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Abstract:

Recent studies offer an ambiguous picture on the effectiveness of foreign aid in strengthening the export capacity of recipient countries. Moreover, the literature on aid for trade (AfT) has often neglected that exporters in the donor countries may be among the main beneficiaries. We hypothesize that AfT is as much in the self-interest of donor countries as it may have promoted the exports of recipient countries. We simultaneously estimate and compare the effects of AfT on trade in both directions. We find that AfT increases recipient exports to donors as well as recipient imports from donors. The first effect tends to dominate the latter, which contradicts the skeptical view that donors grant AfT primarily to promote their own export interests.

Keywords: aid effectiveness, aid for trade, recipient exports, donor exports.

JEL classification: F35, F14

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1. Introduction

It is increasingly recognized that trade liberalization is not sufficient to improve the development prospects of many low-income countries. According to Suwa-Eisenmann and Verdier (2007: 482), these countries need “not only technical assistance to trade, but, more generally, aid designed to reduce transactions costs of various kinds, many of them ‘behind the border’ and to alleviate the social cost of trade liberalization.” Against this backdrop, the Aid-for-Trade (AfT) Initiative was launched at the WTO Ministerial Conference in Hong Kong in 2005 in order to more closely align aid and trade policies. It was agreed “to expand aid to support developing countries in increasing exports of goods and services, and benefitting from free trade and increased market access” (OECD and WTO 2011: 1). Even though the donors did not offer a new global fund, aid for trade shall help “overcome the supply-side and trade-related infrastructure constraints” (ibid) of developing countries.

As stressed by OECD Secretary General, Angel Gurría, the OECD-WTO’s own evaluation report of 2011 presents various success stories and “paints a welcome picture of aid for trade contributing to better lives of women and men across the developing world.”¹ However, there are few systematic and independent assessments of the AfT initiative. Moreover, recent empirical studies offer a highly ambiguous picture on the effectiveness of foreign aid in promoting the recipient countries’ exports. Cali and Te Velde (2011) as well as Helble et al. (2012) find that AfT is positively associated with recipient exports. According to Pettersson and Johansson (2013), the effect of AfT on recipient exports is small, compared to the effects of other types of aid. Brenton and von Uexkull (2009) show that product-specific technical assistance projects coincided with increased exports of supported product lines; but the selection of projects may have been biased towards promising product lines, rather than being truly exogenous. Considering total bilateral aid, Nowak-Lehmann et al. (2013) conclude that the impact of aid on recipient exports is insignificant. The earlier study of

¹ See: <http://www.oecd.org/dac/aft/aidfortradeshowingresults.htm> (accessed: March 2013).

Munemo et al. (2007: 430) even finds that “a large amount of foreign aid adversely affects export performance of developing countries” by giving rise to Dutch disease.² Hence, the promotion of recipient exports by AfT cannot be taken for granted.

Furthermore, the literature on AfT has largely ignored so far that exporters in the donor countries may be among the main beneficiaries.³ This neglect is all the more surprising as donors are widely suspected to use aid as a means to foster their own commercial interest (e.g., Berthélemy 2006; Hoeffler and Outram 2011). Well before the OECD-WTO’s Aid-for-Trade Initiative, several studies had argued that aid tends to be tied to donor exports – either directly by requesting recipients to spend aid for supplies from the specific donor country, or indirectly by “habit-formation effects” or “goodwill effects” (Djajić et al. 2004).⁴ Recent empirical studies tend to corroborate this view.⁵

The principal contribution of this paper is to link the different strands of the literature on the effects of aid on trade. Specifically, we hypothesize that the AfT initiative was as much in the self-interest of donor countries as it may have promoted the exports of recipient countries. We offer an empirical assessment of this hypothesis by simultaneously estimating and comparing the effects of AfT on recipient and donor exports.

The paper proceeds as follows. We discuss the analytical background and the related empirical literature in Section 2. We explain the data and estimation approach in Section 3, and present our empirical results in Section 4. We find that AfT increases recipient exports to donors as well as recipient imports from donors. The first effect tends to dominate the latter,

² See also Munemo (2011) for a similar finding on the effects of total aid on export diversification in recipient countries.

³ Helble et al. (2012) and Pettersson and Johansson (2013) represent notable exceptions; see below for details.

⁴ See also Arvin et al. (2000). Martínez et al. (2009) argue that aid opens the door for exporters from the donor country.

⁵ Note, however, that none of the following studies focusses on AfT. Several studies underscore Wagner’s (2003) finding that it is not only Japan who uses aid to gain trade advantages. Nilsson (2004: 59) reports “large increases” in EU donors’ exports for each dollar of additional aid. Nowak-Lehmann et al. (2009) as well as Martínez-Zarzoso et al. (2009) find that German aid is associated with an increase in German exports that is larger than the aid flow. However, as stressed by McGillivray and Morrissey (1998), the specific nature of the relationship between aid and donor exports can vary across donor-recipient pairs. See also Lloyd et al. (2000), Arvin et al. (2000), and Osei et al. (2004). According to Silva and Nelson (2012), aid has positive effects on the exports from the donors to the recipients, while aid has negative effects on the exports from non-donor countries to the recipients.

which contradicts the skeptical view that donors grant AfT primarily to promote their own export interests. Section 5 concludes.

2. Analytical background and related literature

The existing literature on aid and trade provides limited theoretical guidance with respect to the relative strength of the effects of AfT on recipient versus donor exports. Suwa-Eisenmann and Verdier (2007: 485) survey the recent literature, summarizing that “aid flows may affect trade flows, either because of the general effects they induce in the recipient country, or because aid is directly tied to trade, or because it reinforces bilateral economic and political links (or a combination of all three).” Considerable ambiguity persists, however, on how the major transmission channels affect either donor exports or recipient exports – not to speak of the relative effects on trade in opposite directions.

Prima facie, several arguments suggest that the exporters in the donor countries could be the primary beneficiaries of AfT. This may be most obvious if aid is tied explicitly, obliging the recipient country to use aid for the import of goods and services from the donor country. As stressed by Tajoli (1999), however, formally tied aid does not necessarily increase donor exports. It cannot be ruled out that the recipient country might have to reduce overall imports if its terms of trade deteriorate due to tied aid.⁶ In this case, the effect on donor exports depends on the degree and direction of trade diversion. A particular donor granting tied aid may benefit from higher exports if trade diversion and the resulting increase in this donor’s market share are strong enough to offset the negative terms-of-trade effects on overall imports. The group of all donors may benefit from higher exports if tied aid (granted by some or all donors) mainly results in trade diversion at the expense of non-donors among the recipient’s trading partners.

⁶ In other words, tied aid may be immiserizing (Kemp and Kojima 1985).

The share of aid that is formally tied to donor exports has declined since the 1990s.⁷ Nevertheless, a particular donor may benefit in terms of higher exports if untied aid generates goodwill for the donor in the recipient country (Silva and Nelson 2012). Arvin and Baum (1997: 78) develop a theoretical model in which “a donor maintains a constant flow of untied aid in order to continually replenish its stock of goodwill.”⁸ The donor benefits as the stock of goodwill tends to increase future exports. In a similar vein, Djajić et al. (2004: 151-2) argue that “aid in one period may, as a result of habit-formation or ‘goodwill’ effects, cause a shift in preferences of the recipient country in the following period. Aid can then be seen as an instrument with the power to influence future consumption of the recipient in a direction that is beneficial to the donor.” Djajić et al. (2004) show that, under certain conditions, this intertemporal effect of untied aid resembles the effect of tied aid by improving the donor’s welfare at the expense of the recipient. Moreover, similar to tied aid, goodwill and habit formation might also imply trade diversion among donors as well as between the group of donors and non-donors, rendering predictions on the trade effects of aid still more ambiguous.

The exporters in the donor countries could also benefit from the macroeconomic effects of AfT. Similar to other types of aid, AfT could increase trade by promoting investment and economic growth in the recipient country (McGillivray and Morrissey 1998; Suwa-Eisenmann and Verdier 2007). However, it continues to be heavily disputed whether aid is really growth enhancing.⁹ More importantly in the present context, it is open to debate whether donor countries would reap most of the benefits if trade intensified because of positive growth effects of aid. Principally, this channel should affect exports from donors and non-donors alike, unless the aforementioned goodwill effects result in trade diversion. Furthermore, aid-financed productive investments might also boost recipient exports. As

⁷ The proportion of untied bilateral aid rose from 46% in 1999-2001 to 82% in 2008

(<http://www.oecd.org/development/untyingaidtherighttochoose.htm#progress>; accessed: April 2013).

⁸ As noted by Arvin and Baum (1997), this ‘goodwill hypothesis’ draws on the marketing literature where brand loyalty may be created through advertising and sponsorship.

⁹ Note that even surveys of the relevant literature come to opposing conclusions on the macroeconomic effectiveness of aid (Doucouliagos and Paldam 2009; McGillivray et al. 2006).

explained in more detail in Section 3, building productive capacity in the recipient country represents an important building bloc of the AfT initiative. Cali and Te Velde (2011) note that AfT projects in agriculture and industry may enhance the factor productivity in the recipient country and improve the quality of its export goods. Recipient exports could then be stimulated by a shift in the preferences of trading partners, including the donor countries, toward goods produced in the recipient country.

The skeptics arguing that aid is not effective in promoting growth have often stressed Dutch disease effects as a plausible explanation.¹⁰ Aid inflows can have adverse effects on the recipient country's international competitiveness by giving rise to real exchange-rate appreciation. Consequently, the production of exportables would be discouraged in the recipient country. At the same time, imports would increase. Even though donor countries may supply only part of the additional imports, aid-induced Dutch disease effects would clearly work in favor of donor exports and against recipient exports.

In principle, the reasoning on Dutch disease holds for AfT as much as for other types of aid. Specific categories of AfT (notably AfT related to Trade Policies and Regulations; see Section 3 for details) may be “numerically small and therefore unlikely to precipitate any real exchange rate appreciation” (Helble et al. 2012: 362). But AfT as a whole figures as prominently as other types of aid in various recipient countries.¹¹ All the same, it does not necessarily follow from the Dutch disease argument that AfT benefits donor exports more than recipient exports. Aid-induced real exchange-rate appreciation can generally be mitigated to the extent that aid is spent on imports, rather than non-tradables (Suwa-Eisenmann and Verdier 2007: 502). Furthermore, Adam and Bevan (2006) show that the relationship between aid inflows, real exchange rates, output growth, and recipient exports is less straightforward than simple models of aid suggest. According to Adam and Bevan (2006), export-depressing

¹⁰ Rajan and Subramanian (2011) are a prominent example. Suwa-Eisenmann and Verdier (2007: 485) note that Dutch disease is probably “the most celebrated argument of a relationship between aid and trade flows.”

¹¹ For details, see: <http://stats.oecd.org/qwids/>.

Dutch disease effects tend to be dominated by positive supply-side effects when looking beyond the short term. Specifically, aid-financed public infrastructure generates productivity spillovers which provide an important stimulus to recipient exports.¹²

The argument that improved infrastructure provides an important stimulus to recipient exports commands wide support in the literature.¹³ As specified in Section 3, an important category of AfT explicitly aims at financing better economic infrastructure such as transportation, telecommunication and energy supply. The underlying rationale is that the costs of trading could be reduced in this way. Indeed, some empirical studies find that the infrastructure channel of AfT is effective in promoting recipient exports (Cali and Te Velde 2011; Vijil and Wagner 2012). However, it is often neglected that donor exports, too, could be promoted by better infrastructure. One may even suspect that selfish donors target AfT by selecting infrastructure projects that serve primarily their own export interests. Hence, it is hard to decide *ex ante* whether the effects of AfT related to infrastructure will be stronger on recipient exports than on donor exports.

The same ambiguity prevails with regard to another category of AfT that is related to trade facilitation in a narrower sense (see also Section 3 on Trade Policies and Regulations). This category of AfT aims at reducing administrative costs and regulatory bottlenecks to trade (Cali and Te Velde 2011; Busse et al. 2012).¹⁴ Again, this could induce higher exports from both recipient and donor countries. Lahiri and Raimondos-Møller (1997) and Lahiri et al. (2002) provide theoretical assessments of the strategic effects of foreign aid on the recipient

¹² Using a computable version of their model, Adam and Bevan (2006) simulate the complex effects of an increase in aid inflows. The simulations reveal that positive supply-side effects dominate short-run Dutch disease effects. The authors conclude: “Somewhat paradoxically, growth in aggregate exports and total output in the medium term are strongest when the productivity effects of public investment expenditure are skewed in favor of nontradable production, reflecting the aggregate dynamic gains arising from improvements in nontradable supply” (Adam and Bevan 2006: 263). Note that Adam and Bevan (2006: 272) assume that aid “is used exclusively to finance increased public investment expenditure.”

¹³ For details see Suwa-Eisenmann and Verdier (2007), Helble et al. (2012), Vijil and Wagner (2012), and the literature given in these contributions.

¹⁴ Vijil and Wagner (2012) argue that trade costs related to weak institutions may be reduced in this way. According to Cali and Te Velde (2011), AfT aimed at trade facilitation in the narrow sense had a statistically significant cost-reducing effect on the processing of trade. Busse et al. (2012) report similar findings for the effects of AfT on the costs of trading, while they do not find a close correlation between AfT and the time of trading.

country's trade tariffs. Lahiri et al. (2002) model two-stage games in which the recipient country liberalizes trade after the donor has decided on aid.¹⁵ In other words, AfT could be used by the donors to foster their own trade interests. Lahiri and Raimondos-Møller (1997) consider the situation where (egoistic or altruistic) donors allocate a given amount of aid between competing recipient countries. The authors show that, in contrast to altruistic donors maximizing the collective welfare of the recipient countries, egoistic donors would prefer recipient countries with lower tariff rates on the imports from the donor country. This implies that AfT could have varying effects on donor exports, depending on the motive of the donor country to grant AfT.

Similar to the theoretical literature on aid and trade, most the empirical literature considers aggregate aid flows and trade in just one direction – either from donors to recipients or from recipients to donors. To the best of our knowledge, there are just two recent studies that are more closely related to the present paper. Helble et al. (2012) as well as Pettersson and Johansson (2013) integrate the recipient and donor perspectives by analyzing the effects of aid on bilateral trade in both directions. Helble et al. (2012) explicitly focus on AfT (from all donors taken together) received by the exporting country and/or the importing country in each pair of trading partners. They find that AfT is more strongly associated with the exports of the recipient countries than with the imports of recipient countries, suggesting that AfT improves the balance of payments of recipients. However, the setting in Helble et al. (2012) renders it difficult to identify the relevance of donor interests in granting AfT and to compare the effects of AfT on donor and recipient exports.¹⁶ The study covers bilateral flows between 167 importers and 172 exporters, including trade relations among recipient countries as well

¹⁵ In the case of 'untied' aid, the donor will decide to give aid "only if aid results in a reduction of the recipient's trade tax" (Lahiri et al. 2002: 89).

¹⁶ This comparison can only be derived indirectly from the estimations for specific sub-samples in Helble et al. (2012).

as among donor countries. This implies that donor-recipient pairs represent just a fraction of all pairs of trading partners.

Pettersson and Johansson (2013) consider both trade and aid flows in strictly bilateral terms. They make the important point that bilateral aid is not only positively associated with donor exports to recipients, but also positively associated with recipient exports to donors. However, Pettersson and Johansson (2013) do not systematically test whether the impact of AfT on bilateral trade in one direction is significantly stronger than the impact on bilateral trade in the opposite direction. Furthermore, as noted by Pettersson and Johansson (2013: 687), the strictly bilateral approach offers only limited insights on the effectiveness of AfT from the recipients' viewpoint: "It is arguably the effect of aid on the total and not the bilateral level of exports that is of greatest importance for development."

In contrast to dyadic trade relations considered by Helble et al. (2012) and Pettersson and Johansson (2013), we assess the effects of AfT from all donors of the Development Assistance Committee (DAC) (or subgroups of DAC donors) on the exports and imports of recipient countries to and, respectively, from all donor countries (or subgroups of donors). As detailed in the subsequent section, we estimate nested models in order to identify significantly different effects of AfT on the trade flows in opposite directions. Specifically, we would expect significantly stronger effects on the exports of recipients, compared to the imports of recipients, if AfT was unaffected by the self-interest of donors.

3. Data and method

Data sources and stylized facts on AfT

The empirical analysis in Section 4 is based on data for the 1990-2010 period.¹⁷ We do not use data for the more distant past as the reporting of donors on sector-specific aid was incomplete in earlier years. Aid data were still preliminary for more recent years. We cover all

¹⁷ See also the summary statistic in Appendix 1.

recipient and donor countries listed in the OECD-DAC's International Development Statistics (IDS).¹⁸ The IDS contains the project-based Creditor Reporting System (CRS) and the aggregate DAC statistics on the geographical distribution of financial flows. Following Michaelowa and Weber (2007) and Kretschmer et al. (2013), we combine these two databases to arrive at sector-specific disbursements of AfT.¹⁹

From the CRS we take sector-specific commitments of AfT by donor j to recipient i in sector s and year t , $aft_{sjt}^{com CRS}$. These data on commitments are adjusted to mitigate two potential biases: (i) a potential upward bias as commitments tend to exceed actual disbursements to the extent that donors renege on earlier pledges; (ii) a potential downward bias due to under-reporting of project-based aid in the CRS.²⁰ We account for the first bias by multiplying with the ratio of total aid disbursements over total aid commitments by donor j to recipient i in year t as available from DAC statistics. We account for the second bias by multiplying with the ratio of total aid commitments from DAC statistics over the accumulated project-based commitments as given in the CRS. As is common in the relevant literature, we assume that both biases would affect aid in all specific sectors to the same extent. Aggregating over all donors j , we obtain sector-specific disbursements of AfT:

$$aft_{sit} = \sum_j aft_{sjt}^{com CRS} \frac{aid_{jit}^{disb DAC}}{\sum_s aid_{sjt}^{com CRS}}$$

The sectors s of AfT conform with the official OECD-WTO initiative (OECD 2006).²¹

Accordingly, total AfT comprises the following sectors grouped into three AfT categories: (i)

¹⁸ For details, see: <http://stats.oecd.org/qwids/> (accessed: March 2013). Note that we use aid data as well as trade data in current prices. However, we include time dummies in all our estimations.

¹⁹ Note that aid disbursements are generally preferred over aid commitments in the aid effectiveness literature, while aid commitments are often used in the aid allocation literature. However, sector-specific disbursements are available only for a couple of recent years.

²⁰ Under-reporting has become less serious over time, but cannot be ruled out for the early 1990s.

²¹ See Busse et al. (2012: 147) for more details.

Trade Policies and Regulations (CRS Code 331), *aft_Pol*; (ii) Economic Infrastructure, *aft_Inf*, consisting of Transport and Storage (210), Communications (220), and Energy Generation and Supply (230); (iii) Building Productive Capacity, *aft_Prod*, consisting of Banking and Financial Services (240), Business and Other Services (250), Agriculture (311), Forestry (312), Fishing (313), Mineral Resources and Mining (322), Industry (321), and Tourism (332).

It should be noted that these aid categories existed already prior to the AfT initiative of 2005, even though donors have pledged to commit additional funds since then.²² Throughout the period of observation, *aft_Inf* accounted for most of total AfT (48 percent; Figure 1). In sharp contrast, *aft_Pol* contributed only marginally to AfT. Arguably, the prominence of *aft_Inf* indicates that supporting the recipient countries' export potential is not the only motive underlying AfT. Exporters in the donor country may benefit as much as exporters in the recipient country from this category of AfT, whereas it appears more likely that exporters in the recipient country reap most of the benefits from the other categories of AfT.

Another observation may point to selfish donor motives when providing AfT. The regional distribution of total AfT is skewed towards Asia (Figure 2), where many developing countries tend to be closely integrated into the trading patterns of donor countries. The smaller share of AfT given to African countries is striking from a needs-based perspective considering that “facilitating trade is essential for Africa’s economic development and further integration into the world economy, as business in Africa still suffers from behind-the-border barriers to trade” (Hoekstra 2013: i).²³ Finally, donor countries rated by Berthélemy (2006) to be “egoistic” represent the principal suppliers of AfT. The group of egoistic donors, which

²² As noted by the OECD and WTO (2011), “aid for trade is not a new global fund, nor a new aid category. On the contrary, aid for trade is an integral part of regular official development assistance (ODA).”

²³ According to Nunnenkamp and Thiele (2013), middle-income countries received more than half of AfT in 2002-2009. However, low-income countries account for 58 percent of AfT covered in the present paper when using year-specific World Bank classifications of income groups throughout the 1990-2010 period (not shown).

includes the two biggest donors (the United States and Japan), accounts for more than 75 percent of total AfT.²⁴

The trade data are from the United Nations Comtrade database.²⁵ We follow the approach of Head et al. (2010) as well as Pettersson and Johansson (2013) in that we prefer Comtrade data as reported by the importing country; i.e., we use the imports of country A from country B, instead of the exports of country B to country A, whenever Comtrade reports both series. In rare cases when exports of B to A are larger than imports of A from B or when imports are not reported by country A, we use the corresponding export data if these are reported by country B.²⁶

Data on GDP (GDP_{it}) and population (POP_{it}) are from the World Bank's World Development Indicators (WDI) (<http://data.worldbank.org>). The distance between the recipient country's and the donor countries' most populated agglomerations ($Dist_{ij}$) is taken from the CEPII database to construct our market access variable (see below).²⁷ Finally, we account for WTO membership (WTO_{it}), by drawing on data from Baier and Bergstrand (2007) and Head et al. (2010) as well as on updates available from the WTO's Regional Trade Agreements Information System.²⁸

Estimation approach

Our estimation strategy is based on the gravity model, first introduced in the analysis of international trade by Tinbergen (1962). Since foreign aid is usually flowing from advanced countries to less developed countries we consider an asymmetric version of the model of

²⁴ For details, see Appendix 2. The contribution of AfT to total aid granted by the group of egoistic donors was 21.5 percent throughout the period of observation. AfT contributed the same share to total aid from the group of altruistic donors, though only 15.1 percent to total aid from the group of moderate donors.

²⁵ We downloaded the data in current US\$ according to SITC revision 2 (Standard International Trade Classification) in November 2012 (<http://comtrade.un.org/db/default.aspx>).

²⁶ In these cases, the export data are 'inflated' to account for the fact that import data reported by the importer are typically higher than the corresponding export data reported by the exporter. The adjustment factor is given by the average margin of imports over the corresponding exports.

²⁷ Available at http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=6 (accessed: November 2012). For further description of the data see Mayer and Zignago (2011).

²⁸ http://www.wto.org/english/tratop_e/region_e/region_e.htm (accessed: March 2013)

Anderson and van Wincoop (2003). We aggregate the bilateral components of the gravity model and estimate the following relationship.²⁹

$$Trade_{it} = GDP_{it}^{\beta_1} AfT_{it}^{\beta_2} D_{it}^{\beta_3} \exp(\gamma_1 WTO_{it} + \delta_1 \mu_i + \delta_2 \lambda_t) \quad (1)$$

where $Trade_{it}$ represents either the exports X_{it} of recipient country i in year t to all donor countries j , or the imports M_{it} of recipient country i in year t from all donor countries j ; μ_i are recipient country fixed effects and λ_t are time fixed effects.

AfT_{it} is our explanatory variable of principal interest, defined as total aid for trade (or major sub-categories: aid for economic infrastructure, productive capacity, or trade facilitation) received by country i from all donor countries j . We account for time-variant characteristics of the recipient country, notably its GDP (GDP_{it}),³⁰ and we control for membership in the WTO (WTO_{it}).

Our approach aggregates the trade flows of individual recipient countries over all donor countries. Hence, we construct a proxy on market access and trade costs, D_{it} , for each recipient country, as the weighted sum of trade costs and market opportunities in relation to all donor countries j .

$$D_{it} = \sum_j GDP_{jt}^{\hat{\theta}_1} POP_{jt}^{\hat{\theta}_2} Dist_{ij}^{\hat{\theta}_3} \quad (2)$$

We follow Polak (1996), Redding and Venables (2004) and Warin et al. (2009) and derive D_{it} by using the estimated coefficients of a standard gravity model as weights (see Polak 1996: 535). The auxiliary calculation includes a set of dyadic gravity-type variables which would otherwise be lost due to aggregation, such as $Dist_{ij}$, which is the distance

²⁹ This approach is theoretically well founded. Polak (2006) and Redding and Venables (2004) follow a similar strategy.

³⁰ In an extended specification, we also account for the recipient country's population (POP_{it}).

between recipient i and all donors j . Consequently, D_{it} fully accounts for the factors shaping the demand of recipient i for imports from donors j or, respectively, the supply of exports by recipient i to donors j .

We run pooled regressions for the exports X_{it} and the imports M_{it} , rather than performing separate regressions for exports and imports and comparing the individual results with each other. Pooling exports and imports increases our flexibility to statistically test for differences in the importance of our explanatory variables on trade flows in opposite directions. Note, however, that we introduce two dummy variables: The first is set equal to one for the imports of the recipients and zero otherwise, while the second is set equal to one for the exports of the recipients and zero otherwise. We then interact these dummy variables with AfT and all other explanatory variables, mirroring individual regressions for exports and imports. We formally test for differences between the coefficients of the export and import equation with a Wald test.

4. Results

Results for the overall sample of recipients and donors

We report our baseline results in Table 1. For each explanatory variable we show two coefficients revealing the effects on (i) the exports of recipient country i to all donor countries and (ii) the imports of recipient country i from all donor countries. In addition, the p-values of the Wald test are given in the first line for each explanatory variable to assess whether the two coefficients differ significantly from each other. All explanatory variables are lagged by one year in Table 1.³¹ Regarding our variable of principal interest, we consider total aid for trade (aft_Tot) in columns (1) and (2) before differentiating between the three specific AfT categories, i.e., (economic) infrastructure (aft_Inf) in columns (3) and (4), productive capacity (aft_Prod) in columns (5) and (6), and trade policy and regulations (aft_Pol) in columns (7)

³¹ See below for alternative lags.

and (8). The control variables are the same in the estimations with different AfT categories. However, we estimate two specifications by adding the recipient country's population to the standard set of control variables in columns (2), (4), (6), and (8).

The coefficients on the control variables are mostly as expected. In particular, the recipient country's GDP enters significantly positive at the one percent level in all estimations. This applies to both recipient exports and imports, though the Wald test reveals that the effect is significantly stronger on exports to donor countries. The inclusion of the recipient country's population in the extended specification reported in columns (2), (4), (6), and (8) hardly affects the coefficient on *GDP*. This extension follows Pettersson and Johansson (2013) to distinguish between country size and purchasing power. Country size may be expected to be negatively associated with foreign trade as a larger population offers more possibilities for domestic specialization and exchange. However, *POP* always proves to be insignificant at conventional levels in Table 1. Consequently, we drop *POP* in all subsequent estimations to avoid clutter. The dummy variable on WTO (previously GATT) membership also fails to pass conventional significance levels. This is hardly surprising in the presence of country fixed effects. The variation over time is limited as various recipient countries were WTO members throughout the period of observation.

As noted above, *Market Access* captures market opportunities and trade costs in relation to all donor countries. As expected this variable typically enters significantly positive.³² Somewhat surprisingly perhaps, the effect is considerably stronger when recipient imports are the dependent variable. The coefficient is about twice as large for recipient imports, compared to recipient exports, and the corresponding Wald test is highly significant.

Turning to our AfT variables of major interest, total AfT appears to be effective in promoting trade in both directions according to the results shown in columns (1) and (2) of Table 1. The effects on both recipient exports to donors and recipient imports from donors are

³² However, it loses its significance in the extended specification with *POP* included when the recipient country's exports represent the dependent variable.

significant at the one percent level. In quantitative terms, a doubling of total AfT would imply that recipient exports increase by about five percent and recipient imports increase about three percent. The Wald test for AfT in column (1) reveals that the effect on recipient exports is significantly stronger than the effect on recipient imports, while the corresponding Wald test in column (2) proves to be insignificant. Taken together, the results for total AfT do not support the skeptical view that donors grant AfT primarily to promote their own export interests.³³

This preliminary conclusion also holds when disaggregating total AfT into its three sub-categories. Compared to total AfT, the results are almost the same when considering only AfT meant to improve the recipient country's economic infrastructure (*aft_Inf*) in columns (3) and (4) of Table 1. As concerns AfT for strengthening the recipient country's productive capacity (*aft_Prod*), the coefficients shown in columns (5) and (6) are again similar to those for total AfT. The Wald tests turn out to be somewhat weaker than before, but still suggest that AfT benefits recipient exports to the donor countries at least as much as recipient imports from the donor countries. Interestingly, the smallest AfT category aiming at trade facilitation with respect to trade policy and regulations (*aft_Pol*) appears to be particularly effective. In quantitative terms, the estimates in columns (7) and (8) indicate that a doubling of *aft_Pol* would be associated with a ten percent increase in recipient exports. Doubling *aft_Pol* would involve fairly limited donor funds; it could be achieved, for example, by re-directing about ten percent of *aft_Inf* to *aft_Pol*. It should be noted that trade facilitation through *aft_Pol* also promotes the donors' own export interests. However, the effect on recipient imports from the

³³ As robustness test (available on request), we calculated three-year averages of our AfT variables, instead of annual observations. This modification resulted in quantitatively larger effects of AfT on both recipient exports and recipient imports. Furthermore, the Wald tests then revealed significantly stronger effects on recipient exports independent of whether *POP* is included as an additional right-hand-side variable.

donor countries is considerably weaker than the effect on recipient exports, as revealed by the highly significant Wald tests.³⁴

In the next step of our empirical analysis, we extend the lag of all AfT variables to two years. This modification takes into account that the effects of AfT on trade could be delayed. For instance, infrastructure as well production capacities have to be built and improved, and reforming trade policy and regulations may involve time-consuming bargaining with interest groups. It could be expected that the effects on recipient exports need more time to materialize, while donors may be better equipped to react immediately to aid-induced export opportunities. This could bias the results reported in Table 1 against showing positive effects of AfT on recipient exports, relative to recipient imports. In addition, we mitigate endogeneity concerns by extended lags for our AfT variables.³⁵

The estimations with the modified lag structure are reported in Table 2. As can be seen, the results for the control variables are essentially as before. More surprisingly, the extended lag of total AfT in column (1) of Table 2 hardly affects the previous finding on total AfT in column (1) of Table 1. In particular, we do not find that the extended lag strengthens the effect of total AfT on recipient exports, relative to recipient imports. Nevertheless, the results for the sub-categories of AfT point to two changes compared to the corresponding results in Table 1. On the one hand, the effects of *aft_Inf* on recipient exports and recipient

³⁴ In another robustness test (available on request), we replicated the basic specification (without *POP*) in Table 1 after excluding all recipient countries with a population of less than one million. Aid granted to very small recipient countries often amounts to extremely high shares in government revenue and GDP. At the same time, annual fluctuations are typically particularly large for small recipient countries. This may explain why the statistical fit (overall R^2) of our estimations improves considerably when excluding the smallest recipients. The coefficients on AfT are typically slightly smaller for the reduced sample of recipients, but all coefficients continue to be significant at the five percent level. The Wald tests are no longer significant for total AfT and AfT in infrastructure, while the Wald test continues to be significant at the five percent level for AfT related to trade policy and regulations.

³⁵ We also checked for robustness with GMM estimations to mitigate a potential endogeneity bias. We do not report the GMM results in detail since they are not particularly reliable due to a high instrument count. Collapsing the instrument matrix reduces the instrument validity since this transformation induces a violation of the Blundell-Bond requirement (Blundell and Bond, 1998) that the error term is uncorrelated with the fixed effects. The difference GMM result suffers from a downward bias in the coefficients and displays a lower bound of possible effects. Indeed, the effects of aid for trade turn out to be much weaker than before. Importantly, however, some major findings hold. In particular, we do not find any evidence that the effects on recipient imports are stronger than those on recipient exports. The Wald tests are insignificant. This provides further evidence against the skeptical view that donors grant AfT mainly to promote their own exports.

imports do not differ significantly from each other when *aft_Inf* is lagged by two years. On the other hand, the effects of *aft_Prod* on recipient exports become stronger, relative to the effects on recipient imports, once possible delays in improving the recipient's production capacities are allowed for. The finding for *aft_Pol* carries over almost unchanged from Table 1.

Sub-samples of recipient countries

In the following, we re-estimate our empirical model for various sub-samples of recipient countries. In this way, we assess whether total AfT is particularly effective where it may be needed most. First, we classify all recipient countries into three income groups. Following the World Bank classification, we differentiate between low income countries, lower middle income countries, and upper middle income countries. Recalling that AfT shall help “overcome the supply-side and trade-related infrastructure constraints” (OECD and WTO 2011: 1), one may suspect that AfT would be particularly effective if it benefited low income countries where such constraints typically appear to be most severe. Second, we focus on selected regions. We are particularly interested to evaluate the effects of AfT on the trade relations of recipient countries located in Sub-Saharan Africa – assuming that the world-market integration of many countries in this region is still lagging behind.

Table 3 shows the results for the three income groups. Our AfT variables are lagged by one year in columns (1)-(3), and by two years in columns (4)-(6). Regarding the control variables, the coefficients on *Market Access* continue to be significantly positive when recipient imports are the dependent variable, while they are insignificant with one exception when recipient exports are the dependent variable. Nevertheless, the Wald tests indicate that the effects on imports and exports are significantly different only for the low income group. The recipients' own GDP is positively correlated with both their exports and imports, at the one percent level of significance. The effects of *GDP* on exports and imports are similarly

strong when running the estimation for the lower middle or upper middle income group. By contrast, the effect of *GDP* on the exports of low income countries is significantly stronger than the effect on the imports of this group, which resembles the previous finding for the overall sample of recipient countries.

More strikingly, the effects of total AfT vary considerably between the three income groups. First of all, the significantly positive effects on recipient exports shown above for the overall sample do not hold for the low income group – independent of whether AfT is lagged by one or two years. By contrast, the effects on the imports of the low income group prove to be significantly positive in columns (1) and (4) of Table 3. One may be tempted to conclude that AfT granted to low income recipients is mainly in the self-interest of the donors. However, the insignificant Wald tests suggest that such an interpretation would be premature.

All the same, the findings for the middle income groups add to concerns that AfT may have failed to achieve its objective to overcome supply bottlenecks especially where these appear to be most severe. Compared to the low income group, it appears more likely that AfT stimulates exports of middle income countries – most of which are probably less dependent on aid to overcome supply constraints. AfT once lagged has significantly positive effects on the exports of the lower middle income group, and the Wald test in column (2) points to significantly stronger effects on the exports, relative to the imports, of this group. AfT twice lagged has significantly positive effects on the exports of the upper middle income group. The Wald tests indicate significantly stronger effects on the exports, relative to the imports, of both middle income groups in columns (5) and (6), even though the coefficient on AfT is insignificant for the lower middle income group's exports and imports.

The findings on selected regions in Table 4 point into the same direction.³⁶ Arguably, AfT is needed most in Sub-Saharan Africa to strengthen the recipient countries' integration into world markets. Various Asian countries are well-known to be closely integrated into the

³⁶ Table 4 reports the results when AfT is lagged by one year. The results are hardly affected when AfT is lagged by two years, instead of only one year. The latter results are available on request.

international division of labor, and large parts of Latin America seem to be sufficiently advanced to draw on domestic resources in order to remove remaining bottlenecks. Nevertheless, we find that total AfT is more effective in promoting the exports of East Asia and Latin America than the exports of Sub-Saharan Africa.³⁷ At the same time, it is only for Sub-Saharan Africa that total AfT is positively associated with higher imports from the donor countries, at the one percent level of significance. Again, the insignificant Wald test warns against attributing our result for Sub-Saharan Africa to the self-interest of donors. Yet it is noteworthy that the Wald tests for East Asia and Latin America in columns (1) and (3) of Table 4 suggest that recipient exports reacted more strongly than recipient imports where the need for AfT can reasonably be assumed to be less pressing than in Sub-Saharan Africa.

Altruistic versus selfish donors

While we return to the full recipient sample in this section, the following estimations address the questions of whether the effectiveness of AfT varies between different types of donor countries. We draw on the classification by Berthélemy (2006). The aid allocation model of Berthélemy reveals that the elasticity of bilateral aid with regard to bilateral trade varies considerably across donors. According to his empirical findings, donors are rated to be ‘altruistic’, ‘moderate’, or ‘egoistic’.³⁸ Apart from using this classification to assess differences in the effectiveness of AfT across donors, the results for the group of altruistic donors may also provide valuable information on the severity of possible endogeneity concerns. Reverse causation, i.e., more intensive trade relations between the donor and the

³⁷ Total AfT also enters significantly positive when the exports of the Middle East and North Africa or South Asia are the dependent variable. It should be noted, however, that the number of observations is rather small for these two regions; the same applies to Europe and Central Asia. The substantially reduced number of observations may also explain at least partly why we get weaker or even implausible results for the control variables. For instance, the negative coefficients on the WTO dummy for South Asia and Latin America are counterintuitive.

³⁸ Altruistic donors include (in the order given by Berthélemy 2006): Switzerland, Norway, Austria, Ireland, Netherlands, Denmark, and New Zealand; moderate donors include: Germany, Canada, Finland, and the United Kingdom; egoistic donors include: Japan, the United States, France, Italy, and Australia. Note that Berthélemy (2006) offers alternative options to classify Japan and the United States. Moreover, he does not classify some of the donor countries included in our previous estimations for the full sample.

recipient driving the donor's allocation of AfT, is most unlikely for the altruistic group. Hence, a weaker correlation between AfT and recipient exports for the altruistic group could be taken as an indication that we overstated the effectiveness of AfT in promoting recipient exports in the earlier estimations for the overall sample.

The results shown in Table 5 render it rather unlikely that previous results suffered from serious endogeneity problems. The coefficient on total AfT is statistically insignificant for the group of altruistic donors only when recipient imports are the dependent variable and AfT is lagged by one year in column (1). Considering recipient exports as the dependent variable, AfT granted by altruistic donors proved to be significant and quantitatively important. Dependent on the lag structure, a doubling of total AfT by altruistic donors would imply an increase in recipient exports by almost ten percent and almost eight percent, respectively (columns 1 and 4). Taken the coefficients on AfT at face value, the quantitative effect on recipient exports appears to be stronger for the group of altruistic donors, in particular compared to the group of egoistic donors.

In contrast to what one might have expected, however, Table 5 does not provide evidence that donors classified as egoistic by Berthélemy (2006) have also used AfT mainly to promote their own export interests. Rather, the coefficients on AfT are highly significant independent of whether recipient exports to egoistic donors or recipient imports from egoistic donors are taken as the dependent variable (columns 3 and 6). Moreover, all three donor groups have in common that the Wald tests do not reveal any significant differences in the strength of the effects of AfT on either recipient exports or recipient imports. This invites the conclusion that recipients benefited at least as much from AfT as the donors themselves.

5. Summary and conclusion

The Aid-for-Trade Initiative launched at the WTO Ministerial Conference in 2005 aimed at strengthening the export capacity of developing countries by overcoming supply-side

constraints (OECD and WTO 2011). However, the promotion of recipient countries' exports by AfT cannot be taken for granted. Recent studies offer an ambiguous picture on the effectiveness of foreign aid in this respect. Moreover, the literature on aid for trade (AfT) has often neglected that exporters in the donor countries may be among the main beneficiaries. Donors are widely suspected to use aid as a means to foster their own commercial interests.

We consider an asymmetric and aggregated gravity model to test the hypothesis that AfT is as much in the self-interest of donor countries as it may have promoted the exports of recipient countries. We simultaneously estimate and compare the effects of AfT on trade in both directions over the 1990-2010 period. We test for significantly different effects with a Wald test.

We find that AfT increases recipient exports to donors as well as recipient imports from donors. In quantitative terms, our baseline estimation suggests that a doubling of total AfT would imply that recipient exports increase by about five percent and recipient imports increase by about three percent. The Wald tests indicate that the first effect tends to dominate the latter. This corroborates similar findings by Helble et al. (2012) and contradicts the skeptical view that donors grant AfT primarily to promote their own export interests.

This conclusion also holds when disaggregating AfT into its three subcategories 'economic infrastructure', 'productive capacity' and 'trade policy and regulations'. Interestingly, the third and smallest subcategory appears to be particularly effective: A doubling would be associated with a ten percent increase in recipient exports. This is in line with similar findings by Cali and Te Velde (2011) and Helble et al. (2012). Furthermore, our major results prove to be robust when accounting for delayed effects of AfT on trade. Allowing for longer lags of our AfT variable also helps mitigate possible endogeneity concerns, considering that sufficiently strong instruments are almost impossible to find.

The results achieved for sub-groups of donors render serious endogeneity problems still more unlikely. Reverse causation can be largely ruled out for altruistic donors whose aid

allocation has been shown in previous research to be hardly affected by trade-related self-interest. Hence, a weaker correlation between AfT and recipient exports for the altruistic group might have indicated that we overstated the effectiveness of AfT for the overall sample of donors. However, the quantitative effect of AfT on recipient exports appears to be stronger for the group of altruistic donors, compared to the group of egoistic donors.

All the same, our results point to important limitations in the effectiveness of AfT. Strikingly, the significantly positive effects on recipient exports do not hold for the low income group of recipient countries. AfT rather appears to promote the exports of middle income countries, most of which are probably less dependent on aid to overcome supply constraints. Similarly, we find that AfT is more effective in promoting the exports of East Asia and Latin America than the exports of Sub-Saharan Africa – even though the need for AfT seems to be most pressing in large parts of Sub-Saharan Africa.

It is clearly premature to conclude that the Aid-for-Trade Initiative has failed where external support is needed most. Our analysis covers the relevant aid items but the larger part of our period of observation precedes the official launch of the initiative in 2005. Future research may provide additional insights on whether the donor countries have improved the targeting of AfT once sufficiently long time series covering the post-2005 period become available.

Nevertheless, our analysis points to some tentative policy implications. Most importantly, the effectiveness of AfT may be increased by shifting the focus from projects in infrastructure and production sectors toward support in the field of trade policy and regulations. In the past, the latter category accounted for a small fraction of overall AfT. Consequently, donors could achieve much more for the recipient countries' integration into global trade patterns by raising a relatively small amount of additional funding to help improve the recipients' trade policy and regulations, compared to spending the same amount in infrastructure or production sectors. The donors should also redress the skewed distribution

of AfT in favor of Asia and at the expense of Sub-Saharan Africa. However, targeting AfT more strongly in line with regional needs may be insufficient to ensure greater effectiveness of AfT. It would require refined country-specific criteria to identify where pressing need coincides with local preconditions for an effective use of AfT.

References

- Adam, C.S. and D.L. Bevan (2006). Aid and the supply side: Public investment, export performance, export performance, and Dutch disease in low-income countries. *World Bank Economic Review* 20 (2), 261-290.
- Anderson, J.E. & van E. Wincoop (2003). Gravity with gravitas: A solution to the border puzzle. *American Economic Review* 93(1), 170–192.
- Arvin, M. and C.F. Baum (1997). Tied and untied foreign aid: A theoretical and empirical analysis. *Keio Economic Studies* 34 (2), 71-79.
- Arvin, M., B. Cater and S. Choudhry (2000). A causality analysis of untied foreign assistance and export performance: The case of Germany. *Applied Economics Letters* 7 (5), 315-319.
- Baier, S. and J. Bergstrand (2007). Do free trade agreements actually increase members' international trade? *Journal of International Economics* 71 (1), 72–95.
- Berthélemy, J.-C. (2006). Bilateral donors' interest vs. recipients' development motives in aid allocation: Do all donors behave the same? *Review of Development Economics* 10 (2), 179-194.
- Blundell, R. and S. Bond (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics* 87 (1), 115-143.
- Brenton, P. and E. von Uexkull (2009). Product specific technical assistance for exports – has it been effective? *Journal of International Trade and Economic Development* 18 (2), 235-254.
- Busse, M., R. Hoekstra and J. Königer (2012). The impact of aid for trade facilitation on the costs of trading. *Kyklos* 65 (2), 143-163.
- Cali, M. and D.W. Te Velde (2011). Does aid for trade really improve trade performance? *World Development* 39 (5), 725-740.

- Djajić, S., S. Lahiri and P. Raimondos-Møller (2004). Logic of aid in an intertemporal setting. *Review of International Economics* 12 (1), 151-161.
- Doucouliagos, H. and M. Paldam (2009). The aid effectiveness literature: The sad results of 40 years of research. *Journal of Economic Surveys* 23 (3), 433-461.
- Head, K., T. Mayer and J. Ries (2010). The erosion of colonial trade linkages after independence. *Journal of International Economics*, 81(1): 1-14.
- Helble, M., C.L. Mann and J.S. Wilson (2012). Aid-for-trade facilitation. *Review of World Economics* 148 (2), 357-376.
- Helpman, E., M. Melitz and Y. Rubinstein (2008). Estimating trade flows: Trading partners and trading volumes. *Quarterly Journal of Economics* 123 (2), 441-487.
- Hoeffler, A. and V. Outram (2011). Need, merit, of self-interest – what determines the allocation of aid? *Review of Development Economics* 15 (2), 237-250.
- Hoekstra, R. (2013). Boosting manufacturing firms' exports? The role of trade facilitation in Africa. IEE Working Paper 197. University of Bochum.
- Kemp, M.C. and S. Kojima (1985). Tied aid and the paradoxes of donor-enrichment and recipient-improvement. *International Economic Review* 26 (3), 721-729.
- Kretschmer, B., M. Hübler and P. Nunnenkamp (2013). Does foreign aid reduce energy and carbon intensities of developing economies. *Journal of International Development* 25 (1), 67- 91.
- Lahiri, S. and P. Raimondos-Møller (1997). Competition for aid and trade policy. *Journal of International Economics* 43 (3-4), 369-385.
- Lahiri, S., P. Raimondos-Møller, K. Wong and A.D. Woodland (2002). Optimal foreign aid and tariffs. *Journal of Development Economics* 67 (1), 79-99.
- Lloyd, T., M. McGillivray, O. Morrissey and R. Osei (2000). Does trade create trade? An investigation for European donors and African recipients. *European Journal of Development Research* 12 (1), 107-123.

- Martínez-Zarzosa, I., F. Nowak-Lehmann D., S. Klasen and M. Larch (2009). Does German development aid promote German exports? *German Economic Review* 10 (3), 317-338.
- Mayer, T. and S. Zignago (2011). Notes on CEPII's distances measures: The GeoDist database.
CEPII Working Paper 2011-25.
- McGillivray, M. and O. Morrissey (1998). Aid and trade relationships in East Asia. *World Economy* 21 (7), 981-995.
- McGillivray, M., S. Feeny, N. Hermes and R. Lensink (2006). Controversies over the impact of development aid: It works; it doesn't; it can, but that depends.... *Journal of International Development* 18 (7), 1031-1050.
- Michaelowa, K. and A. Weber (2007). Aid effectiveness in the education sector: a dynamic panel analysis. In S. Lahiri (Ed.), *Theory and practice of foreign aid*. Amsterdam: Elsevier (pp. 357-385).
- Munemo, J. (2011). Foreign aid and export diversification in developing countries. *Journal of International Trade and Economic Development* 20 (3), 339-355.
- Munemo, J., S. Bandyopadhyay and A. Basistha (2007). Foreign aid and export performance: A panel data analysis of developing countries. In S. Lahiri (Ed.), *Theory and practice of foreign aid*. Amsterdam: Elsevier (pp. 421-433).
- Nilsson, L. (2004). Aid and donor exports: The case of the European Union. In F. Columbus (Ed.), *Asian economic and political issues. Vol. 10*. New York: Nova Science Publ. (pp. 59-79).
- Nowak-Lehmann D., F., I. Martínez-Zarzosa, S. Klasen and D. Herzer (2009). Aid and trade: A donor's perspective. *Journal of Development Studies* 45 (7), 1184-1202.

- Nowak-Lehmann D., F., I. Martínez-Zarzosa, D. Herzer, S. Klasen and A. Cardozo (2013). Does foreign aid promote recipient exports? *Review of World Economics*, forthcoming.
- Nunnenkamp, P. and R. Thiele (2013). Financing for development: The gap between words and deeds since Monterrey. *Development Policy Review* 31 (1), 75-98.
- OECD (2006). Aid for Trade: Making it Effective. Organization for Economic Co-Operation and Development Publishing: Paris.
- OECD and WTO (2011). Aid for trade: Showing results. Policy Brief. http://www.oecd.org/dac/aft/Policy_brief_AfT_Showing_Results.pdf (accessed: March 2013).
- Osei, R., O. Morrissey and T. Lloyd (2004). The nature of aid and trade relationships. *European Journal of Development Research* 16 (2), 354-374.
- Pettersson, J. and L. Johansson (2013). Aid, aid for trade, and bilateral trade: An empirical study. *Journal of International Trade and Economic Development* 22 (6), 866-894.
- Polak, J. J. (1996). Is APEC a natural regional trading bloc? A critique of the 'gravity model' of international trade. *The World Economy* 19 (5), 533-543.
- Rajan, R.G. and A. Subramanian (2011). Aid, Dutch disease, and manufacturing growth. *Journal of Development Economics* 94 (1), 106-118.
- Redding, S. and J. Venables(2004). Economic geography and international inequality. *Journal of International Economics* 62 (1), 53-82.
- Silva, S.J. and D. Nelson (2012). Does aid cause trade? Evidence from an asymmetric gravity model. *World Economy* 35 (5), 545-577.
- Suwa-Eisenmann, A. and T. Verdier (2007). Aid and trade. *Oxford Review of Economic Policy* 23 (3), 481-507.
- Tajoli, L. (1999). The impact of tied aid on trade flows between donor and recipient countries. *Journal of International Trade and Economic Development* 8 (4), 373-388.

- Tinbergen, J. (1962). *Shaping the World Economy: Suggestions for an International Economic Policy*. New York: Twentieth Century Fund.
- Vijil, M. and L. Wagner (2012). Does aid for trade enhance export performance? Investigating the infrastructure channel. *World Economy* 35 (7), 838-868.
- Wagner, D. (2003). Aid and trade: An empirical study. *Journal of the Japanese and International Economies* 17 (2), 153-173.
- Warin, T., P. V. Wunnava and H. Janicki, (2009). Testing Mundell's intuition of endogenous OCA theory. *Review of International Economics* 17(1), 74–86.

Figure 1 – Major categories of aid for trade, all DAC countries, 1990-2010 (US\$ million, current prices)

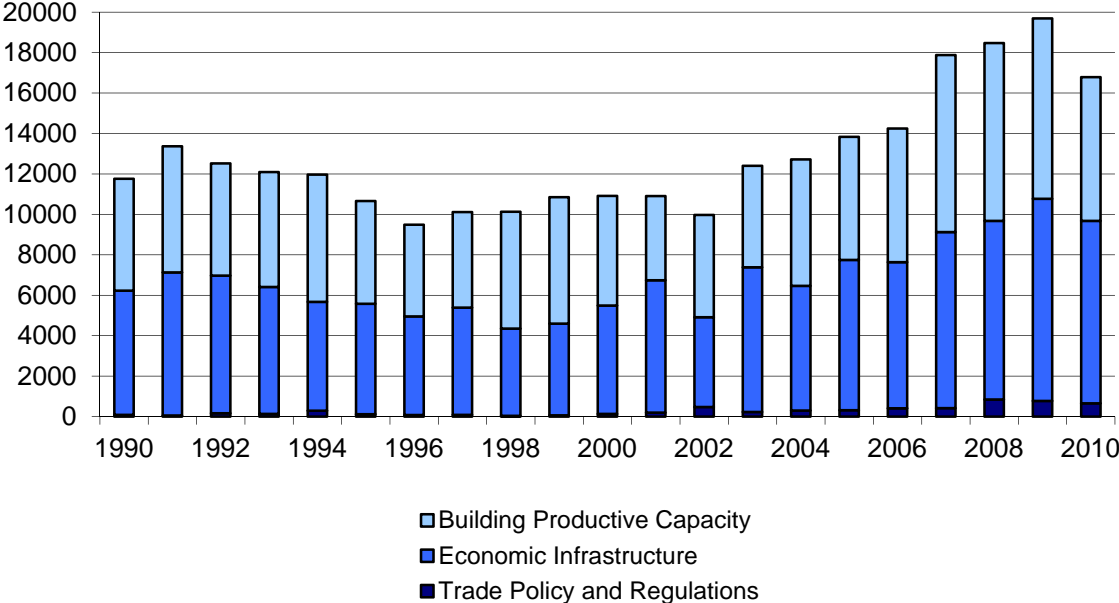


Figure 2 – Regional distribution of aid for trade, all DAC countries, 1990-2010

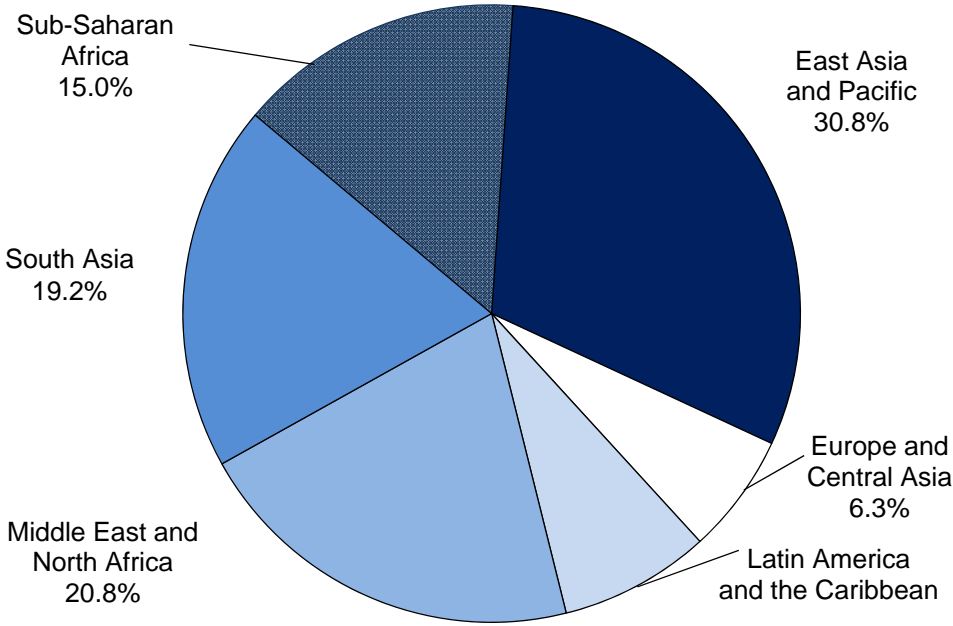


Table 1 – Effects of aid for trade on recipient exports and imports: Baseline results, total sample

Variables	AfT Total		Infrastructure		Productive Capacity		Trade Policy	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Aid for Trade								
<i>Wald test</i>	0.090	0.112	0.078	0.101	0.142	0.165	0.021	0.021
Exports	0.0503*** (0.0156)	0.0496*** (0.0156)	0.0534*** (0.0174)	0.0523*** (0.0173)	0.0519*** (0.0169)	0.0513*** (0.0168)	0.101*** (0.0267)	0.101*** (0.0268)
Imports	0.0290*** (0.00963)	0.0295*** (0.00944)	0.0282*** (0.0104)	0.0291*** (0.0101)	0.0320*** (0.0110)	0.0325*** (0.0108)	0.0476*** (0.0181)	0.0478*** (0.0178)
GDP								
<i>Wald test</i>	0.017	0.023	0.018	0.024	0.016	0.022	0.017	0.024
Exports	0.698*** (0.120)	0.694*** (0.121)	0.697*** (0.120)	0.693*** (0.121)	0.701*** (0.119)	0.696*** (0.120)	0.697*** (0.118)	0.692*** (0.120)
Imports	0.475*** (0.0532)	0.478*** (0.0531)	0.474*** (0.0530)	0.478*** (0.0529)	0.476*** (0.0532)	0.479*** (0.0532)	0.475*** (0.0528)	0.478*** (0.0527)
Population								
<i>Wald test</i>		0.166		0.169		0.162		0.156
Exports		0.300 (0.562)		0.293 (0.562)		0.311 (0.563)		0.327 (0.564)
Imports		-0.230 (0.313)		-0.233 (0.314)		-0.224 (0.314)		-0.213 (0.317)
WTO								
<i>Wald test</i>	0.965	0.966	0.973	0.960	0.966	0.965	0.982	0.949
Exports	0.0833 (0.124)	0.0872 (0.124)	0.0853 (0.124)	0.0890 (0.125)	0.0832 (0.125)	0.0872 (0.125)	0.0872 (0.124)	0.0914 (0.125)
Imports	0.0868 (0.0698)	0.0839 (0.0691)	0.0880 (0.0700)	0.0851 (0.0694)	0.0865 (0.0700)	0.0837 (0.0694)	0.0891 (0.0705)	0.0864 (0.0698)
Market Access								
<i>Wald test</i>	0.016	0.003	0.017	0.004	0.020	0.004	0.022	0.005
Exports	0.476* (0.277)	0.381 (0.325)	0.509* (0.275)	0.416 (0.324)	0.514* (0.275)	0.415 (0.326)	0.567** (0.275)	0.462 (0.324)
Imports	0.979*** (0.168)	1.052*** (0.218)	1.003*** (0.165)	1.076*** (0.216)	0.997*** (0.165)	1.069*** (0.217)	1.037*** (0.162)	1.106*** (0.214)
Observations	5,366	5,366	5,366	5,366	5,366	5,366	5,366	5,366
Number of id	284	284	284	284	284	284	284	284
overall R2	0.0997	0.0748	0.102	0.0758	0.107	0.0793	0.111	0.0815

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Heteroscedastic robust standard errors are used. Country and year fixed effects are included in each specification. The average trade cost and market access is calculated using the weights of Polak (1996). All variables are reported in logs.

Table 2 – Effects of aid for trade on recipient exports and imports: Total sample, AfT lagged twice

Variables	AfT Total (1)	Infrastructure (2)	Productive Capacity (3)	Trade Policy (4)
Aid for Trade				
<i>Wald test</i>	0.072	0.140	0.044	0.023
Exports	0.0460*** (0.0152)	0.0429*** (0.0162)	0.0545*** (0.0166)	0.110*** (0.0261)
Imports	0.0236** (0.00929)	0.0226** (0.0102)	0.0272** (0.0104)	0.0563*** (0.0187)
GDP				
<i>Wald test</i>	0.009	0.008	0.008	0.008
Exports	0.705*** (0.116)	0.706*** (0.115)	0.706*** (0.116)	0.703*** (0.115)
Imports	0.457*** (0.0525)	0.457*** (0.0523)	0.457*** (0.0525)	0.456*** (0.0524)
WTO				
<i>Wald test</i>	0.888	0.884	0.891	0.858
Exports	0.111 (0.132)	0.112 (0.132)	0.111 (0.132)	0.118 (0.131)
Imports	0.0993 (0.0725)	0.0997 (0.0726)	0.0991 (0.0727)	0.103 (0.0724)
Market Access				
<i>Wald test</i>	0.007	0.009	0.008	0.010
Exports	0.465* (0.276)	0.504* (0.273)	0.487* (0.273)	0.536** (0.269)
Imports	1.045*** (0.171)	1.064*** (0.170)	1.058*** (0.169)	1.081*** (0.165)
Observations	5,130	5,130	5,130	5,130
Number of id	284	284	284	284
overall R2	0.0794	0.0841	0.0815	0.0872

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Heteroscedastic robust standard errors are used. Country and year fixed effects are included in each specification. The average trade cost and market access is calculated using the weights of Polak (1996). All variables are reported in logs.

Table 3 – Effects of total aid for trade on recipient exports and imports: Income groups of recipients

Variables	AfT, lagged once			AfT, lagged twice		
	Low income (1)	Lower middle (2)	Upper middle (3)	Low income (4)	Lower middle (5)	Upper middle (6)
Aid for Trade						
<i>Wald test</i>	0.934	0.016	0.476	0.825	0.036	0.024
Exports	0.0412 (0.0255)	0.0337* (0.0171)	0.0520 (0.0483)	0.0255 (0.0257)	0.0286 (0.0193)	0.0850* (0.0460)
Imports	0.0392*** (0.0126)	0.00306 (0.0149)	0.0322 (0.0330)	0.0308** (0.0117)	-0.00119 (0.0153)	0.0216 (0.0338)
GDP						
<i>Wald test</i>	0.056	0.124	0.556	0.057	0.116	0.726
Exports	0.844*** (0.178)	0.600*** (0.209)	0.696*** (0.216)	0.820*** (0.190)	0.612*** (0.221)	0.659*** (0.225)
Imports	0.561*** (0.0793)	0.365*** (0.121)	0.588*** (0.107)	0.511*** (0.0838)	0.361*** (0.128)	0.587*** (0.110)
WTO						
<i>Wald test</i>	0.104	0.514	0.475	0.134	0.672	0.712
Exports	0.322 (0.269)	0.0163 (0.168)	0.0238 (0.121)	0.334 (0.290)	0.0517 (0.186)	0.0465 (0.122)
Imports	0.0514 (0.144)	0.0926 (0.0975)	0.117 (0.0723)	0.0597 (0.150)	0.108 (0.105)	0.0961 (0.0744)
Market Access						
<i>Wald test</i>	0.017	0.204	0.703	0.014	0.197	0.707
Exports	-0.0230 (0.346)	0.965* (0.569)	0.536 (0.475)	0.0334 (0.377)	0.973 (0.609)	0.551 (0.512)
Imports	0.743*** (0.197)	1.441*** (0.406)	0.690*** (0.229)	0.898*** (0.213)	1.486*** (0.439)	0.711*** (0.235)
Observations	2,162	2,084	1,044	2,066	1,984	1,008
Number of id	148	184	102	146	182	100
overall R2	0.0482	0.0884	0.636	0.0381	0.0808	0.564

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Heteroscedastic robust standard errors are used. Country and year fixed effects are included in each specification. The average trade cost and market access is calculated using the weights of Polak (1996). All variables are reported in logs.

Table 4 – Effects of total aid for trade on recipient exports and imports: Regional groups of recipients

Variables	East Asia and Pacific (1)	Europe and Central Asia (2)	Latin America and the Caribbean (3)	Middle East and North Africa (4)	South Asia (5)	Sub-Saharan Africa (6)
Aid for Trade						
<i>Wald test</i>	0.0137	0.4869	0.0510	0.0263	0.2924	0.2087
Exports	0.0757**	0.0426	0.0456*	0.0709*	0.0493*	0.00825
	(0.0345)	(0.0461)	(0.0245)	(0.0335)	(0.0254)	(0.0275)
Imports	0.00425 (0.0310)	0.0204 (0.0212)	0.00843 (0.0151)	0.0276 (0.0215)	0.0190 (0.0388)	0.0407*** (0.0143)
GDP						
<i>Wald test</i>	0.1031	0.0420	0.9643	0.0343	0.0181	0.0101
Exports	0.987** (0.378)	0.482 (0.306)	0.517*** (0.147)	-0.374 (0.406)	-0.173 (0.406)	0.866*** (0.142)
Imports	0.612** (0.243)	0.173 (0.222)	0.524*** (0.0676)	0.170 (0.203)	0.884*** (0.200)	0.518*** (0.0511)
WTO						
<i>Wald test</i>	0.906	0.959	0.004	0.310	0.010	0.301
Exports	0.252 (0.236)	0.0781 (0.344)	-0.278** (0.134)	0.144 (0.291)	-1.038*** (0.188)	0.131 (0.191)
Imports	0.233 (0.168)	0.0896 (0.138)	0.0207 (0.0775)	-0.0678 (0.119)	-0.531** (0.158)	-0.0221 (0.119)
Market Access						
<i>Wald test</i>	0.053	0.653	0.904	0.027	0.104	0.013
Exports	-0.470 (0.939)	2.711** (0.975)	0.708** (0.330)	3.213** (1.174)	1.725 (1.019)	-0.00864 (0.327)
Imports	0.717 (0.721)	2.901*** (0.711)	0.673*** (0.120)	1.750** (0.628)	-0.0887 (0.760)	0.804*** (0.189)
Observations	866	604	1,278	566	298	1,754
Number of id	48	32	64	30	16	94
overall R2	0.0692	0.242	0.778	0.0163	0.000736	0.0332

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Heteroscedastic robust standard errors are used. Country and year fixed effects are included in each specification. The average trade cost and market access is calculated using the weights of Polak (1996). All variables are reported in logs.

Table 5 – Effects of total aid for trade on recipient exports and imports: Altruistic, moderate and egoistic donors

Variables	AfT, lagged once			AfT, lagged twice		
	Altruistic (1)	Moderate (2)	Egoistic (3)	Altruistic (4)	Moderate (5)	Egoistic (6)
Aid for Trade						
<i>Wald test</i>	0.174	0.190	0.259	0.435	0.100	0.319
Exports	0.0969** (0.0432)	0.0654*** (0.0244)	0.0509*** (0.0184)	0.0769* (0.0432)	0.0724*** (0.0258)	0.0384** (0.0186)
Imports	0.0368 (0.0282)	0.0336** (0.0152)	0.0325*** (0.00987)	0.0473** (0.0234)	0.0335** (0.0162)	0.0217** (0.00961)
GDP						
<i>Wald test</i>	0.826	0.002	0.018	0.734	0.003	0.011
Exports	0.478*** (0.173)	0.0691 (0.0985)	0.753*** (0.124)	0.428** (0.182)	0.0657 (0.109)	0.758*** (0.118)
Imports	0.509*** (0.101)	0.465*** (0.0662)	0.501*** (0.0484)	0.478*** (0.103)	0.467*** (0.0618)	0.483*** (0.0468)
WTO						
<i>Wald test</i>	0.631	0.066	0.739	0.555	0.046	0.760
Exports	0.154 (0.276)	-0.130 (0.0887)	0.114 (0.120)	0.211 (0.300)	-0.123 (0.0899)	0.121 (0.127)
Imports	0.0611 (0.133)	0.0628 (0.0679)	0.0791 (0.0643)	0.0875 (0.142)	0.0839 (0.0652)	0.0866 (0.0650)
Market Access						
<i>Wald test</i>	0.361	0.000	0.037	0.276	0.000	0.019
Exports	1.246*** (0.285)	-0.313 (0.202)	0.380 (0.322)	1.331*** (0.296)	-0.308 (0.215)	0.401 (0.313)
Imports	1.018*** (0.177)	0.692*** (0.154)	0.914*** (0.190)	1.052*** (0.185)	0.682*** (0.143)	1.033*** (0.198)
Observations	2,901	4,888	5,288	2,777	4,668	5,054
Number of id	150	258	280	150	258	280
overall R2	0.0863	0.114	0.118	0.0487	0.118	0.0905

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Heteroscedastic robust standard errors are used. Country and year fixed effects are included in each specification. The average trade cost and market access is calculated using the weights of Polak (1996). All variables are reported in logs.

Appendix 1 – Summary Statistics, full sample, 1990-2010

Variables	Observations	Mean	Standard Deviation	Min	Max
Exports	2926	10166.52	48861.62	0.011696	1093347
AfT Total	3033	18.42578	90.96874	0	2246.817
aft_Pol	3025	1.083984	8.302099	0	342.1906
aft_Inf	3032	8.967887	44.60353	0	825.3317
aft_Prod	3033	8.38849	55.76573	0	1813.133
GDP	2899	59426.41	246122	8.824746	5930530
POP	3024	34.35767	137.5465	0.009004	1337.825
WTO	3045	0.6187192	0.4857811	0	1
Market_Access	3003	4.60E+09	1.59E+09	1.67E+09	1.12E+10
Imports	2928	7835.644	30016.67	0.0082127	681875.7
AfT Total	3033	18.42578	90.96874	0	2246.817
aft_Pol	3025	1.083984	8.302099	0	342.1906
aft_Inf	3032	8.967887	44.60353	0	825.3317
aft_Prod	3033	8.38849	55.76573	0	1813.133
GDP	2899	59426.41	246122	8.824746	5930530
POP	3024	34.35767	137.5465	0.009004	1337.825
WTO	3045	0.6187192	0.4857811	0	1
Market_Access	3003	4.60E+09	1.59E+09	1.67E+09	1.12E+10

Note: The summary statistics are conditional on AfT being non-negative.

Appendix 2 – AfT Statistics, donor classification according to Berthélemy (2006), 1990-2010

	Observations	Mean	Standard Deviation	Min	Max	Sum
Altruistic Donors						
AfT total	1617	1.511424	4.833902	0	79.33475	2444.101
aft_Pol	1615	0.1767327	0.6874684	0	8.6662	285.4234
aft_Inf	1615	0.7181665	2.931929	0	57.38281	1159.839
aft_Prod	1617	0.617711	2.3203	0	24.65913	998.8387
Moderate Donors						
AfT total	2727	3.184608	15.28065	0	242.4149	8688.260
aft_Pol	2721	0.2256135	2.019166	0	89.17106	613.8942
aft_Inf	2726	1.699894	9.829125	0	240.4159	4633.911
aft_Prod	2727	1.261626	7.717899	0	181.426	3440.455
Egoistic Donors						
AfT total	2991	13.83348	85.30098	0	2246.817	41391.318
aft_Pol	2985	0.7549406	8.000401	0	342.1873	2253.498
aft_Inf	2991	6.61402	41.31768	0	825.3317	19782.53
aft_Prod	2991	6.4712	54.3736	0	1813.1330	19355.290

Note: The summary statistics are conditional on AfT being non-negative.