



Aid for trade facilitation in lower-income countries

The role of institutional quality

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Key messages

- This study used a sample of 58 low-income and lower-middle-income countries over the period 1996-2011 to examine the impact of aid for trade facilitation on export performance.
- Country case studies suggest that the quality of local institutions determine the impact of Aid for Trade; this study is the first to examine this empirically in a panel of countries.
- The results point to a strong relationship between exports and institutional quality, as well as to a significant impact of aid for trade facilitation on export flows. Importantly, the positive and significant effect of aid for trade facilitation on export flows is found to be affected strongly by the quality of institutions in recipient countries.
- On average, good-quality institutions are found to be associated with as much as a 22% increase in export flows. Aid for trade facilitation is found to be associated with a 0.02% increase in export flows. This has implications for the wider literature on how resource flows (e.g. Aid for Trade) and policies and institutions interact to achieve better development outcomes.
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I. Introduction

Trade-related development assistance (or Aid for Trade, AfT) is recognised as an important development tool that facilitates the integration of developing countries into the global economy through initiatives that expand trade. In the economic literature, however, there are very few studies providing an empirical assessment of the impacts of AfT in recipient countries (see Basnett et al., 2012 for an extensive review of the literature). As a consequence, several issues related to the effectiveness of AfT have still not been adequately investigated or are even unexplored.

Most studies focus on the effectiveness of AfT at an aggregated level, and evidence on the impact of specific AfT interventions or instruments is limited (see, e.g., Busse et al., 2011; Cali and te Velde, 2011; Gourdon et al., 2011; Volpe Martincus, 2011, among others). Differences in AfT effectiveness by productive sector have also been taken into account only to a limited extent (Brenton and von Uexkull, 2009; Cali and te Velde, 2011; Ferro et al., 2011; Ivanic et al., 2006; Portugal-Perez and Wilson, 2010). Moreover, to our knowledge, there has so far been no assessment of the impact of different levels of institutional quality of recipient countries on the effectiveness of AfT.

This study aims to overcome some of the above issues by investigating the impact of AfT for trade facilitation (henceforth aid for trade facilitation) on export performance in a sample of 58 low-income and lower-middle-income countries over the period 1996-2011, and by assessing the extent to which recipient countries' institutional quality may affect the effectiveness of aid for trade facilitation. Therefore, the study contributes to the literature on the effectiveness of AfT in three ways. First, it provides additional evidence on the effectiveness of one specific item of AfT, that is, aid for trade facilitation. Second, it adds to existing studies by looking specifically at a sample of lower-income countries over a longer time period. Third, and most importantly, it analyses for the first time the impact of the quality of institutions in recipient countries on the effectiveness of aid for trade facilitation.

The paper is structured as follows. Section II presents the methodology and data used to conduct the panel regressions for total exports. Section III presents the main results. Particular attention is devoted to the role recipient country institutional quality plays in enhancing the effectiveness of aid for trade facilitation. Section IV offers some conclusions and policy recommendations.

II. Methodology and data

This study uses panel data techniques. In particular, in order to take into account joint endogeneity issues and country-specific effects, it uses the Generalized Method of Moments (GMM) estimator introduced by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1997). The GMM has the advantage of making it possible to join in a single system the regression equations in differences and levels, each one with its set of instrumental variables (usually lags of each variable are used as instruments), thus allowing us to deal with the potential endogeneity of explanatory variables.¹

The specification employed to study the relationship between aid for trade facilitation and exports, as well as the role of recipient countries' institutional quality in enhancing the effectiveness of aid for trade facilitation, is the following:

$$\mathbf{Exports}_{it} = \alpha \mathbf{Exports}_{(it-1)} + \beta \mathbf{AfT}_{it} + \gamma \mathbf{A}_{TFit} + \delta \mathbf{Institutions}_{it} + \varphi (\mathbf{A}_{TF} * \mathbf{Institutions})_{it} + \vartheta \mathbf{X}_{it} + \mathbf{u}_i + \varepsilon_{it} \quad (1)$$

where the dependent variable $\mathbf{Exports}_{it}$ corresponds to total exports for country i at time t . The main explanatory variables of interest are aid for trade facilitation (\mathbf{A}_{TF}) and the interaction term between \mathbf{A}_{TF} and the quality of institutions ($\mathbf{A}_{TF} * \mathbf{Institutions}$). The other explanatory variables are a matrix \mathbf{AfT}_{it} , which includes three categories of AfT (i.e. aid directed to trade policy and regulation, aid directed to economic infrastructure and aid directed to productive capacity building), the quality of institutions ($\mathbf{Institutions}_{it}$) and a matrix \mathbf{X}_{it} of control variables such as population (population), the consumer price index (CPI) and the exchange rate (XR), which are used, respectively, as proxies for market size, the relative level of prices and macroeconomic stability.² All variables are in log levels.

We first difference Equation 1 to remove country-specific effects, and obtain:

$$\Delta \mathbf{Exports}_{it} = \alpha \Delta \mathbf{Exports}_{(it-1)} + \beta \Delta \mathbf{AfT}_{it} + \gamma \Delta \mathbf{A}_{TFit} + \delta \Delta \mathbf{Institutions}_{it} + \varphi \Delta (\mathbf{A}_{TF} * \mathbf{Institutions})_{it} + \vartheta \Delta \mathbf{X}_{it} + \Delta \rho_{it} \quad (2)$$

where $\Delta \rho_{it} = \Delta \mathbf{u}_i + \Delta \varepsilon_{it} = (\mathbf{u}_i - \mathbf{u}_i) + (\varepsilon_{it} - \varepsilon_{(it-1)}) = \varepsilon_{it} - \varepsilon_{(it-1)} = \Delta \varepsilon_{it}$. Assuming that ε_{it} is *iid* over i and t , $\Delta \mathbf{Exports}_{(it-2)}$ could be a valid instrument for $\Delta \mathbf{Exports}_{(it-1)}$, and so the GMM uses the following moment conditions:

$$\mathbf{E}[\mathbf{Exports}_{it-s}(\varepsilon_{it} - \varepsilon_{it-1})] = \mathbf{0} \quad \text{for } s \geq 2 \text{ and } t = 3, \dots, T \quad (3)$$

$$\mathbf{E}[\mathbf{X}_{it-s}(\varepsilon_{it} - \varepsilon_{it-1})] = \mathbf{0} \quad \text{for } s \geq 2 \text{ and } t = 3, \dots, T \quad (4)$$

The data used in our panel regressions are retrieved from different sources. Exports data as well as data on the CPI, XR and population are sourced from the World Bank's World Development Indicators (WDI). Data related to the AfT variables (i.e. AfT disbursements directed to trade policy and regulations (\mathbf{AfT}_{policy}), economic infrastructure (\mathbf{AfT}_{infra}) and productive capacity building (\mathbf{AfT}_{produ}) as well as aid for trade facilitation (\mathbf{A}_{TF}) disbursements are collected from the

¹ Exports, aid for trade facilitation and institutions might be endogenous, since reverse causality could arise between these variables.

² XR refers to the official exchange rate (local currency unit per \$, period average).

Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System (CRS) database. It is worth highlighting that aid for trade facilitation is a multidimensional variable since it refers not only to the simplification and standardisation of customs formalities and administrative procedures related to international trade, but also to the business environment, quality of infrastructure, transparency and domestic regulations. In this study, we identify aid for trade facilitation with the correspondent item within the aid to trade policy and regulation category of the OECD CRS database. Therefore, in order to avoid double counting, in the regressions, the aid for trade facilitation component (A_{TF}) has been detracted from the AfT directed to trade policy and regulations variable (AfT_policy).

Data on institutional quality stem from the Heritage Foundation's Index of Economic Freedom, which we use as a proxy for the quality of institutions. This index aggregates 10 components with equal weight: business freedom; trade freedom; fiscal freedom; government spending; monetary freedom; investment freedom; financial freedom; property rights; freedom from corruption; and labour freedom. The index assigns a score (0-100) to each country's performance and higher scores correspond to higher levels of institutional quality. The index has several advantages compared with other governance indicators. First, it covers almost all the low-income and lower-middle-income countries with a sufficient time span and at annual frequency. Second, it seeks to provide a quite broad assessment of institutional quality and is not time invariant. Finally, it has been used repeatedly in the recent literature as a proxy for institutional quality.³

Table 1 reports some descriptive statistics for selected variables over the sample period 1996-2011. Note that the sample period was constrained by the AfT data availability for the countries of interest. In total, the sample contains 799 observations, with the sole exception of CPI, which has only 771 observations.

Table 1: Descriptive statistics for regression variables, 1996-2011

| Variable | Obs | Mean | Std. dev. | Min | Max |
|-----------------|-----|-------|-----------|-------|-------|
| Exports 1/ | 799 | 21.46 | 1.63 | 18.13 | 26.28 |
| Institutions 2/ | 799 | 3.99 | 0.14 | 3.45 | 4.33 |
| AfT_infra 3/ | 799 | 15.92 | 5.03 | 0 | 21.12 |
| AfT_produ 4/ | 799 | 15.92 | 4.77 | 0 | 20.64 |
| AfT_policy 5/ | 799 | 3.94 | 6.32 | 0 | 18.94 |
| A_{TF} 6/ | 799 | 3.59 | 5.58 | 0 | 16.85 |
| CPI 7/ | 771 | 4.44 | 0.80 | -2.60 | 7.09 |
| Population 8/ | 799 | 16.30 | 1.57 | 12.04 | 20.94 |
| XR 9/ | 799 | 4.54 | 2.55 | -4.60 | 9.93 |

Notes: All variables are in natural logs. 1/ Total exports in constant \$; 2/ Index of Economic Freedom; 3/ total AfT disbursements directed to economic infrastructure in constant \$; 4/ total AfT disbursements directed to productive capacity building in constant \$; 5/ total AfT disbursements directed to trade policy and regulations in constant \$ minus aid for trade facilitation disbursements in constant \$; 6/ aid for trade facilitation disbursements in constant \$; 7/ consumer price index; 8/ population in millions; 9/ nominal exchange rate.

Sources: World Bank's WDI, OECD CRS database, Heritage Foundation.

³ See, for example, Billmeier and Massa (2009), Boatman (2007), Brambila-Macias and Massa (2011), Brambila-Macias et al. (2011), Creane et al. (2004), Lejour et al. (2006), Sahay and Goyal (2006), among others.

In the correlation matrix reported in Table 2, we can see that all AfT variables (AfT_infra, AfT_produ, AfT_policy) are positively correlated with Exports. Note that exports have the highest correlation with AfT directed to trade policy and regulations (AfT_policy) and AfT directed to economic infrastructure (AfT_infra). This is in line with theory expectations, since a number of previous empirical studies have found that AfT_policy and AfT_infra have a particularly high impact on recipient countries' exports (Cali and te Velde, 2011; Helble et al., 2009; Vijil and Wagner, 2010). Aid for trade facilitation (A_{TF}) has also a positive correlation with exports in line with theory expectations (Helble et al., 2009). On the other hand, institutional quality (Institutions) seems to be weakly but negatively correlated with exports. The same applies to exchange rates (XR). This is surprising, although the real effect of these variables on export flows may be assessed only through adequate regression analysis. Finally, population and CPI are positively correlated with total exports, with population having the highest correlation among all the considered variables.

Table 2: Correlation matrix

| | <i>Exports</i> | <i>Institutions</i> | <i>AfT_infra</i> | <i>AfT_produ</i> | <i>AfT_policy</i> | <i>A_{TF}</i> | <i>CPI</i> | <i>Population</i> | <i>XR</i> |
|--------------------------|----------------|---------------------|------------------|------------------|-------------------|-----------------------|------------|-------------------|-----------|
| <i>Exports 1/</i> | 1 | | | | | | | | |
| <i>Institutions 2/</i> | -0.04 | 1 | | | | | | | |
| <i>AfT_infra 3/</i> | 0.26 | 0.18 | 1 | | | | | | |
| <i>AfT_produ 4/</i> | 0.20 | 0.18 | 0.88 | 1 | | | | | |
| <i>AfT_policy 5/</i> | 0.36 | 0.11 | 0.30 | 0.3 | 1 | | | | |
| <i>A_{TF} 6/</i> | 0.31 | 0.11 | 0.27 | 0.3 | 0.94 | 1 | | | |
| <i>CPI 7/</i> | 0.07 | 0.20 | 0.14 | 0.2 | 0.28 | 0.26 | 1 | | |
| <i>Population 8/</i> | 0.77 | -0.23 | 0.38 | 0.3 | 0.29 | 0.24 | 0.03 | 1 | |
| <i>XR 9/</i> | -0.01 | 0.07 | 0.28 | 0.3 | 0.10 | 0.10 | 0.32 | 0.16 | 1 |

Notes: All variables are in natural logs. 1/ Total exports in constant \$; 2/ Index of Economic Freedom; 3/ total AfT disbursements directed to economic infrastructure in constant \$; 4/ total AfT disbursements directed to productive capacity building in constant \$; 5/ total AfT disbursements directed to trade policy and regulations in constant \$ minus aid for trade facilitation disbursements in constant \$; 6/ aid for trade facilitation disbursements in constant \$; 7/ consumer price index; 8/ population in millions; 9/ nominal exchange rate. *Sources:* World Bank's WDI, OECD CRS database, Heritage Foundation.

III. Results and interpretations

Table 3 presents the results of our panel regressions. Columns (1) through (6) show the coefficients associated to different specifications of our dynamic panel GMM model. It is important to highlight that all AfT variables (including aid for trade facilitation) were lagged two years in order to take into account the time needed for AfT disbursements to have an impact on export flows. This is in line with previous empirical studies in the literature (see, e.g., Calì and te Velde, 2011). The institutional quality variable was also lagged two years since it takes time for improved institutions to have an impact on a country's export performance.

It is noted that the lagged dependent variable ($Exports_{(t-1)}$) is significant and positive throughout all the specifications, thus suggesting that, the more a country exports, the higher the chances it will maintain or increase its export flows in the near future. This is in line with expectations given the setup dynamic model.

The proxy for institutional quality (*Institutions*) is also highly significant and consistently positive throughout all regressions (columns (1) to (6)), which is in line with expectations and previous findings in the literature (see Iwanow and Kirkpatrick, 2007; Jansen and Nordås, 2004; Levchenko, 2007, among others).

Indeed, adequate and efficient institutions tend to facilitate trade. Inefficient institutions, instead, represent a cost factor for exporter countries and thus lower their international competitiveness, with negative effects on export flows. Moreover, they generate transaction costs that raise the final consumer price of imported goods, and therefore negatively affect a country's import flows. Our results show that, on average, good-quality institutions can be associated with as much as a 22% increase in export flows.

Moving to the three categories of AfT (i.e. *AfT_infra*, *AfT_produ* and *AfT_policy*), it is important to highlight that their impacts are steadily positive and significant throughout specifications (1) to (6). This is in line with the general finding in the existing empirical literature that AfT can be effective in promoting trade performance (Basnett et al., 2012). However, it is interesting to note that the magnitude of their impact on export flows is relatively small – averaging a mere 0.02%, with no particular category of AfT having a dominant effect on exports. Calì and te Velde (2011) used a similar specification and found evidence that AfT directed to economic infrastructure was the main force driving the overall effects of AfT on exports. Our results confirm the importance of AfT directed to economic infrastructure, but find that AfT directed to productive capacity building and to trade policy and regulations has an equally important and significant impact on export flows.

Aid for trade facilitation (A_{TF}) is found to play a positive and significant role in enhancing export flows (columns (1) and (6)). In particular, aid for trade facilitation can be associated with a 0.02% increase in export flows. However, once the interaction term for aid for trade facilitation and institutional quality ($A_{TF} * Institutions$) is included, the significance of the A_{TF} variable is eroded (columns (3) to (5)). The coefficient of the interaction term, instead, remains positive and significant throughout all specifications, with an average magnitude of 0.003. This suggests the importance of recipient countries' institutional quality in enhancing the effectiveness of aid for trade facilitation disbursements. In other words, aid for trade facilitation on its own is important for fostering export flows, but it is its combination with good-quality institutions in recipient countries that allows aid for trade facilitation disbursements to unfold their positive effects. Additional evidence of the importance of institutional quality in enhancing the effectiveness of aid for trade

facilitation is provided by the fact that, in columns (3) to (5), the coefficients for institutional quality remain stable and significant after the introduction of the interaction term.

This finding is particularly relevant, and adds to the existing quantitative evidence on the effectiveness of aid for trade facilitation in fostering trade performance (Busse et al., 2011; Cali and te Velde, 2011; Helble et al., 2009; Ivanic et al., 2006). Our results, indeed, suggest that the potential positive effects of aid for trade facilitation may be weakened in the absence of adequate and efficient institutions.

Regarding the other control variables, we found that *population* exerts a positive and significant effect on export flows ranging from 9% to 11% across all specifications, while exchange rate depreciation is associated with an average 2% increase in export flows from lower-income countries (column (3)). *CPI* has an ambiguous impact: in column (2) it is negative and highly significant, whereas in column (5) its effect on exports appears to be positive, albeit weakly significant. *CPI* effects in columns (1) and (6) are non-significant.

IV. Conclusions and policy implications

Although there is a growing literature on aid for trade facilitation, to our knowledge there are no studies assessing the impact that recipient countries' institutional quality may have on the effectiveness of aid for trade facilitation in promoting export flows. In this paper, we analyse the possible interactions between institutional quality and aid for trade facilitation in a sample of 58 lower-income countries over the period 1996-2011.

Our results point to a strong relationship between exports and institutional quality, as well as to a significant impact of aid for trade facilitation on export flows. Interestingly, the effect of aid for trade facilitation on export flows is found to be driven strongly by the quality of institutions in recipient countries.

This has important policy implications for both donors and recipient countries. For donors, it appears that one prerequisite for providing effective aid for trade facilitation should be to assess first the adequacy of the institutions of recipient countries. On the other hand, recipient countries' governments should work hard in improving the institutional framework of their economies in order to be able to make the most of the aid for trade facilitation flows they receive. Failing to do so may be counterproductive or reduce significantly the impact aid for trade facilitation may have on fostering export flows.

Future avenues of research may include the extension of this study to consider bilateral export flows. Moreover, it would be interesting to repeat the analysis including interaction terms between different AfT categories (AfT to economic infrastructure, AfT to productive capacity building and AfT to trade policy and regulations) and institutional quality.

Table 3. Dynamic panel (GMM) results, 1996 to 2011

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---------------------------------|----------|-----------|----------|----------|----------|----------|
| $Exports_{(t-1)}$ | 0.893*** | 0.965*** | 0.875*** | 0.875*** | 0.896*** | 0.897*** |
| $Institutions_{(t-2)}$ | 0.188*** | 0.225*** | 0.201*** | 0.199*** | 0.203*** | 0.204*** |
| $AfT_infra_{(t-2)}$ | 0.002*** | 0.002*** | 0.002*** | 0.002*** | | |
| $AfT_produ_{(t-2)}$ | 0.002*** | | 0.002*** | 0.003*** | | |
| $A_{TF(t-2)}$ | 0.002*** | | -0.003 | -0.001 | -0.001 | 0.002*** |
| CPI | 0.000 | -0.020*** | | | 0.004* | 0.003 |
| $Population$ | 0.095*** | | 0.111*** | 0.115*** | 0.091*** | 0.090*** |
| $AfT_policy_{(t-2)}$ | | 0.001*** | | | | |
| $(A_{TF}*Institutions)_{(t-2)}$ | | | 0.003** | 0.002** | 0.003*** | |
| XR | | | 0.017*** | | | |
| <i>Observations</i> | 663 | 663 | 675 | 675 | 663 | 663 |
| <i>Countries</i> | 56 | 56 | 58 | 58 | 56 | 56 |
| <i>ABTest1</i> | -4.39 | -4.39 | -4.44 | -4.44 | -4.37 | -4.38 |
| <i>ABTest2</i> | -0.95 | -0.96 | -0.98 | -0.98 | -1.03 | -1.03 |
| χ^2 | 53 | 52 | 53 | 52 | 52 | 52 |

Notes: The dependent variable is the value of total exports in constant \$ in log levels. The regressions performed correspond to the system dynamic panel data estimation. The coefficients above correspond to the system-GMM and differenced variables were used as instruments ($\Delta Exports_{i,t-1}$, ΔX_{it} , $Exports_{i,t-1}$, X_{it}). The last three lines correspond to the Arellano–Bond autocorrelation tests (AB tests, z-statistics reported. H_0 : no autocorrelation) and Sargan test for over-identification (H_0 : over-identifying restrictions are valid). *, ** and *** denote the significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations.

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Appendix

Table A1: List of countries included in the sample

| | | | | | |
|--------------------------|------------------|-------------|------------------|------------------|-------------|
| Armenia | Chad | Guinea | Madagascar | Philippines | Tanzania |
| Bangladesh | Congo, Dem. Rep. | Haiti | Mali | Rwanda | Togo |
| Belize | Congo, Rep. | Honduras | Mauritania | Samoa | Uganda |
| Benin | Côte d'Ivoire | India | Moldova | Senegal | Ukraine |
| Bolivia | Djibouti | Indonesia | Morocco | Sierra Leone | Uzbekistan |
| Burkina Faso | Egypt, Arab Rep. | Kenya | Mozambique | Sri Lanka | Vietnam |
| Cambodia | El Salvador | Kyrgyz Rep. | Nicaragua | Sudan | Yemen, Rep. |
| Cameroon | Ethiopia | Lao PDR | Pakistan | Swaziland | Zambia |
| Cape Verde | Gambia, The | Lesotho | Papua New Guinea | Syrian Arab Rep. | |
| Central African Republic | Guatemala | Liberia | Paraguay | Tajikistan | |



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