

3

The Effects of Aid for Trade – An Empirical Framework

We use two broad ways of assessing the impact of AfT: its effect on the costs of trading and on exports.

Aid for Trade and the costs of trading

First, we estimate whether particular types of AfT have affected trade costs as measured investment climate indicators at the macro level, such as the time taken by customs to clear imports and exports, and the cost of exporting and importing goods across countries and over time (conditioning on other variables). These variables measure separately the time and the costs (in US\$) of handling and transporting a 20-foot container to (or from) the port of departure (or entry). In the case of costs, these include costs for documents, administrative fees for customs clearance and technical control, terminal handling charges and fees for in-country transport. The cost measure does not include tariffs or trade taxes. Only official costs are recorded. These cost and time variables only capture the efficiency with which exports and imports are handled *within* the country of interest. For instance, in the case of exports, procedures start after the goods are packed at the factory and include all official costs until the goods' departure from the point of exit. For imports, procedures start when goods are unloaded from a vessel at the port of entry or when the vehicle carrying them has crossed the border and go on until delivery at the factory or warehouse (see Appendix 1 for a more complete description). Therefore these measures are not affected by the degree of isolation of the country (e.g. its distance from its trading partners), as the costs of transporting the goods from (or to) the point of departure (or destination) are excluded. This analysis is important, as the costs faced and the time taken by firms to trade goods are significant determinants of a country's competitiveness. Djankov et al. (2006) find that each additional day that a product is delayed prior to shipping reduces trade by at least 1 per cent.

The equation we test at the macro level is:

$$\ln(IC)_{i,(2008)}^z = \alpha + \beta_1 \ln(1 + Atpr)_{i,(2006)} + \beta_2 \ln(IC)_{i,(2007)} + \Gamma Z_i + \varepsilon_i \quad (1)$$

where IC is an investment climate indicator (country i , indicator z), $Atpr_{(2006)}$ is aid for trade policy and regulation (in thousands US\$) lagged two years, and Z is a vector of other determinants of IC . We use $\ln(1+Atpr)$ to avoid missing and negative values.⁵ Specification (1) tests whether this type of aid for trade does indeed determine significant changes in the procedural costs of and the time taken to trade across borders. This is a direct test, as a substantial part of $Atpr$ is aimed at reducing the costs of trading across borders.⁶ In particular, AfT facilitation is one of the parts of $Atpr$ specifically targeting the reduction of these types of costs.

According to the data description by WTO/OECD:

... trade facilitation relates to a wide range of activities such as import and export procedures (e.g. customs or licensing procedures); transport formalities; and payments, insurance, and other financial requirements [...] Cutting red tape at the point where goods enter a country and providing easier access to this kind of information are two ways of 'facilitating' trade. WTO/OECD (2008)

We will also test the effects of aid for trade facilitation on IC variables.⁷ We relate the IC variable in 2008 to the aid for trade regressor in 2006, as the former is measured at the beginning of the year to which it refers.

Other investment climate indicators which may also affect trade include variables such as being landlocked, income levels, size of the country and governance indicators from Kaufmann et al. (2007). Kaufmann indicators measure perceptions of the effectiveness of government. Income levels are important because higher levels are associated with better institutions and rules. The size and geographical status of countries clearly affect trade costs.

Aid for Trade and exports

Secondly, we will estimate the effects of AfT on exports directly, using an augmented export demand equation which includes AfT. We need to justify adding (aid to) infrastructure and productive capacities to an export demand equation. Better infrastructure and capabilities should improve productivity and hence prices, which would be reflected in the standard specification. But as this normally measures relative prices by the real effective exchange rate based on the consumer price index, and the demand for exports depends on trade prices (production prices in the source country plus the costs of transporting the product to the other country), a reduced form equation includes aid to infrastructure and productive capacities because these types of aid affect the costs of trading via infrastructure and developing trade.

For example, better infrastructure, better marketing links or improved standards should make it easier to trade, but they tend to be excluded from traditional export and import demand equations:

$$\ln(E)_{it} = \alpha_i + \gamma_1 \ln(1 + Apc)_{it-1} + \gamma_2(1 + Ai)_{it-1} + KEZ_{it} + \lambda_t + \varepsilon_{it} \quad (2)$$

Where E is the volume of exports (country i , time t), Apc is aid for productive capacity and Ai is aid for economic infrastructure, α_i country effects, λ_t estimation period effects and Z a vector of controls, including relative prices and a measure of international demand.

Specification (1) has a number of potential problems that may bias the results, including omitted variable bias, owing to unobserved cross-country heterogeneity, and potential endogeneity of the AfT variable (e.g. if better reforming countries tend to receive more aid). Specification (2) is less subject to omitted variable bias than (1), as

it controls for time invariant country characteristics (such as geography, location, and history). However, this specification still suffers to some extent from omitted variable bias of cross-country regressions due to time varying differences across countries.

To overcome these problems, we use a strategy based on inter-sectoral and intra-sectoral (over time) differences in exports. We divide aid to productive capacities into aid to the different sectors and then relate sectoral aid to sector-specific exports. This helps to identify whether sectors in the same country that receive more aid experience relatively faster growth in their exports (between group component), as well as whether exports of a sector grow faster in years in which that sector receives relatively higher levels of aid (within group component). The main advantage of this strategy is that it allows us to control for all time varying within country factors that may influence exports, such as effective demand, policies, size of the economy, economic fundamentals, country-level shocks, etc. Because of this, we can also use value of exports as the dependent variable instead of real exports (as in the specification (2)), which allows us to have more observations. We use four large sectors of the economy for which export data (from the World Development Indicators) are available: food production, manufacturing, mineral extraction and tourism. These account for all exports of goods and part of services exports of the countries in the panel. We match these sectors with their counterparts in the aid data: agriculture and fishing, industry, mining and tourism.

We estimate the following equation:

$$\ln X_{ijt} = \alpha_{it} + \delta_1 \ln Apc_{ijt-1} + \delta_2 \ln (Apc_{ijt-1})^2 = \phi \Delta \ln X_{ijt-1} + \lambda_{jt} + \varepsilon_{ijt} \quad (3)$$

where X is the value of exports (for country i , sector j and time t), Apc is aid to productive capacity, α_{ij} is country-year fixed effects, λ_{jt} is time varying sector fixed effects and ΔX is the proportionate rate of growth of exports in country i and sector j in the previous period. The latter variable serves to control for the endogeneity of aid, i.e. if aid for productive capacity may also be allocated on the basis of the growth of exports.

Data

We employ data from a variety of sources. Aid data is taken from the OECD CRS database on disbursements. This database has covered a number of AfT activities since the mid-1970s; reporting to the CRS is improving and improvements are being made to the data. We use different types of AfT data from this database, including aid for trade policy and regulations, aid to productive capacity (both total and sectoral) and aid for economic infrastructure. These categories, as well as the basic structure of the database, are described in Box 3.1. We have also used the WTO/OECD (2008) database for trade facilitation data. This was a joint effort by the OECD and WTO, and covered a large number of trade-related technical assistance projects between 2001 and 2006.⁸ As the OECD CRS is likely to become the standard for aid for trade data collection, we use data from WTO/OECD only for robustness checks.

Data on investment climate indicators have become available for a large number of

Box 3.1. Aid for Trade data in the OECD CRS database

The OECD Development Co-operation Directorate bases its classification of the destinations of aid on the specific area of the social or economic structure in the receiving country that the aid transfer is intended to foster. The categories therefore refer to the overarching goal (e.g. trade facilitation), rather than the service provided through the funds (e.g. funding of regional trade agreements (RTAs) or training). The system of purpose codes summarises this classification in five digits: the first three refer to the respective DAC5 sector, and the remaining two represent numbering from more general (10–50) to more specific (60–90).

- **Ainf** *Economic Infrastructure*, coded as number 200, includes transport and storage, communications, energy, banking and financial services, and business and other services, each with its own sub-components.
- **Apc** *Production sectors*, coded as 300, includes the four sectors treated separately: agriculture-forestry-fishing, industry-mining-construction, trade policy and regulations, and tourism.
- **Atpr** *Trade Policy and Regulations*, coded as 331, is composed of trade policy and administrative management, trade facilitation, regional trade agreements, multilateral trade negotiations, trade-related adjustment and trade education/training. The same holds true for tourism, which has only one final component: tourism policy and administrative management.

The other destinations for sectoral aid for productive capacity all have multiple ramifications and are further focused. Under the category agriculture-forestry-fishing, *agriculture* (coded 311) has 18 final components, ranging from the general agricultural policy and administrative management (31110) to specific livestock/veterinary services (31195). The same applies for *fishing* (313), which incorporates five possible destinations for aid. The category industry-mining-construction has among its sub-sections *industry* (321) and *mineral resources and mining* (322), which we use for proxying aid to manufacturing and minerals sectors respectively in the analysis below.

Source: OECD CRS website; see also Turner (2008)

countries through the World Bank report, *Doing Business*. These surveys cover the number of documents, and the time and costs required to change a certain regulation (e.g. in relation to registering property or dealing with licences). We focus on indicators for trade across borders provided in *Doing Business* (see Appendix 1). For total export data, we construct real exports series using IMF (2008) data on values and unit values, and we extract sectoral export data (in current US\$) from World Bank (2008). We also use the real effective exchange rate from the IMF (2008) and the volume of world imports or GDP from World Bank (2008).