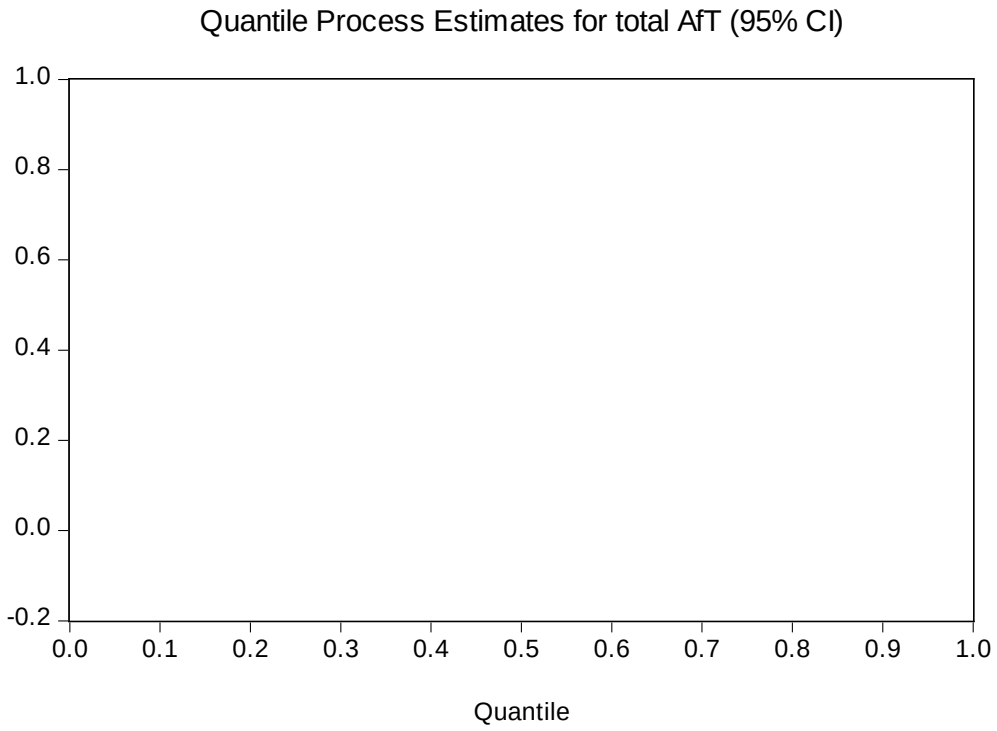
	(1) M1(Q.1)	(2) M2(Q.25)	(3) M3(Q.5)	(4) M4(Q.75)
ln_D_TOTAL	0.42*	0.36**	0.30**	-0.003
	(0.26)	(0.18)	(0.14)	(0.08)
ln_D_GBS	-0.008	-0.05	-0.07***	-0.09***
	(0.05)	(0.03)	(0.03)	(0.03)
Population	0.002	0.03***	0.02***	0.02***
	(0.01)	(0.00)	(0.01)	(0.00)
ln MP1	0.32	0.31	0.46***	0.66***
	(0.71)	(0.19)	(0.17)	(0.24)
GE	0.14	0.47**	0.32	0.21
	(0.21)	(0.24)	(0.25)	(0.24)
ln CPI	0.11	0.60*	0.57*	0.46
	(1.27)	(0.31)	(0.33)	(0.50)
Endogeneity control (DOLS)[15]	Vars in 1st diff added	Vars in 1st diff added	Vars in 1st diff added	Vars in 1st diff added

[15] Due to data limitations only the first differences of the right-hand side variables were included. When the lags of the first differences were included as well they were not significant. Including also both the lags and leads of the 1st-differences the t-statistics of all variables become incalculable.

Nobs	292	292	292	292
Pseudo R2	0.15	0.15	0.15	0.15

Notes: *Dependent variable: ln(Exports of goods and services in constant 2005 US$ millions). The FE used to transform exports are from the fixed effect regression. Key explanatory variables: 3 sub-categories of AfT disbursements. Active control of autocorrelation via the DFGLS technique and Huber Sandwich standard errors* in parentheses. *Time fixed effects were included but are not reported being insignificant.*
** p<0.10, ** p<0.05, *** p<0.01.*

Figure 4. Panel-quantile regression results for total AfT



Our main findings can be summarised as follows. The regression results indicate that "total" AfT disbursements are effective only for countries with a below median level of exports. The medium to long-run impact of AfT is stronger than the impact within a 2-year period. A doubling of AfT increases exports in between 30 to 40 percent at the lower ends of the export distribution over a time span of 10 years (2002-2011 period). Even though this effect is moderate, giving higher amounts of AfT to weak exporters would indeed promote exports where it is most needed.

Assuming that countries and time periods with low exports are characterized by certain supply side constraints we will now turn to the analysis of those supply side constraints and investigate how certain sub-categories of AfT can help overcome those impediments. Hence, aid for trade policy and regulation can improve insufficient knowledge on how to develop an adequate trade policy concept or to participate in trade negotiations; aid for economic infrastructure can supplement insufficient means in recipient countries to invest in economic infrastructure and aid for building productive capacity can counteract insufficient means and knowledge related to under-developed productive capacity in agriculture, industry and mining.

For the short run (Table 5) we find that aid disbursed to trade policy and regulation (TPR) is not effective within a 2-year timeframe. Aid disbursed to EI is associated with higher exports only in the lowest quantile. All other things equal, if aid disbursed to EI increases by 100 percent, we would expect exports of goods and services to be on average about 26 percent higher two years later. Also, aid given to enhance production capacity (BPC) appears to be mostly effective, while aid disbursed to GBS, a non-AfT aid component, does not promote export performance.

Table 5. Short-run panel-quantile regression results for specific types of aid

	(1) M1(Q.1)	(2) M2(Q.25)	(3) M3(Q.5)	(4) M4(Q.75)
L2_ln_D_TPR	0.01	0.02	0.01	0.002
	(0.03)	(0.03)	(0.04)	(0.05)
L2_ln_D_EI	0.26**	0.11	0.15	0.12
	(0.14)	(0.17)	(0.16)	(0.10)
L2_ln_D _BPC	0.20**	0.29***	0.11	0.16***
	(0.09)	(0.11)	(0.07)	(0.06)
L2_ln_D_GBS	-0.003	-0.02	-0.05	-0.05***
	(0.02)	(0.03)	(0.03)	(0.02)
Population	0.004***	0.004***	0.01	0.01**
	(0.00)	(0.00)	(0.01)	(0.00)
ln MP1	1.52***	0.73*	0.36	0.16
	(0.41)	(0.42)	(0.30)	(0.37)
GE	0.02	0.13	0.03	0.48
	(0.23)	(0.24)	(0.41)	(0.25)
ln CPI	0.19***	0.10	-0.006	-0.003
	(0.05)	(0.08)	(0.07)	(0.05)
Nobs	243	243	243	243

Pseudo R2	0.17	0.17	0.17	0.17

Notes: *Dependent variable: ln(Exports of goods and services in constant 2005 US$ millions). The FE used to transform exports are from Table 2, column 4. Key explanatory variables: 2nd lag of 3 AfT-sub-categories. Active control of auto correlation via the FGLS technique and Huber Sandwich standard errors* in parentheses*. Time fixed effects were included but are not reported being insignificant. * p<0.10, ** p<0.05, *** p<0.01.*

As to the medium to long run (Table 6), we find aid for trade policy and regulation to be effective in all quantiles, with the effect increasing for higher quantiles. Again, aid for economic infrastructure is only effective in the lowest (10 percent) quantile and aid for building productive capacity is effective in all below median quantiles of the export distribution. Aid for global budget support, a non-AfT aid component, is detrimental to exports, most probably due to disincentives to production and export.

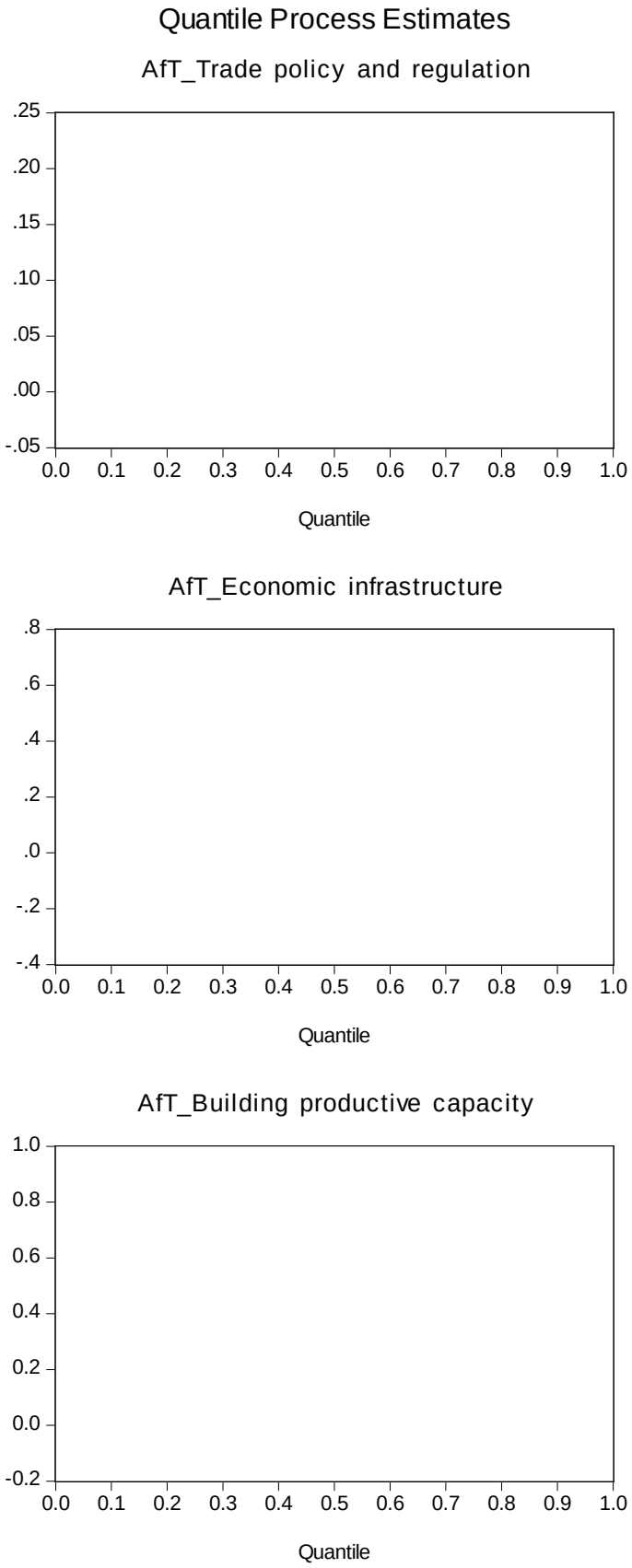
Table 6. Long-run panel-quantile regression results for specific types of aid

	(1) M1(Q.1)	(2) M2(Q.25)	(3) M3(Q.5)	(4) M4(Q.75)
ln_D_TPR	0.07*	0.13***	0.13***	0.17***
	(0.04)	(0.05)	(0.03)	(0.04)
ln_D_EI	0.33***	0.27	0.17	0.06
	(0.13)	(0.14)	(0.11)	(0.12)
ln_D _BPC	0.59***	0.40***	0.28***	0.15
	(0.18)	(0.17)	(0.09)	(0.15)
ln_D_GBS	-0.09*	-0.10***	-0.11***	-0.15***
	(0.05)	(0.04)	(0.03)	(0.04)
Population	0.03***	0.03***	0.02***	0.02***
	(0.01)	(0.01)	(0.00)	(0.01)
ln MP1	0.89***	0.37	0.40*	0.25
	(0.28)	(0.28)	(0.19)	(0.21)
GE	0.18	0.28	0.41	0.32
	(0.19)	(0.27)	(0.25)	(0.24)
ln CPI	-0.96	0.32	0.64	1.29***
	(0.66)	(0.46)	(0.38)	(0.46)
Endogeneity control (DOLS)[16]	Vars in 1st diff added	Vars in 1st diff added	Vars in 1st diff added	Vars in 1st diff added
Nobs	240	240	240	240
Pseudo R2	0.25	0.25	0.25	0.25

Notes: *Dependent variable: ln(Exports of goods and services in constant 2005 US$ millions). The FE used to transform exports are from Table 2, column 4. Key explanatory variables: 3 types of logged AfT disbursements. Active control of autocorrelation via the DFGLS technique and Huber Sandwich standard errors* in parentheses*. Time fixed effects were included but are not reported being insignificant. * p<0.10, ** p<0.05, *** p<0.01.*

[16] Due to data limitations only the first differences of the right-hand side variables were included. When the lags of the first differences were included as well they were not significant. Including also both the lags and leads of the 1st-differences the t-statistics of all variables become incalculable.

Figure 5. Panel-quantile regression results for AfT sub-categories



5. Econometric issues

First, as to the treatment of endogeneity, in the short-run model we do not substantially treat the reverse causality problem. Following Hühne et al. (2014) we try to control for the possible endogeneity of AfT by lagging the series by two periods. In economic terms, we hence assume that AfT today affects exports after 2 years. The delay of two years can be justified by a reaction lag concerning the production and export of goods and services. Thus, we mitigate the endogeneity problem by working with lagged values of AfT. Calì and Te Velde (2011) also have come across the endogeneity problem and have employed instrumental variable estimators to overcome this issue. In their case, controlling for endogeneity has changed the size of the coefficients, but the main conclusion about AfT effectiveness have not changed. However, in the medium to long-run model we actively control for endogeneity of all variables by means of the DOLS approach which accounts for the endogeneity of all right-hand side variables by including these variables in first differences. Due to the limited number of observations, we do without the leads and lags of the variables in first differences and thus run a simplified version of DOLS. In Tables 4 and 6 we present our results applying these -time series based- panel estimation techniques and control for endogeneity via DOLS respectively Dynamic Feasible Generalized Least Squares (DFGLS) when also tackling autocorrelation. These techniques look at the time series properties of the series and check whether the aid/AfT-export relationship holds in the period under study elaborating more the medium to long-run results concerning the impact of AfT. After testing for unit roots and cointegration and finding that the series are I(1) and form a cointegration relationship for the period of 2001-2011 (see appendix Table A5 and A6), we find that by controlling for reverse causality both total AfT and its sub-categories have a significant impact on exports at the lower ends of the distribution.

Second, in the estimated short-run model model, we do not allow for any "dynamics" in the form of persistence of exports. Calì and Te Velde (2011: 731) stress "exports are fairly persistent over time, as they tend to depend on previous exports." To deal with this issue, they test some dynamic specifications and employ GMM techniques. We checked the requirements for the GMM approach in our dataset and found that the 'no second order autocorrelation' assumption was violated. This renders GMM an inadequate technique.

6. Conclusion

It is widely recognized that one of the main objectives of AfT is to promote exports of goods and services. Given this aim, this paper investigates the extent to which AfT is effective in promoting trade, in particular in countries with a weak export capacity. To this end, we analysed whether AfT and its different components are associated with higher exports of goods and services, quantify the effects and investigate whether these effects depend on the conditional distribution of exports and the time frame studied.

We find that total AfT disbursements are only effective at the lower tails of the distribution of exports (0.1, 0.25, and 0.50 quantiles), where they promote exports of goods and services. All things equal, an increase of "total" AfT disbursements by 100% is associated withan increase in exports between 30 to 40 % depending on the quantile and stretched over a 10 year time period. Not surprisingly, the positive effects of AfT are more pronounced in the longer run than in the short run.

We also find that only specific types of AfT are effective. We find evidence of AfT to support trade policy and regulation is effective in all quantiles of the export distribution only in the longer run. For this time span, aid disbursed to building production capacity (BPC) is effective at the lower quantiles of the export distribution. This could mean that smaller exporters with a more reduced basis in knowledge and experience profit more from AfT for BPC. This type of aid is sector-specific and can take the form of technical assistance (training provided by

experts) and/or transfers in the form of grants and loans. The quantile regression results indicate that if aid disbursed to BPC increases by 100%, we would expect exports of goods and services to increase in a range of 30% to 60% over a period of ten years.. Effectiveness of aid for EI is only found for the lowest (10%) quantile. A doubling of infrastructure-related aid in these quantiles leads to an increase of exports by 33 %. Therefore an increase of AfT for economic infrastructure would especially help less mature exporters and supposedly the poorer countries. For comparison, aid disbursed under GBS is in general not associated with higher exports. It rather is counter-productive as it seems not to be used to improve the business environment.

In conclusion, as to the longer-run impact of AfT we find that on the one hand Calìaid disbursed to TPR is the only category of AfT that seems to be effective independently of the export amount. This result is in line with the findings of Hühne et al. (2014) who find firstly AfT to TPR to have the strongest impact and secondly, all AfT sub-categories to be effective. On the other hand, our results indicate that certain types of AfT, such as AfT for economic infrastructure, which is considered as generally effective by Calì and Te Velde (2011)is only effective in the lowest tail the export distribution. Also, AfT for building productive capacity is only effective at the lower tails of the export distribution

Further research should investigate the topic of AfT effectiveness in greater detail. To date, we know that some types of AfT are effective in promoting exports, whereas others are not so effective. An important question for further research will be to investigate the reasons for why some types of AfT are less effective. Additionally, the relationship between AfT and a number of social outcomes (such as poverty rates) should also be investigated as increased trade is only a means to an end and not an end in itself.

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Table A.1. *List of countries*

Afghanistan	Equatorial Guinea	Pakistan
Angola	Grenada	Panama
Albania	Guatemala	Peru
Argentina	Guyana	Philippine
Armenia	Honduras	Palau
Antigua and Barbuda	Croatia	Papua New Guinea
Azerbaijan	Haiti	Paraguay
Burundi	Indonesia	Rwanda
Benin	India	Saudi Arabia
Burkina Faso	Iran, Islamic Rep.	Sudan
Bangladesh	Iraq (no exports)	Senegal
Bahrain	Jamaica	Solomon Islands
Bosnia and Herzegovina	Jordan	Sierra Leone
Belarus	Kazakhstan	El Salvador
Belize	Kenya	Sao Tome and Principe
Bolivia	Kyrgyz Republic	Suriname
Brazil	Cambodia	Slovenia
Barbados	St. Kitts and Nevis	Swaziland
Bhutan	Lao PDR	Seychelles
Botswana	Lebanon	Syrian Arab Republic
Central African Republic	Liberia	Chad
Chile	Libya	Togo
China	St. Lucia	Thailand
Cote d'Ivoire	Sri Lanka	Tajikistan
Cameroon	Lesotho	Turkmenistan
Congo, Rep.	Morocco	Tonga
Colombia	Moldova	Trinidad and Tobago
Comoros	Madagascar	Tunisia
Cape Verde	Maldives	Turkey
Costa Rica	Mexico	Tanzania
Cuba	Macedonia, FYR	Uganda
Djibouti	Mali	Ukraine
Dominica	Malta	Uruguay
Dominican Republic	Mongolia	Uzbekistan
Algeria	Mozambique	St. Vincent and the Grenadines
Ecuador	Mauritania	Venezuela, RB
Egypt, Arab Rep.	Mauritius	Vietnam
Eritrea	Malawi	Vanuatu
Ethiopia	Malaysia	Samoa
Fiji	Namibia	Yemen, Rep.
Gabon	Niger	South Africa
Georgia	Nigeria	Congo, Dem. Rep.
Ghana	Nicaragua	Zambia
Guinea	Nepal	Zimbabwe
Gambia, The	Oman	

Table A.2: *List of variables, abbreviations, description and sources*

	Variable	Variable description	Source
Key explanatory variables (AfT-proxies)	C_TPR	A4T proxy for Trade Policy and Regulations; Commitments*	own calculations; CRS
	C_EI	A4T proxy for Economic Infrastructure; Commitments*	own calculations; CRS
	C_BPC	A4T proxy for Building Productive Capacity; Commitments*	own calculations; CRS
	C_GBS	AID proxy for General Budget Support; Commitments*	own calculations; CRS
	C_TOTAL	A4T proxy Total; Commitments*	own calculations; CRS
	D_TPR	A4T proxy for Trade Policy and Regulations; Disb. gross*	own calculations; CRS
	D_EI	A4T proxy for Economic Infrastructure; Disb. gross*	own calculations; CRS
	D_BPC	A4T proxy for Building Production Capacity; Disb. gross*	own calculations; CRS
	D_GBS	AID proxy for General Budget Support; Disb. gross*	own calculations; CRS
	D_TOTAL	A4T proxy Total; Disbursements gross*	own calculations; CRS
Dependent variable and important controls	Exports	Exports of goods and services (constant 2005 US$ millions)	WDI
	Population	Population, total (in millions)	WDI
	MP1	Market Potential 1 (with simple distances)	own calc.; WDI, CEPII
	GE	Government Effectiveness (-2.5=weak to 2.5=strong gov. performance)	WGI
	CPI	Consumer price index (2005 = 100)	WDI
Other controls	MP2	Market Potential 2 (with square root distances)	own calc.; WDI, CEPII
	MP3	Market Potential 3 (with squared distances)	own calc.; WDI, CEPII
	SOLR	Strength of legal rights index (0=weak to 10=strong)	WDI

Notes: ** constant 2011 US$ millions. CEPII: Centre d'Etudes Prospectives et d'Informations Internationales, CEPII (2011a/b); CRS: Creditor Reporting System, OECD (2013a); Disb.: Disbursements; Gov.: government or governance; own calc.: own calculations; WDI: World Development Indicators, World Bank (2011a); WGI: World Governance Indicators, World Bank (2011b).*

Table A.3: *Composition of AfT proxies (AfT categories). AfT proxies are calculated as the sum of ODA for the corresponding sectors.*

Sector-number	Sector	AfT-proxy / Aid-proxy	Abbr.	
331	Trade Policy and Regulations	Trade Policy and Regulations (TPR)	A4T_TPR	A4T_TOTAL
210	Transport and Storage	Economic Infrastructure (EI)	A4T_EI	
220	Communications			
230	Energy Generation and Supply			
240	Banking and Financial Services			
250	Business and Other Services			
311	Agriculture	Building Productive Capacity (BPC)	A4T_BPC	
312	Forestry			
313	Fishing			
321	Industry			
322	Mineral Resources and Mining			
332	Tourism			
510	General Budget Support	General Budget Support (GBS)	AID-GBS	

Notes: *Illustrations are based partly on OECD (2013c). AfT proxies are calculated as the sum of ODA for the corresponding sectors as shown in the table. For example, EI is calculated as the sum of ODA for the three sectors, "Transport and Storage", "Communications" and "Energy Generation and Supply". If data on ODA for some sectors was missing, the AfT proxy was calculated as the sum of ODA for the other sectors, i.e. when calculating the sum over all corresponding sectors, missing values are set equal to 0 as long as not all values are missing (in which case the AfT proxy would be missing too). Abbr.: Abbreviations.*

Table A.4: *Percentiles for C_TOTAL* and *D_TOTAL (in constant 2011 US$ millions)*

Percentiles	1%	5%	10%	25%	50%	75%	90%	95%	99%
Aid Disb	0.130	1.458	3.681	15.775	73.078	259.225	679.976	1075.387	2160.135
Aid Com	0.257	1.887	3.949	15.848	63.060	199.951	510.998	809.857	1598.119

Source: *Own calculations with data from* Creditor Reporting System, OECD (2013a).

Table A. 5: *ADF Fisher unit root tests*

	ADF-Fisher Chi-square statistic	p-value
Ln exports	201.94	0.68
LnAfT	185.73	1.00
LnAfT_TPR	177.15	0.23
LnAfT_EI	211.83	0.99
LnAfT_BPC	272.19	0.45
LnAid_GBS	41.89	0.96
Pop	186.87	1.00
LnMp1	89.15	1.00
GE	272.67	0.81
LnCpi	176.80	1.00

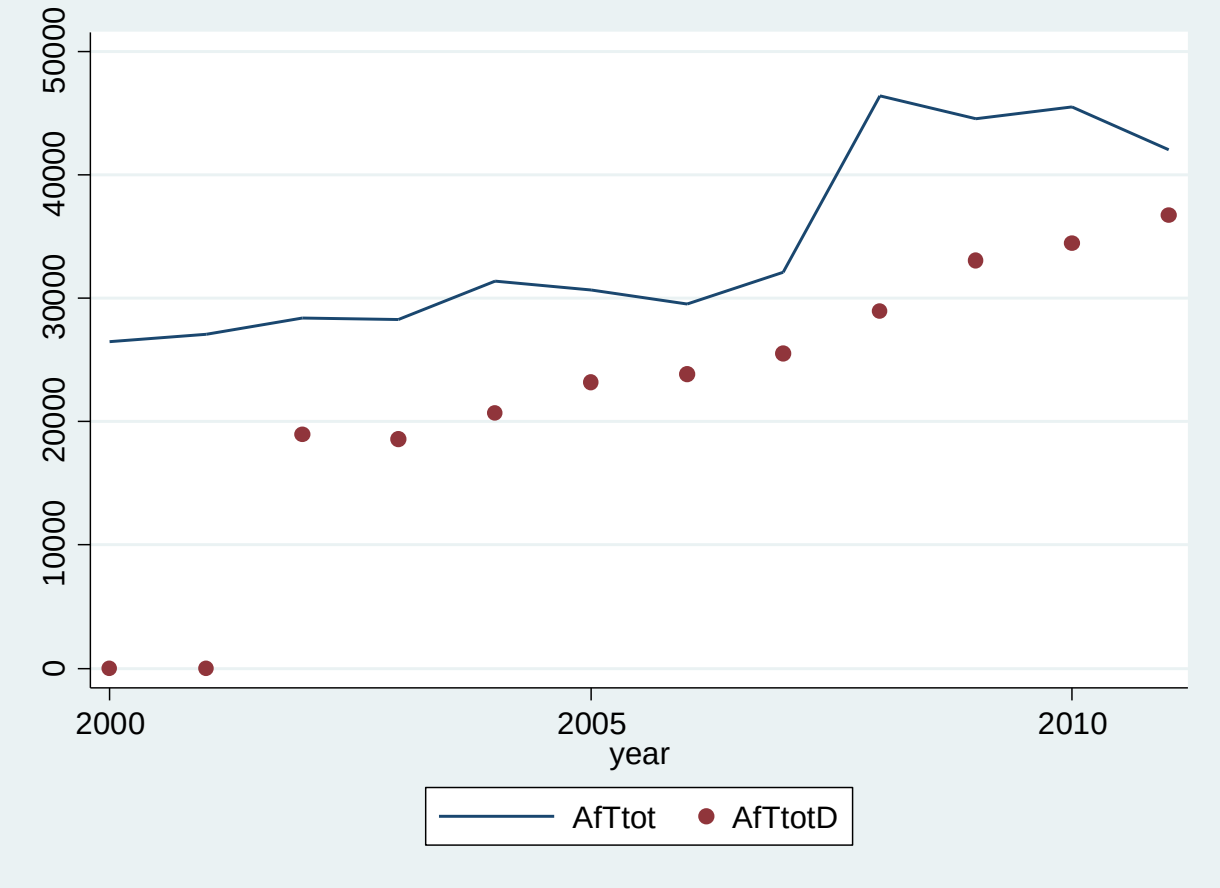
Note: Null hypothesis: Unit root, ie. the series is non-stationary. Probabilities for Fisher ADF tests are computed using an asymptotic Chi-square distribution.

Table A. 6: *Kao residual co integration test*

	ADF t-statistic	p-value
Cointegration between lnExports, LnAfT, LnAid_GBS, Pop, LnMp1, GE, LnCpi	1.32*	0.09
Cointegration between lnExports, LnAfT_TPR, LnAfT_EI, LnAfT_BPC, LnAid_GBS, Pop, LnMp1, GE, LnCpi	2.93***	0.01

Note: Null hypothesis: No cointegration

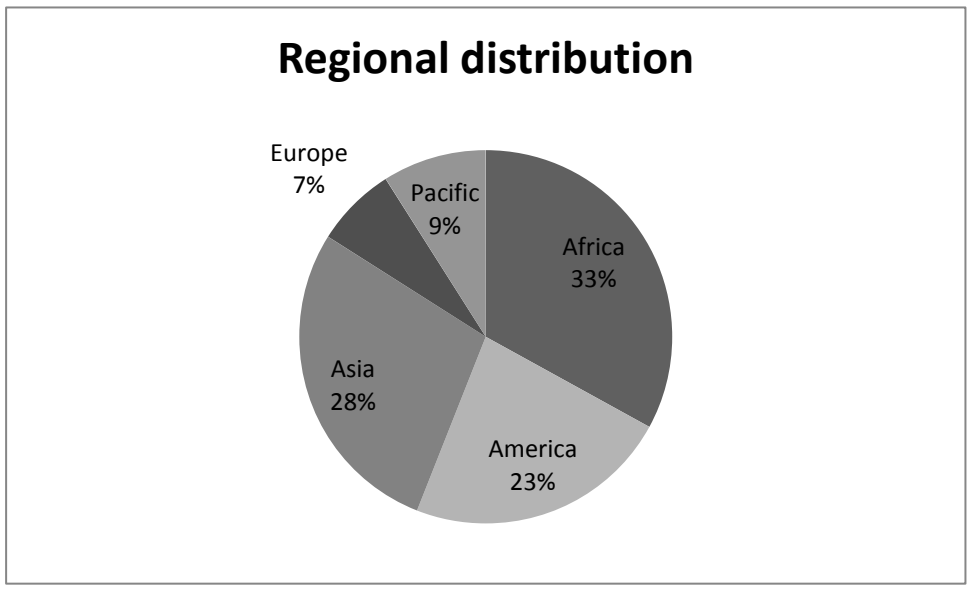
Figure A.1. Evolution over time of AfT commitment and Disbursements



Note: AfTtot denotes total AfT commitments and AfTtotD refers to disbursements figures.

Source: Creditor Reporting System, OECD (2013a).

Figure A.2: *Regional distribution of countries included in our analysis*



Notes: *Figures based on own calculations. Data are from CEPII (2011a). Shares add up to 1.*