6

Empirical Analysis of the Effects of Aid for Trade on SVEs

We build on the previous study by Calì and te Velde (2008) to empirically assess the impact of AfT on SVEs and compare it with the impact on the rest of developing countries. As in the rest of this study, we adopt the Commonwealth Secretariat definition of SVEs as the main way of identifying those countries. As a robustness check we also test the findings by using the WTO definition of SVEs.

Following the theoretical framework in the previous section, we use two ways of assessing the impact: first, a relatively narrow one looking at the effects of a specific category of AfT (i.e. trade facilitation) on the costs of trading; second, a broader assessment of the effects of AfT on exports which represents an empirical implementation of equation (6).

6.1 The empirical models

Aid for trade and the costs of trading

First, we estimate whether particular types of AfT have affected trade costs, namely whether trade facilitation has had any impact on b_i, as defined in equation (7). This is measured by 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 (conditional on other variables). These variables measure separately the time and 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. 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. In any instance we use country-fixed effects in some of the specifications to account for the potential influence of any time invariant country-specific factor, such as geography and location. 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.

We employ a number of different specifications for the test at the macro level. We use both a semi-log (equation 8) and a log-log specification (equation 8'):

$$\ln(IC)_{it}^{Z} = \alpha_i + \beta Atf_{it-1} + \Gamma \mathbf{Z}_{it-1} + \gamma_t + \varepsilon_{it} \tag{8}$$

$$\ln(IC)_{it}^{Z} = \alpha_i + \phi \ln(1 + Atf)_{it-1} + \mathbf{K}\mathbf{Z}_{it-1} + \gamma_t + \mu_{it} \tag{8'}$$

where *IC* is a trade-related investment climate indicator for country *i*, such as the cost of trading, *Atf* is aid for trade facilitation (in US$ million) lagged one year, α_i is country fixed-effects, γ_t are time effects, *Z* is a vector of other determinants of *IC*, and ε and μ are the error terms.[13]

Specifications (8) and (8') test whether this type of AfT does indeed determine significant changes in the procedural costs of and the time taken to trade across borders. This is a direct test, as virtually the entire aid for trade facilitation is aimed at reducing the costs of trading across borders. According to the data description by OECD/DAC (2009), trade facilitation assistance is aimed at the 'simplification and harmonisation of international import and export procedures (e.g. customs valuation, licensing procedures, transport formalities, payments, insurance); support to customs departments; tariff reforms'.[14] We specifically test whether the effects of *Atf* are different for SVEs vis-à-vis other developing countries.

We will also test for the effects of aid for trade education/training (*Atedu*) on *IC* variables. This type of aid is directed at 'human resources development in trade, including university programmes in trade' (OECD/DAC, 2009).

Other controls which may also affect trade include variables such as being landlocked, income levels, the size of the country and governance indicators from Kaufmann *et al.* (2008). Kaufmann indicators measure perceptions of the effectiveness of government. Income levels are important because higher levels are usually 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 different types of AfT: (aid to) infrastructure and productive capacities. This test follows from the theoretical model and represents a reduced form equation of (6) and (7).

$$X_{it} = \alpha_i + \gamma_1 Apc_{it-2} + \gamma_2 Ai_{it-2} + \gamma_3 MP_{it} + \gamma_4 p_{it} + \lambda_t + \varepsilon_{it} \quad (9)$$

where X is the (log of) exports value in constant prices (country i, time t), Apc is (log of 1+) aid disbursed to productive capacity and Ai is (log of 1+) aid disbursed to economic infrastructure, MP is a market potential measure, and p is the level of prices (both in log); α_i country effects, λ_t estimation period effects. Unlike expression (8), we use two year lag for the AfT variables here, as AfT may take some time before affecting the level of exports as their impact is mediated through other variables. On the other hand the impact of Atf on trading costs is more direct and thus a year lag seems more appropriate. The results from (9) are generally robust to including one instead of two lags (results are available upon request). MP is computed as a distance weighted measure of other countries' GDP:

$$MP_{it} = \sum_{j=1}^{N} \frac{GDP_{jt}}{d_{ij}}$$

where GDP_{jt} is total GDP of country j at time t and d_{ij} is the distance in kilometres between country j and country i (measured as the great circle distance between the respective capital cities).[15]

There are still a couple of potential problems with running specification (10). First, the AfT variables are possibly endogenous to exports. This is the case for example if better performing and/or faster reforming countries tend to receive more AfT than others. This would generate an upward bias in the AfT coefficients. Also, there could be some error in the measurement of the AfT variables, as this is based on voluntary reporting of disbursements by donors to the OECD secretariat. Such error could be caused by inefficiency in reporting and/or misclassification of projects and if it is correlated to (time varying) unobserved characteristics of recipients, it could make the AfT coefficients inconsistent. In order to control for these potential issues, we use an instrument for AfT based on the degree of respect for civil liberties, as measured by Freedom House (2009). There is consistent evidence that donors tend to give relatively more aid to countries which are considered to respect civil liberties and human rights (Alesina and Dollar, 2000; Macdonald and Hoddinott, 2004 for Canada). The Millennium Challenge Corporation, one of the major providers of US AfT, explicitly uses Freedom House indicators on respect for civil liberties and for political rights as criteria for recipient countries to be eligible for assistance. Other than being a good predictor of future aid allocation, this variable (civil liberties) is also not related to exports in any meaningful way, thus satisfying the conditions of exclusion restriction. It is hard to find any clear link between a country's respect for civil liberties and its capacity to export. This is also confirmed by the insignificant coefficient of civil liberties when we include it in specification (9).[16]

Another potential issue with the estimation of (9) is its lack of dynamics property.

It is generally acknowledged (Senhadji and Montenegro, 1999; Santos-Paulino and Thirlwall, 2004) that exports are fairly persistent over time, as they tend to depend on previous exports. Thus we test our results also against a dynamic specification. We employ a first difference approach:

$$\Delta X_{it} = \gamma_1 \Delta Apc_{it-2} + \gamma_2 \Delta Ai_{it-2} + \gamma_3 \Delta MP_{it} + \gamma_4 \Delta p_{it} + \gamma_5 \Delta X_{it-1} + \lambda_t + \Delta \varepsilon_{it} \quad (10)$$

where $\Delta X_{it} = X_{it} - X_{it-1}$

By construction ΔX_{it-1} is correlated with $\Delta \varepsilon_{it-1}$ in (12) (as X_{it-1} is correlated to ε_{it-1}). Hence we resort to the Generalised Methods of Moments (GMM) estimator which generates internal instrument using appropriate lagged values of the explanatory variables (Arellano and Bond, 1991). The GMM technique serves also as a robustness test for the impact of AfT variables on exports, as it allows controlling for (weak) endogeneity of the AfT variables by using a different type of instrumental variables to that employed above. To make the analysis more robust, we also use the excluded instrument *civil liberties* in the GMM estimation of (10).

As the measurement error of the AfT variables could be determined not only by random errors but also by recipient-specific characteristics (e.g. if the disbursement process is cumbersome and thus under-reported in certain countries), we employ the GMM-system estimator rather than the GMM-difference estimator (Blundell and Bond, 1998). This estimator uses the explanatory variables in levels in the regression and instruments them through their past values of first differences. In this way it allows controlling for unobserved recipient-specific effects that are potentially correlated with the explanatory variables.

We estimate (9) and (10) separately for SVEs and non-SVEs to check whether aid to economic infrastructure (A_{INFRA}) and aid to productive capacity (*Apc*) have a differential impact on SVEs (relative to other developing countries) along the lines described in Section 4.

AfT and sectoral exports

Aid to productive capacity (*Apc*) is usually targeted at specific sectors; it is typically provided to firms or (public and private) institutions active in a particular sector. Thus the identification of its effects on total exports – as it is the case in the specifications above – may be weak. Moreover specifications (10) and (12) may still suffer to some extent from omitted variable bias of cross-country regressions due to unobservable time varying differences across countries (e.g. country-specific shocks to productivity or institutions). These issues call for an identification strategy based on sectoral exports.

We divide *Apc* 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). We 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. This could be justified as we are now comparing exports in the same sectors; thus the price effects may be less relevant in this instance. 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 for each of the four sectors separately (for SVEs and non-SVEs separately):

$$X_{ijt} = \alpha_{it} + \lambda_{jt} + \gamma_{ij} + \delta_1 Apc_{ijt-1} + \varepsilon_{ijt} \tag{11}$$

and

$$\Delta X_{ijt} = \Delta\alpha_{it} + \Delta\lambda_{jt} + \Delta\gamma_{ij} + \Delta X_{ijt-1} + \delta_1 \Delta Apc_{ijt-1} + \Delta\varepsilon_{ijt} \tag{12}$$

where X is the (log of) value of exports (for country i, sector j and time t), Apc is (log of 1+) aid to productive capacity, α_{ij} is country-year fixed effects, λ_{jt} is time-varying sector fixed effects, γ_{ij} is sector-country fixed effects. Given the discussion above, we estimate (11) through OLS and (12) through GMM. Note that we do not have appropriate external instruments (i.e. country-sector-time specific variable) for Apc_{ijt}.

6.2 Data

We employ data from a variety of sources. Aid data come from the OECD/DAC (2009) Creditor Reporting System (CRS) database on disbursements. This database has covered a number of AfT activities since the mid-1970s, and reporting to the CRS is improving. However, before 1994 the data have substantial gaps; thus we base most of the analysis on the post-1994 period. We use different types of AfT data from this database, including aid for trade facilitation, aid for trade-related education, 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 1.

Data on investment climate indicators have become available for a large number of countries in the World Bank's *Doing Business Report*. These surveys cover the number of documents, and the time and costs required to change a certain regulation (e.g. registering property or dealing with licenses). We focus on indicators for trade across borders provided in the *Doing Business Report*.

Export data and data for most other controls, including population, CPI and GDP, are from World Bank (2009). We also use real effective exchange rates (REER) from

Box 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 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** *Aid to 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 subcomponents.
- **Apc** *Aid to Production Sectors*, coded as 300, includes the four sectors treated separately: Agriculture-Forestry-Fishing, Industry-Mining-Construction, Trade Policy, and Regulations and Tourism.
- **Atf** *Aid for Trade Facilitation*, coded as 33120, is a single category.
- **Atredu** *Aid to Trade Education/Training*, coded as 33181, is also a single category.

Tourism 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 the specific Livestock/veterinary services (31195). The same applies for *Fishing* (313), which incorporates five possible destinations for aid. Also, 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 the manufacturing and minerals sectors respectively in the analysis below.

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

IMF (2009). Data on bilateral distances between capital cities come from Mayer and Zignago (2006), who compute geodesic distances through the great circle formula. Data on foreign market potential are computed by Mayer (2008) for the period 1970–2003. Government effectiveness indicators come from Kaufmann *et al.* (2008), while the index of civil liberties is computed by Freedom House (2009). This index is measured on a scale of 1 to 7, where 1 represents the highest degree of freedom and 7 the lowest.

6.3 Results

AfT and the cost of trading

We first test for the impact of aid for trade facilitation (*Atf*) on the costs of exporting (through equation (8)), using a repeated cross-section of 89 developing countries for which data is available. Table 6.1 presents the results, which show a substantial cost-reducing effect of *Atf* on the cost of exporting.

Table 6.1. The effects of AfT on the costs of exports (without fixed effects)

	(1) lcosexp	(2) lcosexp	(3) lcosexp	(4) lcosexp	(5) Lcosexp	(6) ltimexp	(7) lcosexp	(8) lcosexp	(9) lcosexp
Atf (*t*−1)	−0.085[c]	−0.054[c]		−0.055[c]		−0.041[c]	−0.056[c]	−0.058[c]	−0.058[c]
	(−6.49)	(−5.23)		(−5.41)		(−4.20)	(−5.42)	(−4.01)	(−4.01)
Ln Atf (*t*−1)			−0.191[c]		−0.188[c]				
			(−4.39)		(−4.20)				
Atredu (*t*−1)								−0.255	-0.261
								(−1.45)	(−1.49)
Gov. Eff. (*t*−1)		−0.217[c]	−0.209[c]	−0.219[c]	−0.212[c]	−0.053	−0.218[c]	−0.172	-0.222[a]
		(−3.82)	(−3.73)	(−3.84)	(v3.77)	(−0.84)	(−3.82)	(−1.56)	(−1.98)
Ln pop		0.114	0.154	−0.027	−0.025	−0.005	0.110	−0.028	−0.043
(*t*−1)		(0.57)	(0.78)	(−1.56)	(−1.46)	(−0.38)	(0.54)	(−1.01)	(−1.60)
Ln pop		−0.004	−0.005				−0.004		
(*t*−1) sq.		(−0.66)	(−0.87)				(−0.62)		
GDP (*t*−1)		−0.002	−0.009	0.007	0.001	−0.134[c]	−0.002	−0.008	0.013
		(−0.059)	(−0.24)	(0.20)	(0.018)	(−3.30)	(−0.045)	(−0.11)	(0.19)
Landlocked		0.565[c]	0.570[c]	0.596[c]	0.601[c]	0.466[c]	0.565[c]	0.588[c]	0.516[c]
		(7.49)	(7.67)	(7.71)	(7.88)	(5.84)	(7.43)	(4.07)	(3.78)
Asia		−0.322[c]	−0.304[c]	−0.340[c]	−0.327[c]	0.038	−0.324[c]	−0.319[c]	−0.271[c]
		(−4.93)	(−4.67)	(−5.52)	(−5.35)	(0.70)	(−4.89)	(−3.36)	(−2.81)
America		−0.152[a]	−0.134	−0.178[b]	−0.159[a]	−0.069	−0.157[a]	−0.144	−0.166
		(−1.86)	(−1.65)	(−2.14)	(−1.93)	(−0.85)	(−1.84)	(−1.17)	(−1.31)
Europe		−0.348[c]	−0.322[c]	−0.396[c]	−0.370[c]	−0.426[c]	−0.348[c]	−0.090	−0.110
		(−3.27)	(−3.05)	(−3.62)	(−3.39)	(−2.88)	(−3.26)	(−0.49)	(−0.62)
Atf (*t*−1)[a] SVEs				−1.265[b]		−0.528			3.528[a]
				(−2.04)		(−1.05)			(1.90)
Ln Atf (*t*−1)[a] SVEs						−1.214[a]		0.012A	
					(−1.96)		(0.30)		
Atredu (*t*−1)[a] SVEs									−24.223[b]
									(−2.57)
Observations	203	201	201	201	201	201	201	89	89
R-squared	0.089	0.551	0.555	0.559	0.560	0.490	0.552	0.581	0.609

SVEs as defined by the WTO; Robust *t*-statistics in parentheses; [a]significant at 10 per cent; [b]significant at 5 per cent; [c]significant at 1 per cent.

The results reported in Table 6.1 suggest that a US$1 million increase in *Atf* (equivalent to a 171 per cent increase relative to the mean value) is associated with a 5.4 per cent (US$63) decrease in the cost of packing goods and loading them into a 20-foot container, transporting them to the port of departure and loading them on the vessel or truck (column 2). Considering that in 2000 the number of 20-foot containers loaded and unloaded in African ports reached almost 7.3 million, including 2.5 million in sub-Saharan countries (UNCTAD, 2003), the return on *Atf* is likely to be substantial. The control variables are in line with expectations: good governance reduces the costs of exports, while being landlocked considerably increases them. Asia and Europe have the lowest costs, and Africa has the highest.[17] The other variables, including population and GDP per capita, are not significant. The insignificance of the latter is surprising but it is likely to be determined by two contrasting effects: on the one hand, higher income per capita is associated with higher costs of non-tradables, which in turn drive the costs of exporting up; on the other hand, higher income tends to be associated with higher efficiency in handling transport, logistics and administrative procedures, which bring the costs down. This is confirmed by the negative and significant coefficient of GDP per capita when using the time of processing exports – whose value is purged of the price effect – as the dependent variable (column 6). The results are robust also to using the double-log specification as in (8') although in this case the cost reduction is much higher: a US$1 million increase in *Atf* is associated with a US$178 decrease in the costs of exporting (column 3).[18]

Importantly, this cost-reducing effect of *Atf* appears to be more relevant for SVEs than for other developing countries (column 4). This is also the case when using the double-log specification (column 5). When using the time taken to process exports the differential impact of Atf on SVEs is negative but insignificant, while *Atf* has a significant time-reducing impact (column 6). On the other hand, there is no differential impact of *Atf* on the costs of exporting for SVEs identified according to the WTO definition (column 7). This is a much broader (and loosely defined) category than the one defined by the Commonwealth Secretariat and that may explain the insignificant differential impact. We also test for the effects of aid to trade related education (*Atredu*) on the costs of exporting, finding a negative (though not significant) effect in a specification in levels (column 8). Interestingly, when we test for the differential impact of *Atf* and *Atredu* on SVEs, the latter turns out to have a significant reducing effect on the costs of exporting, while *Atf* has a differential positive impact (column 9) on SVEs. This reversal of the result of previous columns may be due to the restricted sample (less than half of the observations available) and to the high collinearity between the two SVEs' interaction terms.

Table 6.2 gives the results of the fixed effects specifications that relate the changes in *Atf* to the changes in the cost of exporting controlling for time invariant characteristics of countries. The coefficient of *Atf* is still significant but is half of that in the specification without fixed effects (column 1). Now an increase in *Atf* of US$1 million is associated with a reduction in the cost of exporting of around US$30 (i.e. 2.5 per

cent at the mean). This means that slightly over half of the impact of *Atf* is captured by time invariant characteristics of recipient countries. This elasticity is robust to the exclusion of Egypt, although it shrinks a little (column 2). Again, the double-log specification yields a higher *Atf* elasticity of cost reduction (column 3), which is around twice as large as that in column 1. On the other hand the intensity of the effect of *Atf* on the timing of exports is analogous to that on the cost of exporting (column 4), while it is smaller (and not significant) in the double-log specification (column 5). The coefficient of *Atf* remains robust also to the inclusion of the (log of the) number of documents necessary to export (column 6). *Atredu* is negative and significant in both specifications without and with *Atf* (columns 7–8).

We then test the impact of *Atf* separately for SVEs and non-SVEs (according to both definitions). In line with the results of the previous table we find that *Atf* has a (much) larger cost-reducing impact on SVEs than on non-SVEs. The coefficient for the former (column 9) is almost three times as large as that on the latter (column 10). This result is valid also when using the semi-log specification (results from the authors upon request). Interestingly, this result applies (with similar relative magnitudes) to the case of SVEs defined according to the WTO definition (compare columns 11 and 12), although the elasticity of cost reduction with respect to *Atf* is lower than for SVEs defined by the Commonwealth Secretariat (compare columns 9 and 11).

Overall, *Atf* seems to have a significant cost-reducing effect on the costs of handling exports, and back of the envelope calculations indicate that this appears to be an investment with an interesting return, especially for SVEs. These results appear all the more remarkable as cost of trading variables show substantial persistence over time especially considering the short timeframe of this analysis.

AfT and exports

Table 6.3 presents the results using the augmented export demand equation as in (9) estimated separately for SVEs and other developing countries. The results suggest the positive impact of aid to economic infrastructure (*Ainfra*) on exports, while aid to productive capacity (*Apc*) does not seem to have a significant effect on exports. However these effects appear to differ over time. The first two columns present the results of the estimation for the 1995–2007 period only. Neither *Ainfra* nor *Apc* seem to have a significant effect on exports of SVEs (and the latter has somewhat a negative impact). On the other hand *Ainfra* has a positive effect on non-SVEs, while *Apc* has no effect (column 2). Restricting the analysis to a more recent period (1999–2007) the effect of *Ainfra* on SVEs becomes more positive although it remains insignificant, while *Apc* becomes less negative. The coefficients of the aid variables are higher in the case of non-SVEs. Taking these results at their face value, they indicate that the support granted to the productive sector may have improved over time.[19] Also, the trade-related assistance seems to be more effective in raising exports for non-SVEs than for SVEs. However, we still need to control for the endogeneity of the aid variables.

Table 6.2. The effects of AfT on the costs of export (with fixed effects)

Sample	(1) All	(2) No Egypt	(3) All	(4) All	(5) All	(6) All	(7) TrEdu available	(8) TrEdu & TF available	(9) SVEs	(10) Others	(11) SVEs (WTO)	(12) Others (WTO)
Dep	ln(X Cost)	ln(X Cost)	ln(X Cost)	ln(Xtime)	ln(Xtime)	ln(X Cost)	ln(X Cost)	ln(X Cost)	ln(X Cost)	ln(X Cost)	ln(X Cost)	ln(X Cost)
Atf(*t*-1)	-0.025[c]	-0.020[b]		-0.024[c]		-0.018*		-0.029[c]				
	(-3.53)	(-2.26)		(-2.71)		(-3.16)		(-3.93)				
Ln Atf(*t*-1)			-0.074[b]		-0.048				-0.223	-0.079[b]	-0.150	-0.054
			(-2.14)		(-1.23)				(-1.34)	(-2.20)	(-1.68)	(-1.36)
Atredu(*t*-1)							-0.187[a]	-0.293[c]				
							(-1.90)	(-3.28)				
Gov. Eff. (*t*-1)	0.0986	0.0630	0.105	0.159	0.180	0.0618	0.355[a]	0.380[b]	0.0483	0.0969	0.121	0.130
	(0.78)	(0.49)	(0.79)	(0.75)	(0.84)	(0.61)	(1.78)	(2.18)	(0.26)	(0.58)	(0.60)	(0.84)
Ln pop	8.622[a]	5.960	10.27[a]	11.88	12.10	-0.277	3.846	20.71	-10.33	12.98[b]	-11.25	10.72
(*t*-1)	(1.83)	(1.16)	(1.84)	(1.30)	(1.24)	(-0.25)	(0.35)	(1.61)	(-0.87)	(2.30)	(-0.56)	(1.64)
Ln pop	-0.274[a]	-0.191	-0.326[a]	-0.383	-0.397		-0.170	-0.813[b]	0.260	-0.401[b]	0.234	-0.317
(*t*-1) sq.	(-1.91)	(-1.21)	(-1.89)	(-1.26)	(-1.23)		(-0.45)	(-2.31)	(0.58)	(-2.23)	(0.40)	(-1.56)
GDP (*t*-1)	0.0177	0.0762	0.232	-1.332[b]	-1.115	-0.150	-0.0572	-0.662	1.506[a]	0.230	0.0323	0.340
	(0.051)	(0.22)	(0.66)	(-2.04)	(-1.46)	(-0.44)	(-0.094)	(-1.07)	(1.91)	(0.58)	(0.031)	(0.94)
Ln documents						0.0222 (0.15)						
Constant	-59.87	-39.33	-74.37	-77.90	-79.35	12.54	-9.194	-102.9	88.18	-98.39[b]	123.8	-84.86
Observations	201	197	201	201	201	201	138	89	24	177	52	149
R-squared	0.372	0.335	0.330	0.361	0.342	0.353	0.208	0.561	0.770	0.327	0.511	0.328
Countries	86	85	86	86	86	86	76	48	11	75	25	61

All regressions include country and year effects; Robust *t*-statistics in parentheses; [a]significant at 10 per cent; [b]significant at 5 per cent; [c]significant at 1 per cent.

Table 6.3. Total exports and aid for trade (1995–2007)

Countries	(1) SVE	(2) Non-SVE	(3) SVE	(4) Non-SVE	(5) SVE	(6) Non-SVE
Period	1995–07	1995–07	1999–07	1999–07	1999–07	1999–07
Method	FE	FE	FE	FE	FE IV	FE IV
Aid for infrastructure	0.005	0.029[a]	0.023	0.032[b]	0.170	0.100[c]
(t–1)	(0.16)	(1.94)	(0.68)	(2.21)	(0.97)	(2.71)
Aid to productive capacity	–0.054	0.004	–0.044	0.020		
(t–1)	(–1.25)	(0.23)	(–1.08)	(1.47)		
CPI	0.475	–0.038	0.418	–0.082[b]	0.291	–0.061[c]
	(1.28)	(–0.89)	(0.88)	(–2.33)	(0.75)	(–3.15)
Market potential	–1.756	5.890[c]	0.799	5.088[c]	1.986	5.763[c]
	(–0.38)	(4.10)	(0.34)	(4.44)	(0.90)	(7.19)
Constant	33.704	–27.654[b]	11.978	–21.877[b]		
	(0.85)	(–2.29)	(0.62)	(–2.17)		
Observations	143	876	121	665	123	682
R-squared	0.571	0.641	0.505	0.649	0.299	0.609
Countries	17	83	17	83	17	82
Excluded instruments						
Civil liberties (t–3)					–0.280[a]	–0.465[c]
					(–1.71)	(–5.72)
1st stage F-Stat (for Aid for infra)					2.91	32.77

Dependent variable is value of total exports in constant 2000 US$. All variables are in log; all regressions include year effects; Robust t-statistics in parentheses; [a]significant at 10%; [b]significant at 5%; [c]significant at 1%.

We do that only for the *Ainfra* variable for a number of reasons. First, we have one reliable excludable instrument available – civil liberties (CL) – and that happens to explain a much larger part of *Ainfra* than *Apc*. Second, leaving *Apc* out in the estimation of equation (9) turns out to affect the value of *Ainfra* (and the explanatory power of the regression) very marginally, while the opposite is not true (not shown here). The results are presented in columns 5 and 6. The coefficient of *Ainfra* seems to be robust to the endogeneity of aid; and the IV estimation (using CL as instrument for *Ainfra*) suggests that this endogeneity biases the coefficient of *Ainfra* downward. The IV coefficient is three times larger than the OLS one for non-SVEs (column 6 compared with column 4) and over six times larger for SVEs (column 5 compared with column 3). The value of the F-statistics of the first stage together with the high significance of the CL coefficient indicates that the latter is a valid instrument for *Ainfra*. The downward bias from endogeneity may suggest that countries with poorer export capacity tend to receive proportionally more aid, which is somewhat intuitive. This is especially true for SVEs. Correcting for this bias makes the *Ainfra* coefficient larger for SVEs than for non-SVEs. This may represent some suggestive evidence of a differential effect of aid to infrastructure to SVEs: export performance in these countries seems to be more positively affected by support to infrastructure than in other developing

countries. This is consistent with the idea that SVEs are relatively isolated from the main markets and because of that and their small populations, they suffer from an under-provision of trade-related infrastructure.

In order to take into account the persistence of exports, we employ the dynamic specification described by equation (10) estimated through system-GMM. Table 6.4 presents the results, which confirm the main findings of the previous analysis. For the period 1995–2007, the aid variables have an insignificant effect on exports for SVEs (column 1), while *Ainfra* has a positive impact for non-SVEs (column 2). In the period 1999–2007 the impact of *Ainfra* on exports appears to be more positive for SVEs (column 3) than for non-SVEs (column 4), while *Apc* has a negative sign for SVEs (although it is not significant). These results change when lagging the aid variables two years. In the case of SVEs the coefficients of both aid variables become smaller (column 5), while that of *Ainfra* magnifies for non-SVEs (column 6). This suggests that the bulk of the effects of *Ainfra* on exports occurs over a shorter timeframe for SVEs relative to non-SVEs.

Table 6.4. Total exports and aid for trade, GMM estimation

	(1)	(2)	(3)	(4)	(5)	(6)
Period	**1995–07**	**1995–07**	**1999–07**	**1999–07**	**1999–07**	**1999–07**
Countries	**SVE**	**Non-SVE**	**SVE**	**Non-SVE**	**SVE**	**Non-SVE**
Sample	**Aid>0**	**Aid>0**	**All**	**All**	**All**	**All**
Exports (t–1)	0.988[c]	0.990[c]	0.989[c]	0.993[c]	0.992[c]	0.996[c]
	(91.2)	(202)	(77.2)	(151)	(85.1)	(185)
Aid for infra	0.004	0.013[b]	0.014	0.010		
(t–1)	(0.44)	(2.29)	(1.31)	(1.62)		
Aid to productive	–0.019	–0.005	–0.023	0.006		
capacity (t–1)	(–1.33)	(–0.57)	(–1.24)	(0.55)		
Aid for infra					0.004	0.018[c]
(t–2)					(0.47)	(2.74)
Aid to productive					–0.014	–0.008
capacity (t–2)					(–1.03)	(–0.78)
CPI	0.052	–0.003	0.063	–0.019[a]	0.037	–0.020[b]
	(0.61)	(–0.27)	(0.51)	(–1.90)	(0.30)	(–2.11)
Market potential	–0.006	0.019	–0.003	0.039[b]	–0.015	0.035[b]
	(–0.14)	(1.47)	(–0.056)	(2.25)	(–0.31)	(2.23)
Observations	142	869	120	660	118	652
Countries	17	82	17	82	17	82

Dependent variable is value of total exports in constant 2000 US$. All regressions are estimated through the GMM-system estimator. All variables are in log; endogenous variables are lagged exports; *Ainfra* and *Apc* across all the specifications; civil liberties is included as excluded instrument in all regressions include year effects. Robust t-statistics in parentheses; [a]significant at 10 per cent; [b]significant at 5 per cent; [c]significant at 1 per cent.

AfT and sectoral exports

We also examine the effects of the two main types of AfT on exports in four broad sectors separately using both specifications (11) and (12). The results are presented in Table 6.5 for tourism and food, and in Table 6.6 for manufacturing and minerals. For each sector we estimate separately for SVEs and non-SVEs a static specification with fixed and year effects and a dynamic specification with system GMM. The period we consider is 1999–2006. As far as tourism is concerned, the results suggest that sectoral aid (i.e. aid to productive capacity in the tourism sector) is particularly beneficial in SVEs (the coefficient is three times that for non-SVEs). On the other hand *Ainfra* is not significant for either group, suggesting that tourism exports are not highly constrained by the lack of infrastructure. This may not be surprising as many SVEs are heavily reliant on tourism, and activities that support the development of the sector may have high returns for export activities. AfT seems to be ineffective for food exports in SVEs (columns 5 and 7), while sectoral aid has a positive effect on exports for non-SVEs (columns 6 and 8). Similarly, the impact of AfT is negligible on manufacturing exports in SVEs, while *Ainfra* has a positive effect in non-SVEs (columns 1–4, Table 6.6). Finally, AfT appears to have a positive (although significant only for *Ainfra* in the FE specification, see column 5) effect on mineral exports in SVEs, especially as far as sectoral aid is concerned (column 7), but not in other developing countries (columns 6 and 8).

Table 6.5. Sectoral exports and aid for trade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Tourism				Food			
Sample	SVE	Non-SVE	SVE	Non-SVE	SVE	Non-SVE	SVE	Non-SVE
Method	FE	FE	Sys-GMM	Sys-GMM	FE	FE	Sys-GMM	Sys-GMM
Aid sector (t-1)	0.153	0.007	0.196	0.064[a]	-0.157	0.058	-0.047	0.049[b]
	(0.50)	(0.12)	(1.30)	(1.88)	(-1.71)	(1.54)	(-0.57)	(2.31)
Aid Infra (t-1)	-0.071	-0.001	-0.001	-0.008	0.139	0.044	-0.002	-0.007
	(-1.05)	(-0.043)	(-0.026)	(-0.67)	(1.37)	(1.14)	(-0.033)	(-0.39)
CPI	-0.266	0.034	0.194[a]	-0.017	-1.403	-0.102	-0.068	-0.010
	(-1.17)	(0.39)	(1.98)	(-0.52)	(-1.57)	(-1.48)	(-0.15)	(-0.32)
Market Potential	3.303	2.908	0.012	0.150[c]	6.285	1.878	-0.113	0.092[c]
	(1.29)	(1.08)	(0.15)	(2.79)	(1.30)	(0.80)	(-0.80)	(2.78)
Pop	-7.373	8.091	-0.196	-0.039	-16.805	-32.295	-0.171	0.087
	(-0.53)	(0.92)	(-0.60)	(-0.30)	(-0.52)	(-1.49)	(-0.26)	(1.09)
Pop squared	0.345	-0.278	0.008	0.002	0.795	0.944	0.009	-0.003
	(0.60)	(-0.99)	(0.59)	(0.57)	(0.64)	(1.42)	(0.33)	(-1.02)
Exports (t-1)			0.979[c]	0.947[c]			0.931[c]	0.981[c]
			(49.1)	(46.6)			(31.7)	(70.2)
Constant	29.001	-62.788			53.346	278.102[a]		
	(0.32)	(-0.77)			(0.23)	(1.71)		
Excl. instrument		CL		CL		CL		CL
Observations	161	625	158	620	147	606	135	580
Countries	25	86	25	86	25	86	23	82
R-squared	0.266	0.445			0.254	0.296		

Notes: Dependent variable is value of exports of the sector indicated in the second row; all regressions include year and country effects; all variables are in log; endogenous variables in the GMM specifications are lagged exports; *Ainfra* and *Apc*; all regressions include year effects; Robust t-statistics in parentheses; [a]significant at 10 per cent; [b]significant at 5 per cent; [c]significant at 1 per cent.

Table 6.6. Sectoral exports and aid for trade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Manufacturing				Minerals		
Sample	SVE	Non-SVE	SVE	Non-SVE	SVE	Non-SVE	SVE	Non-SVE
Method	FE	FE	Sys-GMM	Sys-GMM	FE	FE	Sys-GMM	Sys-GMM
Aid sector (t-1)	-0.278	0.009	0.027	-0.001	0.038	-0.096	0.329	-0.011
	(-0.65)	(0.32)	(0.15)	(-0.049)	(0.18)	(-1.58)	(1.22)	(-0.22)
Aid Infra (t-1)	-0.113	0.048	-0.073	0.029	0.405[b]	-0.032	0.128	0.012
	(-1.13)	(1.24)	(-0.97)	(1.32)	(2.09)	(-0.71)	(0.62)	(0.47)
CPI	0.576	0.035	0.622[b]	0.064[b]	1.769	-0.082	0.908	-0.034
	(0.95)	(0.76)	(2.11)	(2.42)	(1.00)	(-1.09)	(1.53)	(-0.80)
Market potential	16.238	2.754[b]	-0.026	0.100[b]	-16.62[a]	3.395[a]	-0.049	0.019
	(1.16)	(2.01)	(-0.22)	(2.29)	(-1.84)	(1.87)	(-0.11)	(0.29)
Pop	9.686	-8.967	-0.906	0.055	-107.17	-10.37	-0.648	-0.154
	(0.34)	(-0.82)	(-1.51)	(0.52)	(-1.07)	(-0.97)	(-0.21)	(-0.80)
Pop squared	v0.511	0.320	0.038	-0.001	3.721	0.298	0.036	0.006
	(-0.43)	(0.96)	(1.55)	(-0.35)	(1.04)	(0.88)	(0.29)	(0.97)
Exports (t-1)			0.962[c]	0.974[c]			0.804[c]	0.946[c]
			(26.5)	(77.6)			(8.66)	(49.2)
Constant	-163.25	56.724			904.432	79.210		
	(-0.62)	(0.58)			(1.35)	(0.83)		
Excl. instrument		CL		CL		CL		CL
Observations	147	603	135	577	141	606	128	580
R-squared	0.156	0.392			0.144	0.405		
Countries	25	86	23	81	24	86	23	82

Dependent variable is value of exports of the sector indicated in the second row; all regressions include year and country effects; all variables are in log; endogenous variables in the GMM specifications are lagged exports; *Ainfra* and *Apc*; all regressions include year effects; Robust t-statistics in parentheses; [a]significant at 10 per cent; [b]significant at 5 per cent; [c]significant at 1 per cent..