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Aid for Trade Facilitation

Matthias Helble
Catherine Mann
John S. Wilson

The World Bank
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Trade and Integration Team
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Abstract

Does foreign aid spent on trade facilitation increase trade flows of developing countries? There is an on-going and high profile discussion of aid-for-trade associated with the Doha negotiations of the World Trade Organization. There continue also questions about how best to achieve the Millennium Development Goals. The analysis in this paper explicitly considers how to target aid most effectively to increase trade – a fundamental question related to the crisis and policy debate over restarting the world trading system. Using detailed data on aid flows from the OECD, the analysis here estimates the responsiveness of trade flows to specific types of foreign aid. The findings indicate that aid directed toward promoting trade enhances the trade performance of recipient countries: a 1 percent increase in aid directed toward trade policy and regulatory reform (amounting to about US$11.7 million more such aid) could generate an increase in global trade of about US$818 million. This yields a "rate of return" on every dollar of this type of aid of about US$697 in additional trade. As the dollar aid flow is relatively small, such targeted aid mitigates concerns about absorptive capacity and real exchange rate appreciation, which may accompany larger disbursements.

This paper—a product of the Trade and Integration Team, Development Research Group—is part of a larger effort in the department to explore the linkages between trade costs, facilitation, and economic development with support through the Multidonor Trust Fund for Trade and Development. The project website is accessible at: http://econ.worldbank.org/projects/trade_costs. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at helblem@who.int, clmann@brandeis.edu , and jswilson@worldbank.org.

Aid for Trade Facilitation

Matthias Helble[1], Catherine Mann[2], and John S. Wilson[3,4]

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[1] Technical Officer, Department of Ethics, Equity, Trade and Human Rights, World Health Organization helblem@who.int.
[2] Professor of International Economics and Finance, International Business School, Brandeis University; clmann@brandeis.edu .
[3] Lead Economist, in the Development Research Group — Trade, The World Bank Group: jswilson@worldbank.org.
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I. Introduction

This paper brings together two strands of research to examine the specific question of whether foreign aid directed toward the trade facilitation agenda has increased trade of developing countries. The two strands of research are first, the relationship between trade facilitation and trade flows, and the second is the relationship between aid flows and trade flows. We wish to marry these two lines of research because of the increasingly important constellation of issues surrounding trade, aid, and development policies, as well as the increased attention to aid effectiveness and aid-for-trade in trade negotiations and other multilateral forums. The main strength of our approach is that we use detailed data on types of aid flows, which allows us to examine the relationship between aid-and-trade according to different classifications of the type of aid extended and received.

The linkages between trade facilitation, trade, and development are relatively simple in theory. Development is enhanced through income growth, which comes from the expansion of trade, investment, and production opportunities. Trade facilitation initiatives, with the aim of lowering trade transactions costs, can enhance trade competitiveness, and expand trade flows, while at the same time playing an important role in supporting a positive business climate.

In practice, implementing trade facilitation initiatives involves the domestic reform agenda, private sector priorities, and national development strategies. Trade facilitation reform requires self-assessment, technical assistance, and capacity building. In other words, trade facilitation reforms are difficult to do and cost money.

Hence, with greater attention to the potential gains to trade facilitation reforms has come greater attention to how to enable and finance those reforms. The trade facilitation agenda is part of the Doha Development Round of the World Trade Organization. Other multilateral institutions and other groups have established task forces and research programs to understand better the impact of trade facilitation reform on development, how lower trade costs affect trade, and, importantly for this research paper, what role aid and technical assistance have in supporting development and poverty reduction goals.[5]

Empirical research on trade facilitation has largely focused on the question: What is trade facilitation and how does it work to enhance trade? A number of studies provide strong evidence that improvements in trade-facilitation— for example improvement in port and information infrastructure, more rapid customs clearance time, or regulatory reform to remove duplicative technical requirements on imports have a positive impact on trade

[5] One example of a public private dialogue on trade facilitation reform is the Global Partnership for Transport and Trade which brings together international agencies in trade facilitation, such as the United Nations Conference on Trade and Development (UNCTAD), World Bank, and World Customs Unions (for more information: http://www.gfptt.org). The World Bank has had an on-going research project on the relationships between trade facilitation and trade performance, http://econ.worldbank.org/projects/trade_costs

performance.[6] Case study evidence complements econometric work, and explores the cost and complexity of implementing comprehensive reform at the country level. Our analysis seeks to further inform discussion on these topics and addresses specifically what role aid directed toward trade facilitation reforms can play to expand trade.

The majority of studies conducted on aid and trade find a positive relationship between aid and trade. The direction of causality is unclear, however, as development funding from developed to developing countries has been historically tied back to developed countries in some manner (and some aid remains tied in this manner). [7] Moreover, the relationship between aid and growth is complex with the significance, direction of causality, and sign of the relationship subject to debate, in part because of how aid can impact trade through real exchange rates. Does targeting aid more explicitly to certain kinds of policies mitigate these concerns?

In bringing together the strands of the literature on trade facilitation and trade, and on aid and trade, our research in this paper finds strong empirical evidence that aid directed to the trade facilitation reform agenda has a small, but significant and positive impact on trade flows. The bulk of the relationship between aid and trade appears to come from a narrow set of aid flows directed toward trade policy and regulatory reform, rather than broader aid-for-trade categories directed toward sectoral trade development or infrastructure development. Therefore, we suggest that, starting from the composition of aid flows that we observe today, relatively small additions to the aid flow that are directed toward the trade policy and regulatory reform agenda could have high effectiveness to increase trade of the recipient countries, and around the world.

The paper is organized as follows: In the next section, we review the literature on trade facilitation and on aid and trade, as our analysis links these two parts of the economic literature. In section three, we discuss the data and empirical methods employed here. Section four summarizes the estimation results including several robustness checks. Section five concludes.

II. Literature Review

The empirical literature relevant for our study can be divided in two parts. First is the literature that investigates the impact of trade facilitation on trade flows. A quick review of this literature helps us better understand how trade facilitation measures enhance the integration of developing countries into the trading system and global markets. Second is the literature that relates aid to trade and more broadly to economic growth. We reference here in this paper some of the important contributions to understanding these

[6] For a compendium of research and analysis on trade facilitation and economic development see; http://econ.worldbank.org/projects/trade_costs

[7] See Wagner (2003) for a recent overview of tied aid and Nelson (2007) for a literature review on the trade-aid debate. See also Morrissey, 1991; McGillivray and Morrissey, 1998; Lloyd et al., 2000; Osei et al., 2004.

linkages and discuss the literature as it relates to our analysis. This review provides context as to why our more focused approach makes a contribution to understanding the relationship between aid on trade flows and on the question of aid effectiveness.

The literature on trade facilitation (TF) and trade is relatively new and has proceeded along three paths: (1) Econometric analysis of one area of TF for a set of countries, (2) econometric modeling of multiple areas of TF and multiple countries, and (3) case studies of TF in a single-country setting.

The advantage of deep analysis of one type of TF is that researchers can bring to bear extensive granularity in the data, such as density of firms next to major roads to ports, or number of web-hosts, or aflatoxin regulations, and investigate the impact of changes in those specific TF aspects on trade prospects of one or a group of countries. [8] But, such deep, but narrow investigations cannot determine whether the specific TF aspect being investigated is the most important factor underpinning a country's trade flows because the specific TF area is not analyzed in a comparative setting inclusive of other areas of potential TF reform.

A second line of inquiry utilizes econometric modeling of trade effects (using either CGE or gravity models) of TF reforms in multiple countries. The CGE approach usually proxies TF with trade cost or productivity parameters, but there is little mapping of these generalized parameters into areas of TF reform.[9] Therefore, we know that lower trade costs enhance trade, but not through which TF channels.

The gravity models incorporate more TF areas (hard infrastructure such as ports and soft infrastructure such as regulatory adherence, among others) and thus allow for more distinction about which areas of TF reform relate to the greater gains in trade.[10] Decomposing the country set into regions or different levels of income (as in Wilson, Mann, Otsuki, 2005) shows that for some countries and some regions, investment in infrastructure is strongly related to trade, whereas for other countries or regions,

[8] For example, research that focuses on TF efforts in the area of ports and transportation includes Hummels (2001), Clark, X., D. Dollar and A. Micco. (2002); and Shepherd and Wilson (2007) on road network quality. Fink, Mattoo, and Neagu (2002a) address anticompetitive practices in port services; and Hausman, Lee, and Subramanian (2005), and Nordis, Pinali, Grosso (2006) consider logistics and shipping time; and most recently a comprehensive look at ports and related infrastructures in IADB (2008). Analysis of other specific aspects of trade facilitation include Freund and Weinhold (2000) on the Internet; Fink, Mattoo, and Neagu (2002b) on communication costs; Moenius (2000, 2004) on bilaterally shared standards and Chen, et al (2006) on meeting foreign standards, and Shepherd and Wilson (2007) on standards in textiles, clothing, and footwear; Otsuki, Wilson, and Sewadeh (2001a, 2001b) on food safety standards. In addition, see Hausman, Warren H.; Lee, Hau L.; and Subramanian, Uma. 2005. "Global Logistics Indicators, Supply Chain Metrics, and Bilateral Trade Patterns." World Bank Policy Research Working Paper No. 3773 (November).

[9] CGE with TF proxied by trade cost or productivity parameters including, APEC (1999), UNCTAD (2001), Walkenhorst and Yasui (2003).

[10] Gravity models incorporating border and behind-the-border TF measures, including Wilson, Mann, Otsuki (2003, 2005); OECD (2005); Francois and Manchin (2007). Soloaga, Wilson, Mejia. (2005) evaluate the sectoral impact of changes in trade facilitation measures in Mexico. See also Bouet, Mishra, Roy (2008) for Africa.

improvements in soft infrastructure (regulatory reform) are more strongly related to trade flows.

The majority of econometric empirical studies on the topic of trade facilitation conclude that improvements in trade facilitation measures are associated with increases in trade flows. The various trade facilitation measures examined --streamlining customs procedures, improving port efficiency, harmonizing to international standards, and other reforms —work through different channels to lower trade costs for importers and exporters.[11] For some countries, the trade gains from reforms can exceed estimated trade gains from tariff reductions. [12]

These econometric studies have focused on the gains from trade facilitation—but how costly are these gains to obtain? Duval (2006) gathers expert opinions on the costs and benefits of twelve different types of trade facilitation measures. According to the experts consulted, the long-term benefits greatly exceed the cost for implementation of all measures. An alternative approach to explore the costs and benefits of trade facilitation is case study analysis. [13] Case studies of TF reforms in specific countries are valuable as they can explicitly address and estimate the costs of engaging in detailed reform and also consider the benefits of specific reform measures. The question of the cost of reform is a key component that links the two parts of our paper and provides the rationale for this work.

There is also research on the question of aid and economic growth more generally. This literature is extensive; and the analytical methods and the results subject to significant debate. A comprehensive review of this literature is beyond the scope of this paper. It is useful, however, to highlight some of the complexities in analyzing the relationships between aid, trade, and growth.[14]

With regard to aid and trade, debate continues on the causality of the two variables. Until the late 1990s a considerable share of official development aid was tied to donor trade. Thus, any positive trade-aid relationship could be due to endogenous policy decisions made in donor countries. Indeed, researchers have found strong links between foreign aid and donor exports with an elasticity of greater than one in a gravity model.[15]

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[11] There may as well be broad-based domestic benefits, through, for example, improved road and ICT networks, improved institutions, and reduced corruption, although these research papers do not address these domestic benefits directly.

[12] For example see; Hummels, David; Minor, Peter; Reisman, Matthew; and Endean, Erin. 2007. "Calculating Tariff Equivalents for Time in Trade." Prepared for USAID Bureau of Economic Growth, Agriculture and Trade under Contract No. GS-10F-0619N, Task Order No. EEM-M-00-06-00028-00. Arlington, VA: Nathan Associates Inc.

[13] Specific countries and specific types of TF reforms, including for example the country studies in Wilson, Mann, Pau, Assanie, Choi (2002) Moise (2003)

[14] Suwa-Eisenmann and Verdier (2007) provide a complete and excellent overview of the topic.

[15] For example, Nilsson (1997) observes for trade between the EU and recipient countries that $1 of aid generated $2.6 of exports from donor to recipient for the period 1975 to 1992. Wagner finds that increasing aid to a country by 1 % increases the donor exports to the recipient by 1.33 %. Other researchers have explored additional links that may exist between the donor and recipient that may lead to additional trade,

Endogeneity could run the other direction—from trade to aid—in that some donors allocate aid to those countries with whom they have the strongest trade ties.[16] Analysis that tests for the direction of causality generally conclude that it depends on the pair of donor and recipient countries.[17] Even if endogenous, the results suggest a positive relationship between aid and trade.

The literature on aid and growth disagrees on whether there is a positive relationship between aid and growth.[18] There may be many reasons for this, including the type of aid delivered (for example, humanitarian vs. policy relevant) and absorptive capacity in developing countries. [19] One reason cited for the lack of a positive relationship between aid and growth is an aid-induced appreciation of real exchange rates—e.g. the aid-induced Dutch disease or the 'transfer paradox'.[20] Since the real exchange rate is a key channel through which aid for trade gains could be eroded, we are concerned about this issue in the context of our study of aid for trade facilitation.

Recent surveys conclude that the econometric estimates of whether aid induces a "Dutch disease" phenomenon can vary widely. This depends upon assumptions about the marginal productivity of additional aid and public expenditures, the complementarities between public and private capital, and the degree of flexibility of labor and other key resources.[21] In addition, Devarajan et al. (2008), using a CGE model, argue that an aid-induced real exchange rate appreciation is more likely if aid flows are volatile and thereby induce sub-optimal consumption and investment planning over time.

How does our paper bring together these two major research strands to address questions about the impact of aid on trade? The main purpose of our study is to evaluate the impact of aid flows targeted for trade facilitation measures on trade flows. We link "aid-for-trade facilitation" flows to trade flows through the black box that relates aid to trade facilitation reform: Certain types of aid flows promote certain reforms or change certain infrastructures which reduce trade transaction costs and thus enhance trade flows. We address the issue of causality by considering a subset of official development assistance, as well as through robustness checks. The issue of aid-induced Dutch disease, while relevant in a broader context, is not likely to be an issue in our analysis. Aid delivered for trade facilitation goals examined here, in contrast to other aid objectives, is numerically small and therefore very unlikely to precipitate any real exchange rate appreciation.

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such as political or economic considerations (Lloyd et al., 2000). But also, see Nelson and Silva (2008) for a recent analysis that obtains much smaller number using a fixed effects gravity model estimation.

[16] Morrissey, 1993; Osei et al., 2004

[17] Lloyd et al. (2000) as well as Arvin et al. (2000).

[18] See Rajan and Subramanian (2005a) for a survey and new assessment.

[19] See Radelet, Clemens, Bhavnani (2005), Chapter 4 in OECD (2006).

[20] The effect is well known: aid flows may be used to finance expenditures of non-tradable goods and services, leading to a rise of their relative price with respect to tradable goods and thus, to a real appreciation of the exchange rate. This causes a significant squeeze on the exporting sector, as resources are transferred from the tradable to non-tradable sectors.

[21] See Adam (2006), Radelet, Clemens and Bhavnani (2006),Rajan and Subramanian (2005b), Chatterjee and Turnovsky (2005).

Two previous studies are similar to our analysis here. These studies focus not on various types of trade facilitation aid, however, (which affects both imports and exports), but on projects that focus on export promotion only. Brenton and von Uexkull (2009) evaluate whether technical assistance in export development programs have been successful. The authors find that on average these programs have induced a stronger export performance in the targeted products. With respect to the effectiveness of export promotion agencies (EPAs), Lederman, Olarreaga, and Payton (2006) find that EPAs, on average, have a positive and statistically significant impact on exports. Nevertheless, they find that the impact is heterogeneous across regions: larger effects were found in Latin American and Asian agencies, while agencies in Sub-Saharan African, the Middle East and North Africa lag behind.

To summarize, while there have been efforts to analyze the mechanisms behind trade facilitation and to show how aid and trade are related, to our knowledge no study as yet has made the link between the two. Our study shows how aid directed towards trade facilitation measures may be related to trade flows. Given the increased focus on aid in the trade negotiating context, as well as the increased interest in aid effectiveness, it makes sense to take a look at these links. The next section discusses the data and methodology.

III. Data and Methodology

III.1. Data

The key ingredient of this paper is the disaggregated data on aid flows. Data on aid flows for the years 1990 to 2005 come from the OECD Creditor Reporting System (OECD-CRS) database, which documents Official Development Aid (ODA) flows from donor to recipient countries starting in the year 1973. This database is very comprehensive and covers almost every country of the world. It includes aid extended by about 40 individual country donors as well as multilateral agencies. Each entry contains the value of the aid flow from donor to the recipient including a description of the aid according a specific classification system (both in words and five digit code). According to the WTO/OECD (2006) almost US $ 8.7 billion (in 2005) or 21.3 % of all ODA (excluding debt relief) was directed towards the Aid-for-Trade agenda, which is the focus of our analysis.[22]

The OECD-CRS reporting system map data into three categories that match the Aid-for-Trade agenda. [23]

1) *Trade policy and regulation* (US$ 296 million in 2005)[24]: Comprises aid flows to facilitate the participation in multilateral trade negotiations and to improve the

[22] The Aid-for-Trade agenda originated in the single-undertaking of the Uruguay Round, developed in the context of the Integrated Framework (IMF, ITC, UNCTAD, UNDP, WTO, OECD/DAC as an observer), and then received further impetus in the Gleneagles G8 summit and WTO ministerial in Hong Kong in 2005.

[23] See Appendix for the full CRS classification for the three functional areas.

implementation of multilateral trade agreements. Furthermore, it contains all support to mainstream trade policy, including technical standards, customs regimes, and tariff structure.

2) *Trade development* (US$ 2910 million in 2005): This category covers business development and activities aimed at improving the business climate, access to trade finance, and trade promotion in the sectors of agriculture, forestry, fishing, industry, mining, tourism, and services.

3) *Economic infrastructure* (US$ 5586 million in 2005): All aid flows directed towards the improvement of the infrastructure for transport, storage, communications and energy.

For our study, all three categories are relevant for trade facilitation. But, a key objective of our study is to investigate which type of aid-for-trade-facilitation has been particularly effective, so we consider alternative aggregations of aid flows using the raw data from the OECD-CRS. Our aggregations are chosen to better match the trade facilitation reforms in the literature typified by Wilson, Mann, Otsuki (2003, 2005). The appendix presents the correspondence between categories and codes used by the OECD-CRS and the four classifications that we use.

1) ***Narrow*** trade facilitation (US$ 296 million in 2005) includes all five digit codes belonging to *Trade Policy and Regulations* (chapter 331, as explained in the Appendix). This narrow agenda focuses on both border (customs, TBT, RTAs) and behind the border (SPS, TRIPS) reforms found by the trade facilitation research to be importantly related to trade flows.

2) ***Broad*** trade facilitation (US$ 8495 million in 2005), which sums up the aid flows from the other two categories, *Trade Development* and *Economic Infrastructure.* This broad category includes both border (ports, roads) and services (telecoms, finance) infrastructures shown by the trade facilitation research to be importantly related to trade. This category also includes sector-specific initiatives.

3) ***Hard*** trade facilitation (US$ 6086 million in 2005) includes aid directed towards investment into infrastructure projects, such as upgrading of ports and construction of new roads. Most of the hard aid is also classified as broad aid, but there are some projects in the broad category that we classify as soft projects, specifically those related to the banking and financial services and training services that are sector-focused.

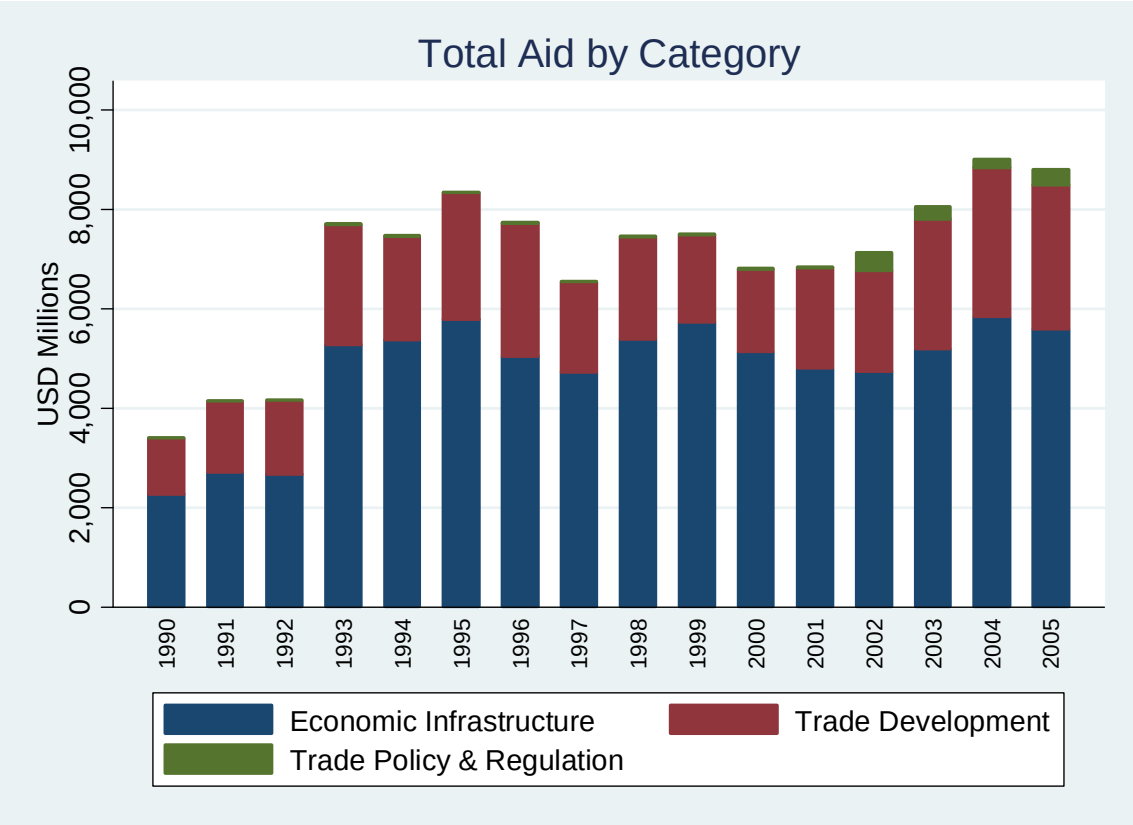
4) ***Soft*** trade facilitation (US$ 2705 million in 2005) includes funds directed toward building institutional capacity related to trade, such as a training of customs officials, streamlining custom procedures, projects related to banking

[24] See WTO/OECD (2006) for definitions, and values of aid flows for 2005.

and finance, and projects that deliver education and training, whether general or sector-focused.

We include distributed aid flows for the same 16 years, 1990 to 2005, as for the trade flows.[25] Figure 1 shows the relative magnitudes of these categories of flows and how they change from 1990 to 2005. As shown, funding for ***broad trade facilitation*** (economic infrastructure and trade development) accounts for about 96 % of aid-for-trade facilitation in 2005. In the same year, ***hard trade facilitation*** projects account for about 70 % of aid-for-trade facilitation. We can see in Figure 1 that the shares of broad vs. narrow (and hard versus soft) have hardly changed over time. Although the importance of trade policy and regulation (our ***narrow*** category**)** increased through 2005 this category remains very small. [26]

Figure 1: *Aid for Trade Facilitation by Category, 1990-2005*



The gravity equation approach that we use requires some additional variables. Overall, our data set combines information from four different sources: the World Integrated Trade Solution (WITS) database for trade flows and tariffs, the Centre d'études prospectives et d'informations internationales (CEPII) database for bilateral data (such as distances between trading partners) and country-specific data (such as a country's area),

[25] The limitation to sixteen years stems from the availability of consistent trade data.
[26] In fact, the Appendix table shows that both the amount and share of disbursements of this category of aid were smaller in 2007 than 2005.

the World Development Indicators (WDI) dataset for GDP and population data, as well as the OECD-CRS for aid flows.

From WITS, we include 115,230 positive trade flows for 167 importers (reporters) and 172 exporters (partners) for the years 1990 to 2005. Tariff data for effective applied rates (simple average) are included from the TRAINS database where available, and where the data are unavailable, the closest year's data are chosen with older data chosen in the event of a tie. Information is included for each EU member as an individual country, as well as the EU as a whole. The CEPII data on distances was simply joined to the trade data.[27] Yearly data from the WDI on GDP (in USD at then current price levels) and population as well as data from CEPII about other country-specific data (such as area or language) was added to the corresponding countries and then also joined to the trade data.

III.2. Methodology

Our methodology is the popular gravity model equation, which has only gotten more popular since the micro-foundations proposed by Anderson and van Wincoop (2003, 2004). From basic microeconomic principles, they derive a gravity-like model of exports from country *i* to country *j* in sector *k* (X_{ij}^k):

(1) $\log\left(X_{ij}^k\right)=\log\left(E_j^k\right)+\log\left(Y_i^k\right)-\log\left(Y^k\right)+\left(1-\sigma_k\right)\log\left(t_{ij}^k\right)-\left(1-\sigma_k\right)\log\left(P_j^k\right)-\left(1-\sigma_k\right)\log\left(\Pi_i^k\right)+\varepsilon_{ij}^k$

Where Y_i^k is the output of country *i* in sector *k*; E_j^k stands for the expenditure of country *j* in sector *k*; Y_t^k denotes aggregate (world) output in sector *k*; σ_k is the elasticity of substitution in sector *k*; t_{ij}^k are trade costs facing exports from country *i* to country *j* in sector *k*; $\omega_{i,j}^k$ = Country *i's/j's* output share in sector *k;* and finally ε_{ij}^k stands for the random error term, satisfying the usual assumptions.

The main innovation in Anderson and van Wincoop's work is the inward and outward resistance terms. The inward resistance term $\left(P_j^k\right)^{1-\sigma_k}=\sum_{i=1}^{N}\Pi_i^{\sigma_k-1}\omega_i^k\left(t_{ij}^k\right)^{1-\sigma_k}$ takes into account that *j*'s imports from *i* depend on trade costs across all exporters. The outward resistance term $\left(\Pi_i^k\right)^{1-\sigma_k}=\sum_{j=1}^{N}P_j^{\sigma_k-1}\omega_j^k\left(t_{ij}^k\right)^{1-\sigma_k}$ describes, by analogy, that the exports from *i* to *j* are affected by the trade costs across all importers.

The data requirements for the multilateral resistance terms exceed what is generally available, so the standard solution is to use fixed-effects estimation. Fixed-effects could be country-specific (for each importer and exporter) or bilateral fixed effects (for each bilateral country pair in the sample). Bilateral fixed effects capture many of the standard

[27] In order to create distance data for the EU, we simply used Luxembourg's geographical data. We consider this assumption as appropriate taking into account that Luxembourg is centrally located within Europe and very close to the geographic center of the EU15.

variables included in gravity equations, such as distance, language, colonial ties. Since our research exploits the time series variation in the trade and aid data to investigate the relationship, we incorporate both time fixed effects as well as time-varying bilateral fixed effects. The time dimension of the time-varying bilateral fixed effects is an average over five years. As we use yearly aggregate trade flows, a time variation by year would not be feasible. In other words, for every pair of countries we have three time-varying (for the years 1990-1994, 1995-1999, and 2000-2005) bilateral fixed effects.

We are now able to postulate that bilateral imports t_{ijt} are a function of the country-specific variables and our baseline empirical specification therefore takes the following form:

(2)
$$\log\left(t_{ijt}\right) = \alpha_{ijT} + \beta_1 \log\left(Y_{it}\right) + \beta_2 \log(Y_{jt}) + \beta_3 \log\left(1+\tau_{it}\right) + \beta_4 ITFA_{it} + \beta_5 ETFA_{jt} + \gamma_t + \varepsilon_{ijt}$$

α_{ijT} denotes all bilateral 5-years fixed effects between country *i* and *j*. Y_{it} and Y_{jt} measure the GDP in both countries in year *t*. The importer's applied tariff is $\left(1+\tau_{ijt}\right)$. The aid for trade facilitation flows received in year *t* by the importer is denoted as $ITFA_{it}$, whereas $ETFA_{jt}$ measures the aid received by the exporter. These aid flows represent the sum of aid received from bilateral donors.[28] γ_t stands for the year fixed effects and ε_{ijt} is the residual. The following section presents the estimation results for the model developed above and conducts several robustness tests in order to test the validity of our results.

IV. Estimation Results

In this section, we consider several different permutations of our main specification. The first step is simply to establish whether aid for trade facilitation is related to trade flows. The second step considers whether this relationship is different for different country groups, in particular focusing on the tied-aid issue. The third question relates to lagged effects of aid. Finally, we consider how the relationship between aid for trade facilitation and trade might vary with the type of aid flow.

IV.1. Main Specification and Disaggregations

Table 1 shows estimation results using bilateral non-zero trade data and several different permutations of countries receiving aid-for-trade facilitation flows over the years 1990 to 2005. In the first two columns, trade between all 167 exporters and 172 importers in our sample is considered. The common variables, such as GDP and tariff, have the expected signs and magnitude. The two variables that capture that amount of aid for trade facilitation received (*ln_itfa*: aid received by importers and *ln_etfa*: aid received by

[28] We exclude multilateral aid flows as it is rather difficult to contribute multilateral aid flows to certain countries. In addition, multilateral A4TF amounted to less than one sixth of all A4TF in all years.

exporters) are both positive and strongly significant. The magnitude is higher for the importing than for the exporting country and is rather small (0.004 vs 0.002). Column (2) is a robustness check on the inclusion of real GDP per capita for importers and exporters. The significance level of our variables of interest changes only slightly, the magnitude of the import coefficient is a bit lower, but the sum of the coefficient estimates is about the same.

There are several additional ways to cut the data to determine to what extent aid for trade facilitation (A4TF) might affect trade. Column (3) narrows the sample to just recipients of A4TF and investigates whether the relationship between A4TF and trade is more apparent. In this select sample of countries, receiving A4TF is more strongly and significantly associated with exports, but not with imports from other A4TF countries. Column (4) continues to consider only the aid recipients, but broadens the possible trading partners to all partners. The export coefficient is smaller than for the select country group, but bigger than the baseline specification of countries, and it appears that A4TF facilitates imports from countries that are not A4TF recipients with a higher elasticity than in the baseline specification of countries.

On balance, the significance of the A4TF coefficients are relatively robust across these various permutations of which countries receive aid and trade with each other. Based on the column (1) estimate (which is the relatively more conservative coefficient estimate), a 1 % increase in aid for trade facilitation (about US$ 88 million in 2005) would yield an increase of global trade of about US$ 415 million.

Table 1: Baseline Estimation Results (Bilateral 5-Years Fixed Effects and Year Fixed Effects Included)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Baseline – all positive trade	Baseline with per capita GDP	Only countries receiving A4TF	Recipients only; trade with recipients & ROW	Recipients with developing world only	Recipients with developing & bilateral donor; no intra-donor trade	Base-line (2) with lags
ln_tariff	-0.199***	-0.199***	-0.247**	-0.218***	-0.214***	-0.200***	-0.210***
	[0.035]	[0.035]	[0.105]	[0.048]	[0.043]	[0.036]	[0.075]
ln_rep_gdp	0.709***	1.561***	-4.599***	0.722	1.482***	1.506***	3.744***
	[0.045]	[0.323]	[1.289]	[0.486]	[0.466]	[0.327]	[1.022]
ln_part_gdp	0.255***	-0.704***	-7.281***	-2.380***	-1.496***	-0.760***	-0.084
	[0.036]	[0.271]	[1.746]	[0.497]	[0.413]	[0.275]	[0.614]
ln_itfa	**0.004*** **	**0.003** **	**0.029**	**0.006** **	**0.003***	**0.003** **	**0.002**
	[0.001]	[0.001]	[0.041]	[0.002]	[0.002]	[0.001]	[0.003]
ln_etfa	**0.002***	**0.002** **	**0.088** **	**0.005***	**0.000**	**0.002** **	**0.002**
	[0.001]	[0.001]	[0.036]	[0.003]	[0.002]	[0.001]	[0.002]
ln_rep_gdp_cap		-0.853***	5.202***	-0.042	-0.671	-0.797**	-3.348***
		[0.320]	[1.273]	[0.477]	[0.452]	[0.324]	[1.032]

ln_part_gdp_cap		0.964***	7.618***	2.632***	1.628***	1.019***	0.376
		[0.265]	[1.732]	[0.486]	[0.402]	[0.269]	[0.602]
L.ln_itfa							0.002
							[0.004]
L2.ln_itfa							0.006
							[0.004]
L.ln_etfa							0.003*
							[0.002]
L2.ln_etfa							0.001
							[0.001]
Observations	108,304	107,806	12,214	51,652	57,855	104,644	32592

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Includes Bilateral 5-years fixed effects and year fixed effects

As part of our analysis we also examine whether the import effect may be due to tied-aid or because aid facilitates imports from rich (and therefore more likely donor) economies. First, we remove the donor economies completely from the sample (column 5). We observe that A4TF has facilitated imports from other developing countries, however, our regression result suggests that there was no effect on exports directed to the latter group. A4TF flows thus do not seem to have boosted trade among developing countries taken as a whole group (not just A4TF recipients). So, 'south-south' trade does not appear to benefit particularly from aid for trade facilitation.

We then include the bilateral flows between the recipient economies, other developing countries and the donors, but exclude intra-donor trade flows (column (6)). When intra-donor trade is completely removed from the sample, the significance of A4TF for exporters returns. So, aid for trade facilitation may be more positively associated with exports to donor economies than to other developing countries.

Column (7) investigates whether time lags affect the efficacy of aid flows. One might argue that aid does not become effective immediately, but only after a certain period of time. Introducing time lags reduces the sample size due to several gaps in the aid flow data. Running the OLS regression with time and bilateral fixed effects on this smaller sample, yields coefficient magnitudes similar in profile to columns (1) and (2), but coefficients on the aid flows are not generally statistically significant.

In sum, the evidence suggests that aid for trade facilitation is positively related to both exports and imports of the recipients, that the relationship to importer's trade flows is somewhat larger (which could indicate that aid flows to donors continues to be important). On the other hand, when considering trade between recipients and donors, excluding intra-donor trade, the relationship between aid and exports is relatively larger than the relationship between aid and imports suggesting the importance of A4TF for enabling exports to the developed world.

IV.2. Narrow vs. Broad and Soft vs. Hard Aid for Trade Facilitation

Twenty-three different types of aid for trade facilitation are incorporated into the OECD-CRS category *Trade Policy and Regulations,* which is our ***narrow*** category of aid for trade facilitation, totaling a bit less than US$ 300 million in 2005. In the other two trade-related aid categories (*Trade Development* and *Economic Infrastructure*), which correspond to our ***broad*** definition, there are eighty-three categories of aid, totaling just under US$8.5 billion. Why bother to investigate this distinction between broad and narrow?

The Trade Policy and Regulations/narrow type of aid assistance is targeted explicitly towards enhancing the trade policy system in countries—their ability to navigate TBT, SPS, and TRIPS. These types of aid flows are focused on customs, transparency, and government procurement. Aid is directed toward learning to negotiate market access, implement RTAs, address dispute settlement, and accession issues. Thus, this type of aid for trade facilitation is narrowly focused on the country as it directly interacts with the trading system itself. Therefore, this aid might have a relatively bigger effect on trade flows because it is targeted directly to trading system issues. Table 2 compares the key coefficients for the ***narrow*** definition of aid-for-trade-facilitation and for the ***broad*** definition of aid-for-trade-facilitation flows.

Using the same country groupings and specifications as in Table 1, Table 2 shows that A4TF, of both types, generally is positively related to trade flows. In the top panel (***narrow*** definition) in columns (1) and (2) the estimated coefficients are again highly statistically significant and positive. The magnitude of the coefficients is somewhat higher than those in Table 1. In addition, the coefficients relating ***narrow*** aid flows to exports are generally larger than those for imports, when both are significant. The bottom panel considers the much larger ***broad*** A4TF category yields results that suggest that A4TF focused on these ***broad*** categories are more strongly related to imports and generally not related to exports.

The observation that aid targeted to *Trade Policy and Regulations*—the ***narrow*** definition of A4TF—is positively associated with exports whereas ***broad*** A4TF is positively associated with imports is notable. It seems to be intuitive that it is difficult to apply policies for trade development and economic infrastructure in a way that favors one type of trade flows. However, trade policy and regulations—the narrow targeted aid—may more directly attempt to expand exports without offering the same treatment to incoming trade flows. For example, the narrow definition of aid flows focuses on implementing RTAs, which can present a challenge for market access for exporters.

Another difference between the two types of aid is the implied economic magnitude. Given the much smaller dollar value of the aid included in regressions with the narrow definition, it is apparent that the 'bang for the buck' of these types of aid-for-trade facilitation programs could be more economically significant. Taking the coefficients in column (4) (sum to 0.018), suggests that a 1 % increase in extensions of narrowly targeted aid (just US$ 3 million) could be associated with an increase in trade of some

US$ 711 millions (0.018*amount of trade in 2005)—a much bigger 'trade bang for the aid buck'.

Table 2: Narrow vs. Broad Definition (Bilateral 5-Year Fixed Effects and Year Fixed Effects Included)

	1	2	3	4	5	6	7
	Baseline – all positive trade	Baseline with per capita GDP	Only countries receiving A4TF /1/	Recipients only; trade with recipients & ROW	Recipients with developing world only	Recipients with developing & bilateral donor; no intra-donor trade	Base-line (2) with lags
Narrow Aid Definition							
ln_itfa	**0.005*** **	**0.004** **	**-0.005**	**0.007** **	**0.003**	**0.004** **	**0.001**
ln_etfa	**0.004*** **	**0.005*** **	**0.011**	**0.011*** **	**0.002**	**0.005*** **	**0.004**
L.ln_itfa							0.005
L2.ln_itfa							0.004
L.ln_etfa							0.006**
L2.ln_etfa							0.001
Broad Aid Definition							
ln_itfa	**0.011*** **	**0.011*** **	**-0.023**	**0.017*** **	**0.013*** **	**0.011*** **	**0.010***
ln_etfa	**-0.001**	**-0.001**	**0.021**	**-0.001**	**-0.005***	**-0.001**	**0.002**
L.ln_itfa							0.059***
L2.ln_itfa							0.004
L.ln_etfa							0.003
L2.ln_etfa							-0.001

Robust standard errors in brackets; includes Bilateral 5 year fixed effects, year effects

* significant at 10%; ** significant at 5%; *** significant at 1%

See appendix tables for all coefficients

In Table 3 we consider ***hard*** vs. ***soft*** aid flows. ***Soft*** aid (such as education and training, administration and management, and aid for trade policy and regulatory adherence) is positively and significantly associated with more imports, but more often then not is not related to exports. A4TF directed toward ***hard*** infrastructure (such as ports, but also industry-sectoral targeted aid programs) is mixed in terms of relationship to trade, and often appears to not statistically related to trade flows.

A key aid category that is in both ***soft*** and ***broad*** relates to the financial sector. Thus, reconciling these various results points to additional research on the role that trade finance plays in trade.

Table 3: Soft vs. Hard Definition (Bilateral 5-Year Fixed Effects and Year Fixed Effects Included)

	1	2	3	4	5	6	7
	Baseline – all positive trade	Baseline with per capita GDP	Only countries receiving AfTF /1/	Recipients only; trade with recipients & ROW	Recipients with developing world only	Recipients with developing & bilateral donor; no intra-donor trade	Base-line (2) with lags
Soft Aid Definition							
ln_itfa	**0.004***	**0.004***	**0.068****	**0.024*****	**0.004**	**0.004**	**0.024*****
ln_etfa	**-0.002**	**-0.002**	**0.057***	**-0.009**	**-0.007****	**-0.002**	**0.000**
L.ln_itfa							0.046***
L2.ln_itfa							0.020***
L.ln_etfa							0.002
L2.ln_etfa							0.004
Hard Aid Definition							
ln_itfa	**0.004***	**0.004**	**-0.012**	**0.015*****	**0.005**	**0.004**	**0.017****
ln_etfa	**0.002**	**0.002**	**0.047****	**0.001**	**0**	**0.001**	**-0.001**
L.ln_itfa							0.058***
L2.ln_itfa							0.003
L.ln_etfa							-0.005
L2.ln_etfa							0.006*

Robust standard errors in brackets; includes bilateral 5 year fixed effects, year effects

* significant at 10%; ** significant at 5%; *** significant at 1%

See appendix tables for all coefficients

IV.3. Robustness Checks and Analysis

A robustness check, as well as to compare with other research, is to examine the results using a standard gravity model specification without the fixed effects specification. Table 4 indicates that a more standard approach to the gravity specification (including various dummy variables and distance for example) gives somewhat different results. Coefficients on the aid variables tend to be larger, particularly when trade between recipients is considered (compare column (3) and (5), and aid flows appear to be negatively related to imports when lags are considered (column 7). Thus, specification is an important concern when examining the potential role for aid to enhance trade.

Table 4: Aid for Trade Facilitation: Gravity Model with Dummy Variables

	(1) Baseline – all positive trade	(2) Baseline with per capita GDP	(3) Only countries receiving AfTF /1/	(4) Recipients only; trade with recipients & ROW	(5) Recipients with developing world only	(6) Recipients with developing & bilateral donor; no intra-donor trade	(7) Base-line (2) with lags
ln_dist	-1.117***	-1.110***	-1.318***	-1.162***	-1.331***	-1.136***	-0.912***
	[0.009]	[0.009]	[0.033]	[0.015]	[0.013]	[0.009]	[0.013]
ln_tariff	-0.141***	-0.246***	-0.320***	-0.300***	-0.245***	-0.252***	-0.356***
	[0.021]	[0.022]	[0.066]	[0.030]	[0.027]	[0.022]	[0.040]
ln_rep_gdp	1.085***	1.169***	1.107***	1.202***	1.116***	1.184***	1.198***
	[0.004]	[0.006]	[0.027]	[0.009]	[0.009]	[0.006]	[0.010]
ln_part_gdp	1.269***	1.244***	1.195***	1.322***	1.271***	1.254***	1.196***
	[0.004]	[0.006]	[0.026]	[0.009]	[0.008]	[0.006]	[0.008]
ln_itfa	**0.009*** **	**0.000**	**0.125*** **	**0.002**	**0.006*** **	**0.000**	**-0.016*** **
	[0.001]	[0.001]	[0.019]	[0.002]	[0.001]	[0.001]	[0.003]
ln_etfa	**0.012*** **	**0.015*** **	**0.219*** **	**0.011*** **	**0.011*** **	**0.015*** **	**0.011*** **
	[0.001]	[0.001]	[0.020]	[0.002]	[0.001]	[0.001]	[0.002]
comcol	1.004***	0.974***	0.794***	0.832***	0.980***	0.966***	1.292***
	[0.034]	[0.034]	[0.075]	[0.043]	[0.037]	[0.034]	[0.077]
curcol	-0.897**	-0.958**	0.000	-3.119***	-3.085***	-1.009**	-0.007
	[0.412]	[0.409]	[0.000]	[1.118]	[0.551]	[0.405]	[0.256]
comlang_off	0.892***	0.912***	0.936***	0.830***	0.657***	0.926***	0.936***
	[0.019]	[0.019]	[0.060]	[0.028]	[0.030]	[0.020]	[0.028]
contig	1.076***	1.057***	1.255***	1.264***	1.114***	1.171***	0.833***
	[0.048]	[0.048]	[0.111]	[0.076]	[0.053]	[0.049]	[0.071]
smctry	0.876***	0.882***	0.638***	0.805***	0.605***	0.774***	1.171***
	[0.067]	[0.067]	[0.151]	[0.100]	[0.071]	[0.068]	[0.112]
ln_area_rep	-0.117***	-0.169***	-0.197***	-0.186***	-0.165***	-0.181***	-0.191***
	[0.004]	[0.005]	[0.020]	[0.008]	[0.007]	[0.005]	[0.008]
ln_area_part	-0.096***	-0.078***	0.022	-0.098***	-0.116***	-0.081***	-0.052***
	[0.004]	[0.005]	[0.020]	[0.008]	[0.007]	[0.005]	[0.006]
ln_rep_gdp_cap		-0.167***	-0.054	-0.154***	-0.142***	-0.179***	-0.330***
		[0.009]	[0.037]	[0.014]	[0.013]	[0.009]	[0.017]
ln_part_gdp_cap		0.046***	0.227***	0.005	-0.014	0.043***	0.068***
		[0.008]	[0.037]	[0.013]	[0.012]	[0.008]	[0.011]
L.ln_itfa							0.002
							[0.003]
L2.ln_itfa							-0.006**
							[0.003]
L.ln_etfa							0.006***
							[0.002]
L2.ln_etfa							0.009***
							[0.002]

Observations	108304	107806	12214	51652	57863	104631	44351
R-squared	0.688	0.69	0.596	0.658	0.608	0.673	0.698

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

V. Conclusion

This paper links the literature on trade facilitation and trade with analysis on aid and trade. We ask the question "to what extent is aid directed toward trade facilitation related to trade flows?" The specific channels through which aid for trade facilitation might affect trade ranges from projects which seek to support regulatory reform, faster customs clearance, or improved telecommunications networks, for example. Our results suggest that aid directed toward trade facilitation has a small, but significant relationship to greater trade flows. The relationship appears to be stronger for imports overall; although when aid is targeted toward trade policy and regulations, the relationship to exports appears more robust and of larger magnitude.

Our results measure the average effect of A4TF on trade over the time period of 16 years. If we assume that the same estimated coefficients apply to aid and trade in the year 2007, we can simulate the potential impact on trade of a 1 % increase in A4TF (in USD terms). Using the trade flows and flow of aid for trade facilitation for the year 2007 and applying them to our main estimation results, we obtain the simulation results shown in Table 5a. This exercise also allows us to calculate the effectiveness of a 1 USD increase in boosting trade. Table 5b shows the simulated change in trade flows from a 1 USD increase in A4TF by different aid categories.

Table 5a: *Change in trade (million US Dollars) associated with 1 % increase in A4TF (by type of aid, trade flows 2007)*

	1	2	3	4	5	6	7
Aid Category	Baseline – all positive trade	Baseline with per capita GDP	Only countries receiving A4TF /1/	Recipients only; trade with recipients & ROW	Recipients with developing world only	Recipients with developing & bilateral donor; no intra-donor trade	Base-line (2) with lags
Narrow	818.01	818.01	-	964.11	-	655.28	-
Broad	999.79	999.79	-	912.52	364.03	810.44	908.90
Soft	363.56	363.56	952.41	1285.48	-202.97	-	2181.36
Hard	363.56	-	-	803.43	-	-	1545.13
All A4TF	545.34	454.45	666.94	583.98	85.18	368.46	-

Table 5b: *Change in trade (in US Dollars) associated with 1 US Dollar increase in A4TF (by type of aid, trade flows 2007)*

	1	2	3	4	5	6	7
Aid Category	Baseline – all positive trade	Baseline with per capita GDP	Only countries receiving A4TF /1/	Recipients only; trade with recipients & ROW	Recipients with developing world only	Recipients with developing & bilateral donor; no intra-donor trade	Base-line (2) with lags
Narrow	696.64	696.64	-	821.06	-	558.06	-
Broad	9.66	9.66	-	8.82	3.52	7.83	8.78
Soft	7.88	7.88	20.63	27.85	-4.40	-	47.25
Hard	6.21	-	-	13.73	-	-	26.41
All A4TF	5.21	4.34	6.37	5.58	0.81	3.52	-

The key results of Table 5 can be summarized as follows:

- In 2007, aid for trade facilitation amounted to about US$ 10.5 billion. If this level of aid flow increased by 1% (US$ 105 million), the increase in global trade could be about US$ 545 million (see column 1, Table 5a). This yields a 'rate of return' on each 1US$ aid extension of US$ 5 (US$ 545 million divided by US$ 105 million) (see column 1, Table 5b).

- Considering the much narrower definition of aid for trade facilitation, that is considering only the extensions of aid to *trade policy reform and regulatory reform*, based on aid from 2007 data of US$ 117 million, a 1% increase in aid (US$ 11.7 million) could generate a trade increase of about US$ 818 million (see column 1, Table 5a). This yields a 'rate of return' on every additional dollar of aid of about US$ 697 (see column 1, Table 5b).

Within the context of the global financial crisis, these findings are particularly noteworthy. They suggest that economic growth could be effectively stimulated through a targeted aid-for-trade agenda that emphasizes trade facilitating investments with the highest returns – specifically those reforms associated with trade policy and regulation. Furthermore, ongoing dialogue to address coordination and monitoring of trade-related aid might consider our results, in regard to strengthening aid effectiveness.

VI. References

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VII. Appendix

ANNEX 1: BROAD TRADE FACILITATION

INFRASTRUCTURE

Class	Aid Category		Description	Soft/Hard
Infrastructure	**210**		**TRANSPORT AND STORAGE**	
		21010	Transport policy and administrative management	**s**
		21020	Road transport	**h**
		21030	Rail transport	**h**
		21040	Water transport	**h**
		21050	Air transport	**h**
		21061	Storage	**h**
		21081	Education and training in transport and storage	**s**
	220		**COMMUNICATIONS**	
		22010	Communications policy and administrative management	**s**
		22020	Telecommunications	**h**
		22030	Radio/television/print media	**h**
		22040	Information and communication technology (ICT)	**h**
	230		**ENERGY GENERATION AND SUPPLY**	
		23010	Energy policy and administrative management	**s**
		23020	Power generation/non-renewable sources	**h**
		23030	Power generation/renewable sources	**h**
		23040	Electrical transmission/ distribution	**h**
		23050	Gas distribution	**h**
		23061	Oil-fired power plants	**h**
		23062	Gas-fired power plants	**h**
		23063	Coal-fired power plants	**h**
		23064	Nuclear power plants	**h**
		23065	Hydro-electric power plants	**h**
		23066	Geothermal energy	**h**
		23067	Solar energy	**h**
		23068	Wind power	**h**
		23069	Ocean power	**h**
		23070	Biomass	**h**
		23081	Energy education/training	**s**
		23082	Energy research	**s**

TRADE DEVELOPMENT

Class	Aid Category	Description	Soft/Hard
Trade development	**240**	**BANKING AND FINANCIAL SERVICES**	
	24010	Financial policy and administrative management	s
	24020	Monetary institutions	s
	24030	Formal sector financial intermediaries	s
	24040	Informal/semi-formal financial intermediaries	s
	24081	Education/training in banking and financial services	s
	250	**BUSINESS AND OTHER SERVICES**	
	25010	Business support services and institutions	s
	311	**AGRICULTURE**	
	31110	Agricultural policy and administrative management	s
	31120	Agricultural development	s
	31130	Agricultural land resources	h
	31140	Agricultural water resources	h
	31150	Agricultural inputs	h
	31161	Food crop production	h
	31162	Industrial crops/export crops	h
	31163	Livestock	h
	31164	Agrarian reform	h
	31165	Agricultural alternative development	h
	31166	Agricultural extension	h
	31181	Agricultural education/training	s
	31182	Agricultural research	s
	31191	Agricultural services	s
	31192	Plant and post-harvest protection and pest control	h
	31193	Agricultural financial services	s
	31194	Agricultural co-operatives	s
	31195	Livestock/veterinary services	s
	312	**FORESTRY**	
	31210	Forestry policy and administrative management	s
	31220	Forestry development	h
	31261	Fuelwood/charcoal	h
	31281	Forestry education/training	s
	31282	Forestry research	s
	321	**INDUSTRY**	
	32110	Industrial policy and administrative management	s
	32120	Industrial development	h
	32130	SME development	s
	32140	Cottage industries and handicraft	h
	32161	Agro-industries	h
	32162	Forest industries	h
	32163	Textiles, leather and substitutes	h
	32164	Chemicals	h
	32165	Fertilizer plants	h
	32166	Cement/lime/plaster	h
	32167	Energy manufacturing	h
	32168	Pharmaceutical production	h

	32169	Basic metal industries	h
	32170	Non-ferrous metal industries	h
	32171	Engineering	h
	32172	Transport equipment industry	h
	32182	Technological research and development	s
322		**MINERAL RESOURCES AND MINING**	
	32210	Mineral/mining policy and administrative management	s
	32220	Mineral prospection and exploration	h
	32261	Coal	h
	32262	Oil and gas	h
	32263	Ferrous metals	h
	32264	Nonferrous metals	h
	32265	Precious metals/materials	h
	32266	Industrial minerals	h
332		**TOURISM**	
	33210	Tourism policy and administrative management	s

ANNEX 2: NARROW TRADE FACILITATION

TRADE POLICY AND REGULATON

Class	Aid Category	Description	Soft/Hard
Trade policy and regulation	331	**TRADE POLICY AND REGULATIONS**	
		33110 Trade policy and administrative management	**S**
		33111 - Trade mainstreaming in PRSPs/development plans	**S**
		33112 - Technical barriers to trade (TBT)	**S**
		33113 - Sanitary and phytosanitary measures (SPS)	**S**
		33120 Trade facilitation	**S**
		33121 - Trade facilitation procedures	**S**
		33122 - Customs valuation	**S**
		33123 - Tariff reforms	**S**
		33130 Regional trade agreements (RTAs)	**S**
		33140 Multilateral trade negotiations	**S**
		33141 - Accession	**S**
		33142 - Dispute settlement	**S**
		33143 - Trade-related intellectual property rights (TRIPS)	**S**
		33144 - Agriculture	**S**
		33145 - Services	**S**
		33146 - Tariff negotiations - non-agricultural market access	**S**
		33147 - Rules	**S**
		33148 - Training in trade negotiation techniques	**S**
		33151 - Trade and environment	**S**
		33152 - Trade and competition	**S**
		33153 - Trade and investment	**S**
		33154 - Transparency and government procurement	**S**
		33181 Trade education/training	**S**

ANNEX 3: AID FOR TRADE FACILITATION FLOWS (disbursed in 2007)

Aid Categories	USD Millions	Aid Definition	USD Millions	Aid Definition	USD Millions
Infrastructure	5241	Broad	10349	Hard	5850
Trade development	5108	Narrow	117	Soft	4616
Trade policy and regulation	117				
Total	10466		10466		10466

ANNEX 4: REGRESSION TABLES

Table 1: Aid for Trade Facilitation Narrow Definition: Bilateral-5Year Fixed Effects and Year Fixed Effects Included

	1	2	3	4	5	6	7
	Baseline – all positive trade	Baseline with per capita GDP	Only countries receiving AfTF /1/	Recipients only; trade with recipients & ROW	Recipients with developing world only	Recipients with developing & bilateral donor; no intra-donor trade	Base-line (2) with lags
ln_tariff	-0.199***	-0.199***	-0.228**	-0.215***	-0.214***	-0.200***	-0.214***
	[0.035]	[0.035]	[0.104]	[0.048]	[0.043]	[0.036]	[0.075]
ln_rep_gdp	0.710***	1.557***	-4.740***	0.62	1.405***	1.504***	3.828***
	[0.045]	[0.324]	[1.294]	[0.484]	[0.465]	[0.328]	[1.024]
ln_part_gdp	0.257***	-0.710***	-7.441***	-2.380***	-1.570***	-0.765***	-0.069
	[0.036]	[0.271]	[1.732]	[0.495]	[0.408]	[0.275]	[0.614]
ln_itfa	0.005***	0.004**	-0.005	0.007**	0.003	0.004**	0.001
	[0.002]	[0.002]	[0.011]	[0.003]	[0.002]	[0.002]	[0.004]
ln_etfa	0.004***	0.005***	0.011	0.011***	0.002	0.005***	0.004
	[0.001]	[0.001]	[0.011]	[0.003]	[0.002]	[0.001]	[0.002]
ln_rep_gdp_cap		-0.849***	5.402***	0.062	-0.598	-0.795**	-3.438***
		[0.321]	[1.279]	[0.476]	[0.451]	[0.325]	[1.034]
ln_part_gdp_cap		0.972***	7.767***	2.621***	1.705***	1.025***	0.359
		[0.265]	[1.718]	[0.483]	[0.397]	[0.269]	[0.602]
L.ln_itfa							0.005
							[0.006]
L2.ln_itfa							0.004
							[0.005]
L.ln_etfa							0.006**
							[0.002]
L2.ln_etfa							0.001
							[0.002]
Observations	108304	107806	12424	52181	57861	104637	32592
Number of Bilat - 5year F.E.	39309	39125	6576	22181	25237	38386	13461

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

/1/ A4TF "Aid for Trade Facilitation'

Includes Bilateral- 5 year fixed effects and year fixed effects

Table 2: Aid for Trade Facilitation Broad Definition: Bilateral-5Year Fixed Effects and Year Fixed Effects Included

	1	2	3	4	5	6	7
	Baseline – all positive trade	Baseline with per capita GDP	Only countries receiving AfTF /1/	Recipients only; trade with recipients & ROW	Recipients with developing world only	Recipients with developing & bilateral donor; no intra-donor trade	Base-line (2) with lags
ln_tariff	-0.201***	-0.202***	-0.421***	-0.225***	-0.219***	-0.203***	-0.321***
	[0.035]	[0.035]	[0.067]	[0.039]	[0.043]	[0.036]	[0.073]
ln_rep_gdp	0.692***	1.604***	-1.416*	1.525***	1.595***	1.540***	3.075***
	[0.045]	[0.322]	[0.856]	[0.367]	[0.468]	[0.327]	[1.011]
ln_part_gdp	0.253***	-0.688**	-4.187***	-1.509***	-1.558***	-0.748***	-0.032
	[0.036]	[0.270]	[0.924]	[0.338]	[0.416]	[0.274]	[0.612]
ln_itfa	0.011***	0.011***	-0.023	0.017***	0.013***	0.011***	0.010*
	[0.003]	[0.003]	[0.015]	[0.004]	[0.003]	[0.003]	[0.005]
ln_etfa	-0.001	-0.001	0.021	-0.001	-0.005*	-0.001	0.002
	[0.002]	[0.002]	[0.016]	[0.003]	[0.003]	[0.002]	[0.003]
ln_rep_gdp_cap		-0.908***	2.310***	-0.828**	-0.788*	-0.843***	-2.711***
		[0.319]	[0.852]	[0.364]	[0.454]	[0.323]	[1.015]
ln_part_gdp_cap		0.944***	4.149***	1.691***	1.695***	1.003***	0.333
		[0.264]	[0.913]	[0.331]	[0.404]	[0.267]	[0.600]
L.ln_itfa							0.059***
							[0.009]
L2.ln_itfa							0.004
							[0.006]
L.ln_etfa							0.003
							[0.003]
L2.ln_etfa							-0.001
							[0.003]
Observations	108304	107806	29421	86913	57822	104639	32592
Number of Bilat - 5year F.E.	39309	39125	13284	32882	25231	38388	13461

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

/1/ A4TF "Aid for Trade Facilitation'

Includes Bilateral- 5 year fixed effects and year fixed effects

Table 3: Soft Aid for Trade Facilitation : Bilateral-5Year Fixed Effects and Year Fixed Effects Included

	1	2	3	4	5	6	7
	Baseline – all positive trade	Baseline with per capita GDP	Only countries receiving AfTF /1/	Recipients only; trade with recipients & ROW	Recipients with developing world only	Recipients with developing & bilateral donor; no intra-donor trade	Base-line (2) with lags
ln_tariff	-0.199***	-0.199***	-0.245**	-0.221***	-0.214***	-0.201***	-0.289***
	[0.035]	[0.035]	[0.104]	[0.048]	[0.043]	[0.036]	[0.072]
ln_rep_gdp	0.688***	1.574***	-4.733***	0.617	1.393***	1.508***	2.079**
	[0.045]	[0.323]	[1.290]	[0.483]	[0.466]	[0.327]	[1.038]
ln_part_gdp	0.254***	-0.697***	-7.587***	-2.338***	-1.584***	-0.759***	-0.011
	[0.036]	[0.270]	[1.742]	[0.494]	[0.407]	[0.274]	[0.610]
ln_soft_rep	0.004*	0.004*	0.068**	0.024***	0.004	0.004	0.024***
	[0.002]	[0.002]	[0.031]	[0.005]	[0.003]	[0.002]	[0.007]
ln_soft_part	-0.002	-0.002	0.057*	-0.009	-0.007**	-0.002	0
	[0.002]	[0.002]	[0.030]	[0.006]	[0.003]	[0.002]	[0.003]
ln_rep_gdp_cap		-0.882***	5.352***	0.041	-0.6	-0.814**	-1.596
		[0.320]	[1.274]	[0.474]	[0.451]	[0.324]	[1.046]
ln_part_gdp_cap		0.955***	7.919***	2.576***	1.720***	1.015***	0.312
		[0.264]	[1.726]	[0.482]	[0.396]	[0.267]	[0.599]
L.ln_soft_rep							0.046***
							[0.008]
L2.ln_soft_rep							0.020***
							[0.005]
L.ln_soft_part							0.002
							[0.003]
L2.ln_soft_part							0.004
							[0.003]
Observations	108304	107806	12424	52181	57861	104637	32592
Number of Bilat - 5year F.E.	39309	39125	6576	22181	25237	38386	13461

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

/1/ A4TF "Aid for Trade Facilitation'

Includes Bilateral- 5 year fixed effects and year fixed effects

Table 4: Hard Aid for Trade Facilitation : Bilateral-5Year Fixed Effects and Year Fixed Effects Included

	1	2	3	4	5	6	7
	Baseline – all positive trade	Baseline with per capita GDP	Only countries receiving AfTF /1/	Recipients only; trade with recipients & ROW	Recipients with developing world only	Recipients with developing & bilateral donor; no intra-donor trade	Base-line (2) with lags
ln_tariff	-0.200***	-0.201***	-0.233**	-0.218***	-0.214***	-0.202***	-0.319***
	[0.035]	[0.035]	[0.104]	[0.048]	[0.043]	[0.036]	[0.073]
ln_rep_gdp	0.686***	1.599***	-4.770***	0.757	1.394***	1.534***	3.274***
	[0.045]	[0.322]	[1.292]	[0.482]	[0.466]	[0.327]	[1.008]
ln_part_gdp	0.253***	-0.689**	-7.763***	-2.345***	-1.569***	-0.750***	-0.092
	[0.036]	[0.270]	[1.744]	[0.495]	[0.407]	[0.274]	[0.612]
ln_hard_rep	0.004*	0.004	-0.012	0.015***	0.005	0.004	0.017**
	[0.003]	[0.003]	[0.024]	[0.005]	[0.003]	[0.003]	[0.008]
ln_hard_part	0.002	0.002	0.047**	0.001	0	0.001	-0.001
	[0.002]	[0.002]	[0.023]	[0.006]	[0.003]	[0.002]	[0.004]
ln_rep_gdp_cap		-0.909***	5.422***	-0.092	-0.6	-0.843***	-2.915***
		[0.320]	[1.277]	[0.473]	[0.452]	[0.324]	[1.012]
ln_part_gdp_cap		0.945***	8.092***	2.581***	1.702***	1.004***	0.386
		[0.264]	[1.727]	[0.483]	[0.396]	[0.267]	[0.600]
L.ln_hard_rep							0.058***
							[0.009]
L2.ln_hard_rep							0.003
							[0.006]
L.ln_hard_part							-0.005
							[0.004]
L2.ln_hard_part							0.006*
							[0.004]
Observations	108304	107806	12424	52181	57861	104637	32592
Number of Bilat - 5year F.E.	39309	39125	6576	22181	25237	38386	13461

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

/1/ A4TF "Aid for Trade Facilitation'

Includes Bilateral- 5 year fixed effects and year fixed effects