

## Export Promotion Agencies: What Works and What Doesn't\*

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### Abstract

The number of national export promotion agencies (EPAs) has tripled over the past two decades. While more countries have made them part of their national export strategy, studies have criticized their efficiency in developing countries (Hogan, Keesing and Singer, 1991). Partly in reaction to these critiques, EPAs have been retooled (see ITC, 1998 or 2000 for example). This paper studies the impact of existing EPAs and their strategies, based on a new data set covering 104 developing and developed countries. Results suggest that on average they have a strong and statistically significant impact on exports. For each \$1 of export promotion, we estimate a \$40 increase in exports for the median EPA. However, there is heterogeneity across regions, levels of development and types of instruments. Furthermore, there are strong diminishing returns, suggesting that as far as EPAs are concerned small is beautiful.

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# 1 Introduction

In 1985, in the midst of the highest levels of hyperinflation ever recorded in the history of the Bolivian economy, President Victor Paz Estenssoro proclaimed that the country was in its death throes and that it could survive only by exporting more of its production. Thus, the phrase “export or die” was coined. As part of the reform package –whose cornerstone was to reduce inflation and introduce macroeconomic stability– an export promotion agency (EPA) was created (INPEX).

Bolivia’s search for development through exports is not exceptional. The first EPA – still existing– was created in 1919 in Finland, and in the mid-1960s they became a popular instrument to boost exports and reduce trade deficits, under the auspices of the International Trade Center (a joint UNCTAD-GATT multilateral organization). By the early 1990s their efficiency began to be questioned (Keesing and Singer, 1991 and 1991a). EPAs in developing countries were criticized for lacking strong leadership, being inadequately funded, hiring staff which was bureaucratic and not client oriented, and suffering from government involvement.<sup>1</sup> As a result, many development institutions withdrew their support to EPAs.<sup>2</sup> Part of the blame for the failure of the early EPAs was put on the import substituting trade regimes that prevailed at the time. Overcoming such a strong anti-trade bias was probably too much to ask of any specialized agency. However, more than a decade later, the trade environment has significantly changed in the developing world and some EPAs under the auspices of the ITC have evolved in the direction suggested by Hogan, Keesing and Singer (1991) in their influential piece.<sup>3</sup> The objective of this paper is to provide an assessment of the impact of today’s EPAs on national exports.

The objective of EPAs is to help (potential) exporters find markets for their products, as

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<sup>1</sup>Similar critiques emerged for EPAs in developed countries; see for example Kotabe and Czinkota (1992) study of the United States sub-national EPAs.

<sup>2</sup>Of the 73 export promotion agencies in developing countries surveyed for this paper only 21 had some budgetary support from multilateral donors in 2005, and in only 11 agencies the budgetary support from multilateral donors represented more than 25 percent of the total budget. In the case of one Sub-Saharan Africa agency more than 75 percent of its budget in 2005 came from multilateral donors.

<sup>3</sup>That is there is more private sector involvement, larger funding, and a stronger organization and leadership.

well as provide them with a better understanding of products demanded in different export markets. One can divide the services offered by EPAs into four broad categories: 1) country image building (advertising, promotional events, but also advocacy); 2) export support services (exporter training, technical assistance, capacity building, including regulatory compliance, information on trade finance, logistics, customs, packaging, pricing); 3) marketing (trade fairs, exporter and importer missions, follow-up services offered by representatives abroad); and 4) market research and publications (general, sector, and firm level information, such as market surveys, on-line information on export markets, publications encouraging firms to export, importer and exporter contact databases).

The economic justification for government involvement in export promotion is based on the theory of asymmetric information and other market failures. There are important externalities associated with the gathering of foreign market information related to consumer preferences, business opportunities, quality and technical requirements, etc. Private firms alone will not provide foreign market information, as companies hesitate to incur research and marketing costs that can also benefit competitors. The same applies to pioneer exporters, who make a considerable investment in attempts to open foreign markets, cultivating contacts, establish distribution chains and other costly activities that can be used by their rivals (Hausmann and Rodrik, 2003). Higher uncertainty associated with trading across borders in markets with different legislation have also been put forward as a justification for export insurance schemes supported by the public sector.<sup>4</sup>

From an economic perspective the argument for public funding of EPAs needs to be based on an assessment of the social costs and benefits associated with the activities of the EPA. Social benefits are likely to be larger than the social costs if there are large positive externalities associated with higher current exports across firms, sectors or time and within the exporting country.<sup>5</sup>

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<sup>4</sup>See Greenaway and Kneller (2005) for a recent survey of the literature on trade and externalities. For a more skpetic view, see Panagariya (2000).

<sup>5</sup>Note that some of these externalities may travel across borders. It is clear that some of the benefits from export promotion activities can be captured by consumers in the importing country for whom search costs are reduced. This undermines the case for national government funding of export promotion programs and calls

It should be clear that program evaluation of EPAs on economic welfare grounds is difficult if not impossible. Thus often –if not always– evaluations of EPAs stop short of an assessment based on welfare grounds, and focus on the more modest objective of assessing whether exports have increased or whether new markets have been opened. This paper is no exception. Our goal is twofold: first to determine whether EPAs are having an impact on exports; and second, to identify the activities and institutional structures of agencies that seem to have positive effects on exports.

In order to answer these questions we undertook a world survey of national EPAs to gather information on their objectives, activities and institutional structure. To answer the questions of what works and what does not work, we then try to econometrically identify the impact on exports of different institutional structures, objectives and activities.

The resulting evidence suggests that on average EPAs have a positive and statistically significant impact on national exports. There is heterogeneity across levels of development, as the efficiency of EPA monotonically increases with GDP per capita. There is also heterogeneity across regions: larger impacts are found in Eastern Europe and Asia, Latin America, and Sub-Saharan Africa, with agencies in the Middle East and North Africa lagging behind.

There is also evidence that there are important decreasing returns to scale in resources devoted to export promotion, and even negative marginal returns for budgets above a certain level (estimated at \$ 1 per capita). Thus, as far as EPAs are concerned, small is beautiful.

In terms of what type of institutional arrangements, objectives and activities lead to a stronger impact on exports our results suggest the following. EPAs should have a large share of the executive board in the hands of the private sector, but a large share of their budget should be publicly funded. The proliferation of small agencies within a country leads to an overall less effective program. EPAs are more effective when focusing on non-traditional exports, or have some broad sector focus (e.g., agriculture, manufacturing, tourism, high-tech, etc...). They should also focus their activities on large firms (which can take advantage of EPAs services), but which are not yet exporters. The use of office representation abroad

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for multilateral interventions.

has a positive impact on exports in the full sample, but a negative impact in a sub-sample of developing countries, suggesting that in poorer countries EPAs efforts should focus on on-shore activities.

The rest of this paper is organized as follows. Section 2 reviews the existing literature on export promotion. Section 3 describes our global survey of EPAs and provides some descriptive statistics to help understand the objectives, activities, and institutional structures that exist in EPAs around the world. Section 4 describes the econometric strategy. Section 5 provides the empirical results, and section 6 concludes.

## **2 EPAs: What do we know so far?**

As far as we are aware, there has been no cross-country statistical analysis of the impact of EPAs on exports. The exception is perhaps Rose (2007), who estimates the impact that the presence of an embassy or consulate may have on bilateral trade using a gravity model. Rose argues that as communication costs fall, foreign embassies and consulates have lost much of their role in decision-making and information-gathering, and therefore are increasingly marketing themselves as agents of export promotion. In a sample of twenty-two exporting countries –of which eight are developing countries– and around 200 potential trading partners he finds that for each additional consulate abroad, exports increase by 6 to 10 percent.

The bulk of the empirical literature that has looked more closely at the effectiveness of export promotion has focused on agencies in developed countries, particularly the United States. There have been two broad approaches. One relies on surveys of random samples of exporters and potential exporters, asking which programs they have made use of, their opinions of these programs, and the success they have had in exporting. Kedia and Chhokar (1986), for example, found that export promotion programs in the United States have little impact, largely because of a lack of awareness of their programs. Seringhaus and Botschen (1991) surveyed the opinion of nearly 600 firms in both Canada and Austria, and found that export promotion service use was low, and the programs were not addressing the needs of exporters.

Gencturk and Kotabe (2001) tested the link between program usage and export performance in a sample of 162 US firms, and found that usage of export programs increased profitability, but not sales, which suggests that there were no externalities across firms, and that export programs represented a mere transfer from agencies to the exporting firm. Gencturk and Kotabe also found that experienced exporters benefited from government programs in terms of profitability more than new exporters. Despite their criticism of existing programs, these studies do support the argument, however, that EPAs are a response to a genuine need of small and medium-sized firms, and that they can be crucial for export success.<sup>6</sup>

In the late 1980s, the World Bank undertook an assessment of existing EPAs in the developing world (Hogan, Keesing and Singer, 1991). The report argued that a consensus had emerged with a strong negative view of EPAs in developing countries. In a series of influential studies (Keesing and Singer, 1991, 1991a) the authors argued that EPAs had failed to achieve their goals and in many instances had had a negative impact, except in those countries that already had favorable policies *vis-à-vis* exports, namely Singapore, Hong Kong, Korea, and Taiwan (Keesing, 1993). A series of weaknesses were noted: EPAs were staffed with poorly trained civil servants who were out of touch with their clients in the private sector; these public sector organizations did not provide the incentives to ensure a high-quality service to exporters; agencies failed to address the major supply constraints on exporters, which were often not marketing-related, particularly in environments where import substitution policies prevailed.

Others (Hogan, 1991, de Wulf, 2001) argued that the key problem with EPAs was their lack of funding and that bad policy environments could be overcome by well funded EPAs, as the examples of Korea, China and Taiwan - contrary to Keesing's argument - in fact demonstrated. Hogan also argued that the one-size fits all solution often advocated by donors was ill-suited, and different environments required different structures.

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<sup>6</sup>Czinkota (2002) argues that governments should lead efforts to help firms appreciate that they are ready for export or learn what they need to do to get ready. Many executives do not initiate export activities because of their uncertainty about new factors such as variable currency exchange rates, greater distances, new government regulations, new legal and financial systems, etc. The government is well positioned to help firms overcome such information failures.

In spite of the strong criticisms, EPAs were not abandoned. Indeed, the number of publicly funded agencies increased over the course of the 1990s. More recently, the development literature has taken a slightly more positive view of the potential role of export promotion agencies in poor countries. The rationale underlying the criticisms of Keesing and Singer (1991, 1991a) was that the early failures of EPAs were mainly due to import substitution policies that made the job of EPAs very difficult. In the 1990s, that strong bias against exports vanished, and prominent development economists have adopted a more benign view of EPAs. For example, in a study of how governments can promote non-traditional exports in Africa, one of the main recommendations of G.K.Helleiner –who led the study– was to create an adequately funded EPA to help exporters overcome the costs and risks of entering unfamiliar and demanding international markets (Helleiner, 2002).

In terms of what type of program, institutional set-up, and financing is more likely to succeed, Alvarez (2004) provided evidence from a survey of 295 small-and-medium-sized sporadic and permanent exporters in Chile. While trade shows and trade missions did not affect the probability of being a successful exporter, a program of exporter committees showed a positive and significant impact. Such committees are composed of a group of firms with common objectives in international business, which cooperate on research, marketing and promotion.

Macario (2000) identified the policies that determine successes and failures in Brazil, Chile, Colombia, and Mexico. On the basis of interviews with successful exporters, she sets out various recommendations for export promotion agencies: they should be directed at firms with new products or who are entering new markets; they should emphasize cost-sharing to ensure that programs are used only by those truly dedicated to export; support should be given for a maximum of 2-3 years so that it does not turn into a subsidy; programs should be submitted to external evaluation; agencies work best when they are subject to a mix of public and private management.

The conclusion about private management is shared by the ITC (see for example ITC, 2000), and by much of the early literature (Keesing and Singer, 1991a 1991b, de Wulf, 2001).<sup>7</sup>

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<sup>7</sup>The ITC also provides constantly updated information about best practices and advice on export promotion strategies (see <http://www.intracen.org/instasptp>), and their annual conferences are an useful tool for

However, the view that the focus should be on new products and entering new markets is not shared by everyone. Indeed, ITC (1998) or Boston Consulting (2004) suggest that it is most useful to target firms that are “threshold” or “mature” exporters, as inappropriate targeting at the firm level can be wasteful.

In his survey of the early literature, de Wulf (2001) stressed the importance of emphasizing on-shore activities. EPAs have traditionally focused on off-shore activities, such as information gathering, trade fairs and trade representation, sometimes neglecting the importance of home country supply conditions.

Our global survey of EPAs sheds light on some of the old and current debates. As noted by Hogan (2001), heterogeneity of environment, structures, policies and their impact are an important concern that we will try to seriously address. Nonetheless, cross-country analysis inherently limit the extent to which the heterogeneity of impacts can be addressed.<sup>8</sup> Ultimately, this type of exercise must be complemented with country-specific case studies.

### **3 Survey of EPAs: Summary statistics**

During the summer and fall of 2005 we conducted an eighteen question survey of EPAs around the world.<sup>9</sup> Through the ITC website ([www.intracen.org/tpo](http://www.intracen.org/tpo)) we obtained a database with contact information. We complemented this list with the help of many World Bank country economists who provided contact information for national EPAs. We contacted agencies or Ministries in 147 countries. In 31 countries we were informed that there was no national EPA. The surveys was sent to 116 countries and 92 answered (of which 4 responded that they could not respond). Each of the 88 surveys that we received was followed up with phone conversations to confirm and clarify some of the answers. The list of 88 agencies appears in the Appendix Table. All countries in the sample are classified by geographic regions.

The survey contains five parts: i) institutional structure, ii) responsibilities of the agency,

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agencies from different part of the world to compare strategies.

<sup>8</sup>Although we do test for the existence of heterogeneity across countries, if fully addressed one is likely to run out of degrees of freedom.

<sup>9</sup>The survey is available from the authors upon request.

iii) the strategies followed, iv) resources and expenditures, and v) activities and functions. Below we provide summary statistics by region.

### 3.1 Institutional Structure

Around 10 percent of agencies surveyed are fully private; another 5 percent are joint public private entities. The bulk of the agencies –62 percent– are semi-autonomous entities reporting to a Ministry or the Office of the President or the Prime Minister. The remainder –23 percent of the agencies– are sub-units of a Ministry, and therefore subject to government hiring regulations, and pay scales. The regions with the lowest percentage of agencies structured as a sub-unit of a Ministry are the Middle East and North Africa (MENA) and Sub-Saharan Africa (SSA), where only 11 percent of agencies are under the direct control of a Ministry. The region with the highest percentage of agencies under a sub-unit of a Ministry is Eastern Europe and Asia (EEA) with 36 percent. Latin America and the Caribbean (LAC) is below average with 17 percent of its agencies subject to the direct control of a Ministry.

Within the 73 agencies that reported having an executive board, on average half the seats in the board –53 percent to be precise– represent the private sector. Figure 1 shows the distribution of the share of seats granted to the private sector by region. The largest share is among OECD agencies, and within the developing world LAC has the highest median at 58 percent.

Finally, 80 percent of the agencies are either the only export promotion agency in the country or are clearly the largest and most important, although there are significant public and private agencies working in closely related areas. This includes umbrella organizations in which all private sector associations are members. In 20 percent of the countries surveyed there are 2 or more agencies of equal importance. There are few differences across regions, but SSA is the region where multiple EPAs are most rare.

## 3.2 Responsibilities

In terms of responsibilities, we explored whether the agency in charge of export promotion activities was exclusively dedicated to export promotion, and if not, we asked the degree of priority granted to export promotion within the agency. Figure 2 summarizes the degree of priority given to export promotion across regions. There is a contrast between the OECD, and MENA on the one hand, and LAC and EEA, on the other. For the former, export promotion is the top priority of the agencies (values 1 and 2 in the histogram) in almost 70 to 80 percent of the countries. In the second group, the agencies for which export promotion is the top priority represent 50 percent of the cases.

## 3.3 Objectives and Strategies

The main objective pursued by 60 percent of the agencies surveyed is to increase aggregate exports, no matter which sector or how big or small the export volumes. Around 18 percent of agencies aim to promote non traditional exports only, and around 20 percent target specific sectors. Around 2 percent attempt to develop industrial clusters, and other objectives. There are some interesting differences across regions, as illustrated in Figure 3. Clearly, the objective of OECD agencies is primarily to promote overall exports, whereas in LAC the promotion of non-traditional exports is the most frequent strategy. In EEA, MENA, and SSA the focus on particular sectors is more common than elsewhere –even though most agencies in these regions focus primarily on overall exports.

We also asked the agencies whether the export promotion strategy was part of a national economic development plan. Almost 80 percent of agencies answered that this was the case, but again there are some interesting differences across regions: 60 percent of OECD agencies answered yes; 65 percent in LAC; 70 percent in MENA; 89 percent in SSA, and 100 percent in EEA.

### **3.4 Resources and Expenditures**

The average budget of EPAs surveyed is around 0.11 percent of the value of exports of goods and services, with a standard deviation of 0.35 and a median of 0.04 percent. The region with the largest average budget is LAC at 0.17 percent of exports. It is followed by EEA at 0.12 percent, and then MENA, SSA, and the OECD with average budgets of around 0.09 to 0.10 percent of exports. The distribution within regions varies as shown in Figure 4. The OECD has the bulk of its agencies' budget between 0.03 and 0.13 percent of exports (agencies within the 25th and 75th percentile). In SSA, the bulk of the agencies is between 0.00 and 0.05; the large mean is explained by the fact that a few countries have extremely large budgets relative to exports, often supported by multilateral and bilateral donors.

Regarding funding sources, around 52 percent of the agencies obtained more than 75 percent of their budget from public funding; 2 percent of the agencies obtained more than 75 percent of their budget from private funding; 3 percent of the agencies obtained more than 75 percent of their budget from selling their services (customer fees); and 2 percent of the agencies obtained more than 75 percent of their budget from either multilateral or bilateral donors. Thus, public funding seems to predominate as a source of funding. Three quarters of the agencies surveyed had no private funding, and half had no income associated with the selling of their services. When they reported some income, it represented on average less than 10 percent of their budget. The importance of public funding varies across regions as illustrated in Figure 5. The region where public funding may be less predominant is Latin America, where only 35 percent of the agencies reported that public funding represented more than 75 percent of their total budget. The largest share of agencies funded at more than 75 percent by public funding is found in EEA.

### **3.5 Activities and client orientation**

We considered four main activities: 1) country image building (advertising, promotional events, but also advocacy); 2) export support services (exporter training, technical assistance, capacity building, including regulatory compliance, information on trade finance, logis-

tics, customs, packaging, pricing); 3) marketing (trade fairs, exporter and importer missions, follow-up services offered by representatives abroad); and 4) market research and publications (general, sector and firm level information, such as market surveys, on-line information on export markets and electronic bulletin, publications encouraging firms to export, importer and exporter contact databases). Figure 6 provides a view of the share spent on each of these activities by region. The largest share is generally spent on marketing and market research and publications. Another item which shows a large median –but also a much larger variance– is other activities not related to export promotion, except in the OECD, where the bulk (more than 75 percent of them) spent less than 10 percent on activities not related to export promotion. At the opposite end, in SSA other activities not related to export promotion represent between 10 and 25 percent of the budget of most agencies (at the median). The importance of export support services is also much larger in SSA than in other regions. In LAC, EEA and MENA the distribution of the budget allocated to each activity is very similar.

In terms of client orientation, the data cover the percentage of expenditures spent on large versus small and medium size firms, and established versus new and occasional exporters. Results are quite clear across regions. A very small share of total expenditure is spent on large firms, whereas a relatively large share is spent on established exporters. Thus, in all regions the focus of the agencies is on small and medium size firms that are established exporters. As shown in Figure 7, LAC and SSA agencies are at opposite ends when it comes to the share of expenditure on established firms (with LAC having the highest share and SSA the lowest).

In terms of representation abroad, 41 percent of the agencies have offices abroad (22 percent of the agencies in SSA, 33 percent of the agencies in MENA, 35 percent of the agencies in LAC, 47 percent in EEA and 67 percent in the OECD). In most regions agencies spend a small amount of their budget on offices abroad, with the exception of the OECD where on average 39 percent of the EPA budget is dedicated to offices abroad. In other regions, the average is 7 percent in LAC and EEA, 4 percent in SSA, and 1 percent in MENA. In terms of the geographic coverage of the agencies abroad, Figure 8 highlights the importance in the

expenditures of Western Europe and North America (Canada and the United States). In all regions, with the exception of LAC, export promotion agencies spend a larger share of their budget for offices abroad in Western Europe.

## 4 The empirical framework

Our objective is to disentangle the effects of export promotion agencies, their structure, responsibilities, strategies, resources and activities on overall exports in order to understand what works and what doesn't. The first step is to explore whether there is any correlation between export promotion budgets and exports. Figure 9 provides a plot of exports per capita on EPA budgets per capita. There is a clear positive correlation between these two variables. Figure 9 also provides the predicted value obtained from the corresponding locally weighted regression (*lowess*), which provides us with some *prima-facie* evidence of which are the agencies that are under-performing in terms of exports per capita given their budgets.<sup>10</sup> For example Rwanda (RWA) would be expected to have a much higher level of exports given the budget of its EPA (under-performer), whereas the Irish agency (IRL) would be expected to have a lower level of exports (over-performer).

An interesting feature is that the curve flattens at very high budgets. Most of the countries among this group of high-budget agencies are developed countries. To test for heterogeneity between developed and developing countries we divided the sample accordingly. Figure 10 shows the two scatter plots. Clearly, the positive correlation is driven by developing country data, and the correlation between exports and the budget of export promotion agencies is unclear within the sub-sample of developed countries.

There are three clear problems with the correlations discussed above. First, the sample might be biased, because it is restricted to the agencies for which we were able to find a local contact. It is further restricted to agencies that answered the survey, even though we had a

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<sup>10</sup>An in depth and robust analysis of each agency performance is beyond the scope of this paper and would need to be tackled through agency-specific studies. In this paper, we limit the scope at providing averages across different groups and variables.

perhaps surprisingly high 76 percent response rate.<sup>11</sup> Second, other factors could be correlated with both exports and EPA budgets, which will also result in spurious correlations between the two variables of interest. Third, the direction of causality might go from exports to the EPA budgets, as countries with higher exports might tend to provide more generous funding to their EPAs than other countries.

We correct selection bias by using a selection equation (Heckman, 1979) that explains why some countries were not surveyed, and why some agencies did not answer. Our experience collecting contact information for EPAs helped us identify variables that should be part of this selection equation. It was clear that in poorer and smaller countries it was more difficult to obtain contact information for the relevant Ministry or institution, and even when we did, it was difficult to get them to answer the survey. So GDP per capita and GDP are part of the selection equation. Aid per capita also seemed to be an important determinant because many of the poorest agencies were substantially funded by bilateral and multilateral donors. More formally, the selection equation that explains the latent variable  $z_c^*$ , which captures the likelihood of obtaining a response to the export promotion survey in country  $c$ , is given by:

$$z_c^* = \xi' \mathbf{x}_c + \varepsilon_c; \tag{1}$$

$$z_c = \begin{cases} 1 & \text{if } z_c^* > 0 \\ 0 & \text{otherwise} \end{cases}$$

where  $\xi$  is a vector of parameters and  $\mathbf{x}_c$  is a matrix of independent variables determining the probability that the EPA in country  $c$  answered the survey. The latter includes variables explaining exports below, except the budget of the EPA and the activities of the agency that help us identify the export equation plus the log of GDP, the log of aid per capita discussed above, and dummy variables identifying developing countries in Africa, EEA, Latin America, Sub-Saharan Africa, and the OECD.

Regarding the endogeneity of export promotion, we control for numerous determinants of exports that may be also correlated with export promotion budgets. The control variables

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<sup>11</sup>Even with such a high response rate, it may still not be a representative sample.

we considered are: GDP per capita, an index of trade restrictiveness imposed on imports, an index of trade restrictiveness faced by each country's exports in the rest of the world, volatility of the exchange rate, an indicator of the regulatory burden that measures the average number of days it takes to comply with all necessary regulations to export goods, the geography-determined trade to GDP ratio, and regional dummies for EEA, LAC, MENA, SSA, and the OECD. We also estimated specifications with infrastructure variables (share of paved roads, main telephone lines per capita) and indices of institutional quality (ICRG indices) as control variables. These are highly collinear with GDP per capita and were not statistically significant. Moreover, in some cases they significantly reduced our sample because of missing data. Since this paper is about what works in terms of export promotion, and these variables did not affect qualitatively our results on export promotion, we do not report these specifications.

Nevertheless, reverse causality and omitted-variable bias may still be problematic. In order to address these issues, we offer two alternatives. First, we estimate a treatment effect regression where we use as instruments the log of aid per capita and regional dummies. In this treatment regression we also control for sample selection bias. Unfortunately, we cannot estimate the effects of different EPA modalities in this framework, because these are perfectly collinear with the treatment effect (i.e., the existence of an EPA). Second, to further address the potential reverse causality, we instrument EPA budgets with the number of years since the agency was created. It is not clear how the longevity of an EPA affects its budget. On the one hand, experienced EPAs could have larger budgets as they become rooted in the government's institutional structure, and its staff become more knowledgeable and influential in budgetary decisionmaking. On the other hand, one of the critiques of the previous generation of EPAs is that they were not adequately funded, and there may be some hysteresis in the corresponding budgets. As discussed in the next section, it turns out that the older the EPA, the larger is its budget. Moreover, the number of years since the creation of the EPA does not seem to be a statistically significant determinant of exports per capita, which suggests that the number of years is a valid instrument for EPA's budget per capita in the export equation.

The basic export equation to be estimated is then:

$$\begin{aligned} \ln(\text{Exp}/\text{pop})_c &= \beta_0 + \beta_1 \ln(\text{Bud}/\text{pop})_c + \beta_2 \ln(\text{GDP}/\text{pop})_c + \beta_3 \ln(T)_c + \beta_4 \ln(MA)_c \\ &+ \beta_5 \ln(\text{Vol})_c + \beta_6 \ln \text{Reg}_c + \beta_7 \ln F\&R_c + \text{Dummies}_R + e_c \end{aligned} \quad (2)$$

where  $\beta$ s are parameters to be estimated.  $\text{Exp}/\text{pop}_c$  are exports per capita in country  $c$ , and  $\text{Bud}/\text{pop}_c$  is the budget of the EPA per capita in country  $c$ .  $\text{GDP}/\text{pop}_c$  is GDP per capita measured as the average for the period 2000-2004 in 2005 constant U.S. dollars from the World Bank's World Development Indicators.  $T_c$  is an index of trade restrictiveness imposed by country  $c$  on its imports from the rest of the world,  $MA_c$  is an index of market access restrictions imposed by the rest of the world on exports of country  $c$ , and both are borrowed from Kee, Nicita and Olarreaga (2006).  $\text{Vol}_c$  is the volatility of the exchange rate in country  $c$ , measured by the coefficient of variation of the dollar to local currency exchange rate during the period 2000-2004 obtained from the World Development Indicators.  $\text{Reg}_c$  is the number of days it takes to comply with export regulations and procedures from Djankov, Freund and Pham (2006).  $F\&R_c$  is the geography-determined trade to GDP ratio provided in Frankel and Romer (1999), which was estimated using a trade gravity framework where only geographic variables were used as explanatory variables of bilateral trade flows.<sup>12</sup>  $\text{Dummies}_R$  are regional dummies, and  $e_c$  is the standard white-noise error. When testing for what works and what doesn't in EPA modalities we add to (2) the variables discussed in section 3.

We estimate equations (1) and (2) using a full information maximum likelihood (FIML) estimator. The full information maximum likelihood (FIML) is generally more efficient than the two-step approach (LIML), especially in the presence of high levels of correlation between the explanatory variables of the selection and main equations (the two exclusion restrictions we imposed are aid per capita and the log of GDP).<sup>13</sup> We also provide OLS estimates, as

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<sup>12</sup>The idea is that EPAs cannot influence the geographic components of trade, such as geographic distance and common borders between trading partners, but their budget may be correlated with the geography-determined trade to GDP ratio as countries with larger trade flows might provide better funding to their EPAs.

<sup>13</sup>See Puhani (2000) for a survey of the literature. Note however that results of the two-step and the FIML approach were very similar.

it performs better than full and limited information maximum likelihood when the variables associated with the exclusion restrictions are also directly correlated with the outcome variable, as shown by Rendtel (1992) using Monte Carlo simulations.<sup>14</sup>

## 5 Results

The result from the estimation of (1) and (2) are shown in Table 1 for the whole sample and for developing countries using OLS and a Heckman correction. For the Heckman estimation we also report the selection equation. Across all specifications the EPA budget has a positive and statistically significant effect on exports. In the sub-sample of developing countries the effect is slightly smaller, although the difference is not statistically significant. Note also that the selection parameter  $\lambda$  is not statistically different from zero in the full sample but it is positive and statistically significant in the developing country sub-sample, which suggests that sample selection is not really an issue in the full sample, but it may be a problem when working with developing countries only. This is also confirmed by the fact that OLS estimates are quite close to Heckman estimates in the full sample, but there are some larger differences for the developing country sub-sample.<sup>15</sup>

A quick back-of-the-envelope calculation suggests that the effect calculated at the median value both in the full sample and in the sub-sample of developing countries, of an additional \$1 of EPA budget generates around \$200 of additional exports. This seems large, but the elasticity at the median of the sample explains only 8 percent of the median country exports. This is within the range of estimates by Rose (2007) discussed earlier, which suggest that the presence of a consulate or embassy engaged on export promotion leads to a 6 to 10 percent increase in exports. Also, this is not a welfare calculation, and such “returns” may be consistent with a welfare loss associated with EPA’s activities, as discussed earlier. Nevertheless

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<sup>14</sup>Admittedly, economic size and aid per capita may directly affect exports per capita. However, empirically, aid per capita was not significant after controlling for the presence of EPAs. This suggests that it is a valid instrumental variable.

<sup>15</sup>An alternative explanation is that there is selection, but that our correction has not done an adequate job. However, the fact that several of the variables in the selection equation are significant, and in particular log of aid per capita and log of GDP (which are our exclusion restrictions) suggests that this is not the case.

they are encouraging numbers, when measured in terms of export returns. However, the estimated elasticities of about 0.10 suggest that there are strong diminishing returns to scale. Consequently, large expansions of EPAs budgets may not be desirable.<sup>16</sup>

Regarding the other explanatory variables in the regression in Table 1, GDP per capita ( $\ln GDP/pop$ ) has a positive and statistically significant sign in all specifications suggesting that richer countries, with stronger and better institutions –including trade institutions– export more. The restrictiveness of the exporting country import regime ( $\ln T$ ) does not seem to affect export performance, suggesting that general equilibrium effects are not a strong determinant of exports.<sup>17</sup> In contrast, the restrictiveness faced by exporters ( $\ln MA$ ) in the rest of the world strongly reduces exports across all specifications with a slightly higher coefficient for developing countries when correcting for sample selection bias. Exchange rate volatility ( $\ln Vol$ ) also has a negative impact on exports, although it is statistically significant only in the case of the full sample after correcting for sample bias.<sup>18</sup> The number of days necessary to comply with export regulation in the exporting country has a negative, but generally insignificant impact on exports. The geography component of the trade to GDP ratio as provided in Frankel and Romer (1999) is always positive and statistically significant.<sup>19</sup>

As discussed in the previous section, the results in Table 1 might suffer from reverse causality, as countries that export more might be more likely to establish EPAs, and from

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<sup>16</sup>The next subsection discusses a break point (around \$1 per capita of EPA expenditures) above which the marginal returns become negative.

<sup>17</sup>This result also suggests that in the early 2000s contrary to what was observed by Keesing and Singer (1991a) in the 1980s, the main constraint to exports is no longer the anti-trade bias of the import regime.

<sup>18</sup>The lack of a significant effect of nominal exchange-rate volatility on exports is consistent with recent result reported by Teneyro (2007). This author shows that estimates of the effect of volatility on exports are quite fragile in the context of the gravity model of trade. The intuitive argument is that on the one hand, volatility reduces trade as it might act as friction against international transactions (i.e., by raising the costs of trade). On the other hand, exchange-rate fluctuations can offer profit opportunities for traders. Hence the net effect might be ambiguous. Also, the existence of financial instruments that help agents protect themselves against risk would also support the view that volatility might not have significant deleterious effects on international trade flows.

<sup>19</sup>In both selection equations, size and aid per capita –which are our exclusion restrictions– have a positive and statistically significant, except for aid per capita in the developing country sub-sample where the coefficient has a p-value of 0.130. Thus, larger countries receiving large amounts of aid were more likely to be in our sample. This reflects in part, our capacity to identify the relevant agency in the country (as we were helped by World Bank’s country economists), but also the agencies capacity to answer the survey.

the potential correlation of EPA’s budget with omitted variables in the export equation. To address these concerns, the first column of Table 2 provides a treatment effect estimate, where the treatment is the presence of an export promotion agency, which is instrumented with log of aid per capita.<sup>20</sup> The coefficient is positive and statistically significant suggesting that the presence of EPA helps; all the other coefficients are qualitatively similar to the ones reported in Table 1. Note, however, that the negative coefficient on exchange rate volatility becomes statistically significant in the treatment regression. Results for the presence of the EPA in the treatment regression –not reported– suggest that presence of an EPA is well explained by aid per capita, which has a positive and statistically significant coefficient, as well as the volatility of the exchange rate and the geography-determined trade to GDP ratio which both make the presence of an EPA less likely. The regulation burden on exporters makes the presence of an EPA more likely, and EPAs are more likely to be found in the OECD and less likely to be found in SSA.<sup>21</sup> Results for the developing country sub-sample are very similar (coefficients are within one standard deviations of the ones reported for the full sample in Table 2) and are available upon request.

We also provide two stage least squares (2SLS) estimates of the export equation, where EPA’s budget per capita is instrumented using the number of years since the agency was created. As shown in the Auxiliary Regressions appendix, older EPAs tend to have larger budgets. Moreover, the number of years since the EPA was created is not a statistically significant determinant of exports per capita. The second column in Table 2 provides a 2SLS estimation of the export equation for the full sample, and without correcting for sample bias. Columns three and four in Table 2 provide the 2SLS maximum likelihood Heckman estimates where EPA’s budget is instrumented using the number of years since the agency was created, for the full sample and for the sub-sample of developing countries.

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<sup>20</sup>We also control for sample selection bias using a 2-step Heckman correction using the log of GDP and log of aid per capita as the exclusion restrictions. Note that there is still a need to correct for sample bias in this treatment regression, as for some countries (observations) we do not know whether there is an EPA in place or not.

<sup>21</sup>Note that the coefficient on the  $\lambda$  (Mills ratio) is statistically significant suggesting that sample bias was a problem.

The interesting result from these 2SLS regressions is that the coefficient on EPA’s budget declines considerably relative to those estimated in Table 1. One potential explanation for this is that countries that export large amounts tend to have larger EPA’s budget.<sup>22</sup> Nevertheless, coefficients are still positive and statistically different from zero across all specifications. A quick back-of-the-envelope calculation suggests that the effect calculated at the median value of an additional \$1 of EPA budget generates around \$40 of additional exports in the full sample and \$60 in the sub-sample of developing countries. Again, EPA budgets are small relative to exports, and the median budget explains only 1.7 percent of median exports.<sup>23</sup> Indeed, the estimated elasticities of 0.02-0.03 imply severely diminishing returns to scale.

Regarding the control variables, the log of GDP per capita, the log of trade restrictiveness in the rest of the world, and the log of geography-determined trade to GDP ratio are the most robust determinants of exports per capita across specifications. Exchange-rate volatility always has a negative sign, but it is never statistically different from zero.<sup>24</sup>

## 5.1 Heterogeneity across regions and levels of income

We also explored the heterogeneity of the effect of export promotion budgets across regions and levels of income by allowing the coefficient to vary by regions (EEA, LAC, MENA, OECD and SSA) in the first two columns of Table 3 and by level of income (GDP per capita) in the last two columns of Table 3. Estimates using 2SLS with and without a maximum likelihood Heckman correction are presented. But note that the estimates with and without sample

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<sup>22</sup>Note that only a handful of countries in our sample report explicitly taxing exports to finance EPA’s budget, but other mechanisms, such as political economy considerations, can explain this.

<sup>23</sup>This is significantly below the 6 to 10 percent estimate that Rose (2006) attributes to the export promotion role played by embassies and consulates. One explanation of these differences is that there is a larger number of developing countries in our sample than in Rose’s article. Also, as discussed in the final sub-section, the presence of foreign offices seem to have a negative effect on exports in developing countries.

<sup>24</sup>The endogeneity issue could further be tackled with a difference-in-differences estimator, but this requires panel data. There are three problems with this. First, agencies may change names without much deeper changes and we will have a late starting date for the agency, while it has existed for a long time. Second, the agencies in the 1980s are apparently a very different animal from the agencies today, and different agencies have reformed at different times. A difference-in-difference approach will not capture that. Finally, some of our explanatory variables are only available for the early 1990s. This is the case of the trade restrictiveness index and the market access trade restrictiveness index.

correction are not very different from each other, which is also signalled by a statistically insignificant coefficient on the Mills ratio.

In terms of region heterogeneity, EEA, LAC, and SSA are the regions where the export promotion budgets seem to have the strongest impact on exports, which are also statistically different from zero. For the OECD and MENA the coefficients are not statistically different from zero. Note also that although EEA has the largest point estimate its coefficient is not statistically different from the one obtained for SSA. Thus, although there is some interesting heterogeneity across regions, we do not seem to be able to estimate it very precisely. All the other coefficients show a similar pattern to the one observed in Tables 1 and 2.

One could use the Heckman estimates to compare the “return” for each \$ invested on export promotion across regions. A quick back-of-the-envelope calculation suggests that for each \$1 invested on export promotion there are \$100 of additional exports in EEA, \$70 in LAC, \$38 in SSA, \$5 in the OECD, and \$53 less exports in MENA. But it is important to recall that the estimates for the OECD and MENA are not statistically different from zero, and the estimates for the other three regions are not statistically different from each other.

Columns three and four of Table 3 presents the results regarding the heterogeneity of the impact of EPA’s budget across levels of development, with and without sample bias correction. Again, there is no much difference between the estimates of columns three and four, suggesting that this is not an issue in the full sample. The estimates suggest that at low levels of development the effect of EPA expenditures on exports may be negative, but this rapidly increases with the level of income.

However, the effect of the level of development on the estimated efficacy of EPA expenditures might be capturing underlying correlations among the level of development, the size of EPA budgets, and the marginal returns to EPA expenditures. As can be seen in the top quadrant of Figure 11 –where we plotted the predicted effect of EPA’s budget on log of exports per capita from the Heckman estimations against the size of the EPA budget– there is an inverted U-shape relationship between the effect of EPA budgets on the log of exports per capita and the size of EPA budgets per capita. This suggests –everything else equal– that at

very low or high levels of EPA budgets, returns may be smaller than at intermediate levels. That is, beyond a certain level of EPA budgets, around \$1 per capita, the marginal returns of EPA budgets are negative. Thus, at very low budgets, a budget increase is likely to increase the efficacy of the EPA, but at larger budgets increases may be counterproductive. Figure 11 also shows the correlation between income per capita and EPA budgets in the middle right quadrant. Unsurprisingly, richer countries have bigger budgets. Furthermore, the bottom right quadrant suggests that the correlation of GDP per capita with log of exports per capita monotonically increases with income per capita. That is –everything else equal– richer countries (with better institutions) tend to have more effective EPAs. Thus small budgets may be sufficient in rich countries, but may not provide an efficient tool to promote exports in poor countries (as argued by Keesing and Singer among others).

## 5.2 What works, what doesn't?

To explore the type of institutional structures, strategies, and activities that are more efficient we added to our basic specification in (2) some of the variables discussed in section 3. Results using a 2SLS maximum likelihood Heckman estimator –where the log of EPA's budget per capita is instrumented using the number of years since the EPA was created– are presented in Table 4 for the full sample, as well as the sub-sample of developing countries.

The top of the table shows the estimates for the variables in (2), which are qualitatively similar to the ones in Tables 1 and 2. EPA's budget per capita, GDP per capita, and the geography-determined trade to GDP ratios have a positive and statistically significant effect on exports per capita in both samples. The trade restrictiveness of the rest of the world faced by exporters and the volatility of the exchange rate have a negative and statistically significant effect on exports per capita in both samples. The burden of export regulations is negative and significant in the full sample, but not in the sub-sample of developing countries.

Regarding the selection equation, trade restrictions at home and exchange-rate volatility reduce the probability of observing an EPA. Interestingly, trade restrictions imposed by the rest of the world are positively correlated with the existence of an EPA in the full sample, but

they are negatively correlated in the sub-sample of developing countries. Hence developing countries that restrict their trade and face market access barriers abroad, and thus have relatively large anti-export biases at home, are unlikely to have an EPA.

More importantly, the two exclusion restrictions in the selection equation (log of aid per capita and log of GDP) are, as before, positive and statistically significant.<sup>25</sup> Also, the Mills ratio ( $\lambda$ ) is statistically significant in both samples suggesting that sample selection bias needed to be addressed in both samples. This contrasts with earlier results for the full sample reported in Tables 1 to 3, but note that because of the inclusion of the new additional variables we lost a significant number of observations (not all agencies answered all questions). In Table 4 we only have 51 uncensored observations in the full sample compared to 78 in Tables 1 to 3 which explains why sample selection bias became an issue in the full sample.

The bottom of the table reports estimates for the additional variables capturing EPA modalities. In both regressions, exports increase with the share of the EPA executive board seats that are held by the private sector. But exports also increase with the share of EPA funding coming from the public sector. This suggests that agencies that are directed by the private sector, but have public funding are the best performers. After all, the rationale for export promotion is about externalities, and it may be difficult to raise private sector funding when benefits are diffuse.

The proliferation of agencies dedicated to export promotion within a country (“Degree of decentralization of agencies”) hurts exports. A single and strong EPA seems to be the most effective.<sup>26</sup> Note, however, that the coefficient is not statistically significant in the sub-sample of developing countries.

Exports are also higher when the strategy of the agency is to focus on non-traditional exports or has some sector specific component, rather than just focus on overall exports. Note, however, that by sector focus we mean broad aggregates (agriculture, manufacturing, services, tourism, etc...), rather than specific products. Also, this effect is not statistically

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<sup>25</sup>And log of aid per capita is not a statistically significant determinant of exports per capita.

<sup>26</sup>This is a discrete variable that takes the value 1 if there is only one EPA in the country, 2 if there is one large, but many small agencies, 3 if there are two mayor agencies and several small, and 4 if there are more than two large agencies and several small agencies.

different from zero for the sub-sample of developing countries.

The allocation of expenditures between country image, export support services, marketing and market research does not seem to matter in the sub-sample of developing countries. However, in the full sample, exports fall with the share of the budget spent on research and increases with the share of the budget spent on export support services (although the latter effect is not statistically significant). This provides weak evidence that on-shore activities may be more productive than off-shore activities.

Exports increase with the share of the budget spent on large clients and declines with the share of the budget spent on established exporters, which suggest the focus should be on large firms (which have the potential to export), but are not yet exporting. This holds both for the full sample, and the sub-sample of developing countries.

The more interesting differences between the full sample and the sub-sample of developing countries concerns the use of EPA's office representations abroad. They have a positive and statistically significant effect in the full sample, but a negative and statistically significant impact in the sub-sample of developing countries. Thus the evidence provides little support for funding foreign offices by EPAs in developing countries, and suggests that there may be lessons to be drawn from the use of foreign offices by developed country EPAs.

## 6 Concluding Remarks

In their influential study of export promotion agencies in the 1980s, Hogan, Keesing, and Singer (1991) argued that EPAs in developing countries were not effective because they lacked strong leadership, had inadequate funding, were too bureaucratic, and not client oriented, with heavy government involvement. Moreover, they also had to overcome strong anti-trade biases to be effective.

Over the last decade, the structure and activities of EPAs changed in the direction suggested by Hogan, Keesing and Singer, and under the auspices of the International Trade Center in Geneva. Also, trade policies became more export-oriented. Our estimates suggest

that today's EPAs are effective in terms of having an impact on national exports. For every \$1 in the EPA budget there is an additional \$100 dollars of exports in EEA, \$70 in LAC, \$38 in SSA, \$5 in the OECD and -\$53 in MENA, although the last two estimates are not statistically different from zero. On average, exports increase with EPAs' budgets, even though our estimates suggest that at levels around \$1 per capita the marginal efficiency may become negative.

In terms of what works and what doesn't, our estimates suggest that EPAs should have a large share of the executive board in the hands of the private sector, but they should also have a large share of public sector funding. In other words, a full privatization of EPAs does not seem to work. A single and strong EPA should be preferred to the sometimes observed proliferation of agencies within countries. Results also suggest that EPAs should focus on non-traditional exports or have some broad sector orientation, rather than attempt to promote overall exports. They should also focus on large firms that are not yet exporters, rather than on small firms and established exporters. Also EPA offices abroad have a positive effect on exports in the full sample, but a negative impact in the sub-sample for developing countries, suggesting that agencies in developing countries are better off focusing on on-shore activities, and have probably something to learn from the experience of developed countries with EPA's office representations abroad.

Last but not least, words of caution are warranted. First, regarding the methodology used to derive these conclusions, cross-country regressions cannot fully capture the heterogeneity of policy environments and institutional structures in which agencies operate, without running out of degrees of freedom. To complement our study and provide adequate policy advice, case studies are needed. Second, the large average "returns" to EPA expenditures do not provide a justification for those budgets on welfare grounds, as these will need some measurement of the externalities and net benefits associated with export promotion. Moreover, larger returns may be obtained by investing those resources in improving the overall business climate (infrastructure, education, etc.), and we do not provide such an analysis. The analyses discussed in this paper do provide guidelines in terms of institutional design, objectives and activities of

EPAs that help maximize the impact of EPAs on exports. Finally, the evidence of diminishing returns to scale in EPA budgets, and negative marginal returns above certain levels, suggests that small (but not tiny) is beautiful when it comes to EPAs.

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Table 1: EPA's budget: Does it Help?

	All countries		Developing countries	
	OLS	Heckman Export Eq. Selection	OLS	Heckman Export eq. Selection <sup>e</sup>
Log of Budget per capita ( <i>ln Bud/pop</i> ) <sup>a</sup>	0.106** (0.021)	0.105** (0.019)	0.100** (0.021)	0.077** (0.030)
Log of GDP per capita ( <i>ln GDP/pop</i> )	0.693 ** (0.203)	0.701 ** (0.174)	0.547** (0.127)	0.576** (0.118)
Log of Trade restrictiveness ( <i>ln T</i> )	0.062 (0.188)	-0.040 (0.178)	0.115 (0.206)	-0.137 (0.297)
Log of Trade restrictiveness in ROW ( <i>ln MA</i> )	-1.357** (0.415)	-1.537** (0.422)	-2.174** (0.359)	-1.443** (0.327)
Log of Forex volatility ( <i>ln Vol</i> )	-0.144 (0.115)	-0.162* (0.093)	-0.155 (0.117)	-0.361 (0.244)
Days to comply with export regulation ( <i>ln Reg</i> )	-0.008* (0.004)	-0.005 (0.005)	-0.006 (0.007)	-0.004 (0.009)
Log of geo-trade/GDP ratio ( <i>ln F&amp;R</i> )	0.583** (0.201)	0.570** (0.167)	0.732** (0.216)	0.592** (0.253)
Log of GDP ( <i>ln GDP</i> )				0.496 ** (0.204)
Log of Aid per capita ( <i>ln Aidc</i> )				0.691 (0.462)
Constant	-3.620** (0.762)	-4.617** (0.709)	-4.764** (1.44)	-5.956 ** (0.958)
Regional dummies <sup>b</sup>	Yes	Yes	Yes	Yes
<i>P</i> – value of F or Chi-squared Wald-test. <sup>c</sup>	0.000	0.000	0.000	0.000
Number of observations	78	144	63	120
Number of uncensored	78	77	63	62
R-squared	0.958		0.949	
$\lambda$ <sup>d</sup>	NA	0.167 (0.24)	NA	0.492** (0.186)

<sup>a</sup> Standard errors are in parenthesis and corrected non-parametrically for clustering within region. \*\* stands for significance at the 5 percent level; and \* stands for significance at the 10 percent level.

<sup>b</sup> The regional dummies are LAC, OECD, EEA, MENA, and SSA.

<sup>c</sup> In the case of OLS regressions we report the F-test and in the case of Full or limited information maximum likelihood we report the Wald test on the joint significance of all coefficients.

<sup>d</sup> The selection parameter  $\lambda$  (Mills ratio) captures the extent to which selection is a problem in the sample. When statistically different from zero, this suggest that there is a sample bias that needed to be corrected.

**Table 2: Reverse causality?<sup>a</sup>**

	Treatment 2-step Heckman All countries	2SLS No Heckman All countries	2SLS ML Heckman All countries	2SLS ML Heckman Developing countries
Log of Budget per capita ( $\ln Bud/pop$ ) <sup>b</sup>		0.0196** ( 0.006 )	0.0195** ( 0.006 )	0.031** ( 0.009 )
Log of GDP per capita ( $\ln GDP/pop$ )	0.741 ** ( 0.249 )	0.819 ** ( 0.198 )	0.828 ** ( 0.184 )	0.768 ** ( 0.147 )
Log of Trade restrictiveness ( $\ln T$ )	-0.200 ( 0.181 )	0.051 ( 0.175 )	-0.009 ( 0.5218 )	-0.038 ( 0.193 )
Log of Trade restrictiveness in ROW ( $\ln MA$ )	-2.116 ** ( 0.720 )	-1.188 ** ( 0.423 )	-1.270 ( 0.798 )	-2.096 ** ( 0.122 )
Log of Forex volatility ( $\ln Vol$ )	-0.219** ( 0.069 )	-0.124 ( 0.167 )	-0.135 ( 0.411 )	-0.316 ( 0.356 )
Days to comply with export regulation ( $\ln Reg$ )	-0.007 ( 0.009 )	-0.010** ( 0.003 )	-0.009* ( 0.005 )	0.004 ( 0.009 )
Log of geo-trade/GDP ratio ( $\ln F\&R$ )	0.627** ( 0.181 )	0.627** ( 0.209 )	0.618** ( 0.217 )	0.726** ( 0.228 )
Treatment (Dummy=1 if EPA exists)	1.096** ( 0.105 )			
Constant	-8.063** ( 0.718 )	-4.426*** ( 0.631 )	-4.923 ( 3.521 )	-7.839** ( 1.431 )
Regional dummies <sup>c</sup>	Yes	Yes	Yes	Yes
<i>P</i> -value of Chi-squared Wald-test	0.000	0.000	0.000	0.000
Number of observations	142	78	144	120
Number of uncensored	99		77	62
R-squared	NA	0.955	NA	NA
$\lambda$ <sup>d</sup>	0.899** ( 0.265 )	NA	0.140 ( 1.514 )	0.502** ( 0.092 )

<sup>a</sup>All regressions used a 2SLS estimator, except the treatment regression where the treatment is estimated using maximum likelihood. Estimates for the first stage regression are provided in the Auxiliary Regressions Appendix. In the case of the treatment regression we also correct for sample selection bias, using a two step approach.

<sup>b</sup>Standard errors are in parenthesis and corrected non-parametrically for clustering within region. \*\* stands for significance at the 5 percent level; and \* stands for significance at the 10 percent level.

<sup>c</sup>The regional dummies are LAC, OECD, EEA, MENA, and SSA.

<sup>d</sup>The selection parameter  $\lambda$  (Mills ratio) captures the extent to which selection is a problem in the sample. When statistically different from zero, this suggest that there is a sample bias that needed to be corrected.

**Table 3: Heterogeneity of the impact of EPAs' budget on exports**

	By region-2SLS		By level of income-2SLS	
	No Heckman	FIML Heckman	No Heckman	FIML Heckman
Log of Budget per capita ( $\ln Bud/pop$ ) <sup>a</sup>			-0.376** ( 0.086 )	-0.355** ( 0.040 )
Log of Budget per capita in LAC ( $\ln Bud/pop$ *LAC dummy)	0.033** ( 0.009 )	0.029* ( 0.018 )		
Log of Budget per capita in OECD ( $\ln Bud/pop$ *OECD dummy)	0.004 ( 0.033 )	0.004 ( 0.028 )		
Log of Budget per capita in Asia ( $\ln Bud/pop$ *EEA dummy)	0.053** ( 0.016 )	0.053** ( 0.016 )		
Log of Budget per capita in MENA ( $\ln Bud/pop$ *MENA dummy)	-0.004 ( 0.015 )	0.003 ( 0.018 )		
Log of Budget per capita in SSA ( $\ln Bud/pop$ *SSA dummy)	0.022** ( 0.005 )	0.024** ( 0.012 )		
Log of GDP per capita ( $\ln GDP/pop$ )	0.820** ( 0.187 )	0.826** ( 0.170 )	0.978** ( 0.168 )	0.975** ( 0.156 )
Log of Trade restrictiveness ( $\ln T$ )	0.032 ( 0.187 )	-0.002 ( 0.300 )	0.138 ( 0.158 )	0.109 ( 0.179 )
Log of Trade restrictiveness in ROW ( $\ln MA$ )	-1.175** ( 0.462 )	-1.249** ( 0.510 )	-1.580** ( 0.432 )	-1.607** ( 0.415 )
Log of Forex volatility ( $\ln Vol$ )	-0.124 ( 0.206 )	-0.139 ( 0.325 )	-0.110 ( 0.157 )	-0.113 ( 0.189 )
Days to comply with export regulation ( $\ln Reg$ )	-0.010** ( 0.003 )	-0.009** ( 0.002 )	0.001 ( 0.002 )	0.001 ( 0.002 )
Log of geo-trade/GDP ratio ( $\ln F\&R$ )	0.636** ( 0.196 )	0.631** ( 0.175 )	0.652** ( 0.167 )	0.646** ( 0.151 )
Interaction Budget and Income ( $\ln Bud/pop$ )* ( $\ln GDP/pop$ )			0.046** ( 0.009 )	0.043** ( 0.004 )
Interaction Budget and Income squared ( $\ln Bud/pop * \ln GDP/pop$ ) <sup>2</sup>			-0.0002** ( 0.0001 )	-0.0002** ( 0.0001 )
Constant	-4.466** ( 0.696 )	-5.323** ( 1.115 )	-7.122** ( 0.198 )	-7.261 *** ( 0.707 )
Regional dummies <sup>b</sup>	Yes	Yes	Yes	Yes
<i>P</i> – value of F or Chi-squared Wald-test. <sup>c</sup>	0.000	0.000	0.000	0.000
Number of observations	78	144	78	144
Number of uncensored	78	77	78	77
R-squared	0.956	NA	0.959	NA
$\lambda$ <sup>d</sup>	NA	0.121 ( 0.783 )	NA	0.082 ( 0.338 )

<sup>a</sup>Standard errors are in parenthesis and corrected non-parametrically for clustering within region. \*\* stands for significance at the 5 percent level; and \* stands for significance at the 10 percent level.

<sup>b</sup>The regional dummies are LAC, OECD, EEA, MENA, and SSA.

<sup>c</sup>For OLS estimates we report the F-test and for Heckman estimates we report the Wald test on the joint significance of all coefficients.

<sup>d</sup>The selection parameter  $\lambda$  (Mills ratio) captures the extent to which selection is a problem in the sample. When statistically different from zero, this suggest that there is a sample bias that needed to be corrected.

**Table 4: EPAs: what works, what doesn't?<sup>a</sup>**

	All countries		Developing Countries	
	Export eq.	Selection eq.	Export eq.	Selection eq.
Log of Budget per capita ( $\ln Bud/pop$ ) <sup>b</sup>	0.044** ( 0.017 )		0.046** ( 0.012 )	
Log of GDP per capita ( $\ln GDP/pop$ )	0.669** ( 0.153 )	-0.059 ( 0.290 )	0.510** ( 0.119 )	-0.011 ( 0.393 )
Log of Trade restrictiveness ( $\ln T$ )	-0.022 ( 0.141 )	-0.919** ( 0.252 )	0.155 ( 0.200 )	-0.434** ( 0.202 )
Log of Trade restrictiveness in ROW ( $\ln MA$ )	-1.839** ( 0.152 )	1.424** ( 0.595 )	-2.268** ( 0.176 )	-0.565** ( 0.252 )
Log of Forex volatility ( $\ln Vol$ )	-0.281** ( 0.113 )	-0.094** ( 0.042 )	-0.325** ( 0.100 )	-0.129** ( 0.058 )
Days to comply with export regulation ( $\ln Reg$ )	-0.018** ( 0.003 )	0.021 ( 0.023 )	-0.013 ( 0.008 )	0.014 ( 0.031 )
Log of geo-trade/GDP ratio ( $\ln F\&R$ )	0.360** ( 0.178 )	0.354 ( 0.256 )	0.698** ( 0.080 )	-0.269 ( 0.285 )
Log of aid per capita ( $\ln Aidc$ )		0.537** ( 0.129 )		0.609** ( 0.147 )
Log of GDP ( $\ln GDP$ )		0.680** ( 0.139 )		0.250** ( 0.019 )
Executive Board seats to private sector	0.968** ( 0.172 )		0.571** ( 0.242 )	
Degree of decentralization of agencies devoted to exp. prom.	-0.215** ( 0.052 )		-0.029 ( 0.115 )	
Share of agency budget spent on non-export promotion activities	0.001 ( 0.044 )		0.062 ( 0.043 )	
Strategy focuses on non traditional exports or sector specific	0.159** ( 0.054 )		-0.024 ( 0.059 )	
Share of EPA funding coming from public sources	0.105* ( 0.056 )		0.119** ( 0.034 )	
Share of country image activities in EPA's expenditure	-0.044* ( 0.027 )		-0.012 ( 0.042 )	
Share of marketing activities in EPA's expenditure	-0.059 ( 0.039 )		-0.034 ( 0.045 )	
Share of research activities in EPA's expenditure	-0.152** ( 0.068 )		-0.031 ( 0.086 )	
Share of export support serv. in EPA's expenditure	0.005 ( 0.049 )		-0.047 ( 0.046 )	
Share of large clients in EPA expenditure	0.115* ( 0.066 )		0.098** ( 0.028 )	
Share of established exporters in EPA expenditure	-0.058** ( 0.016 )		-0.034 ( 0.035 )	
EPA has representation offices abroad	0.133* ( 0.082 )		-0.114** ( 0.053 )	
Constant	-4.771** ( 1.336 )	-8.204* ( 4.828 )	-5.763** ( 1.503 )	-10.497** ( 4.747 )
<i>P</i> -value of Chi-squared Wald-test	0.000	0.000	0.000	0.000
Number of observations	118	118	99	99
Number of uncensored $\lambda^c$	51 0.407** ( 0.105 )	51 0.407** ( 0.105 )	41 0.302** ( 0.066 )	41 0.302** ( 0.066 )

<sup>a</sup>These are 2SLS ML Heckman estimates, where the log of EPA's budget per capita is instrumented using the number of years since the EPA was created. Regional dummies included in all regressions.

<sup>b</sup>Standard errors are in parenthesis and corrected non-parametrically for clustering within region. \*\* stands for significance at the 5 percent level; and \* stands for significance at the 10 percent level.

<sup>c</sup>The selection parameter  $\lambda$  (Mills ratio) captures the extent to which selection is a problem in the sample. When statistically different from zero, this suggest that there is a sample bias that needed to be corrected.

## Appendix Table: Sample Coverage

Country	Name of the Agency	Region
Albania	ANE	EEA
Algeria	ALGEX	MENA
Armenia	ADA	EEA
Australia	Austrade	OECD
Austria	Austrian Trade, Austrian Federal Economic Chamber	OECD
Bangladesh	EPB	EEA
Belize	Belize Trade & Investment Development Service	LAC
Bolivia	CEPROBOL	LAC
Botswana	BEDIA	SSA
Brazil	APEX-Brasil	LAC
Bulgaria	BSMEPA	EEA
Burkina Faso	ONAC	SSA
Cambodia	Export Promotion Department, Ministry of Commerce	EEA
Chile	PROCHILE	LAC
China	CCPIT	EEA
Colombia	ProExport	LAC
Costa Rica	Procomer	LAC
Cote d'Ivoire	APEX-CI	SSA
Czech Republic	Czech Trade	EEA
Denmark	Trade Council of Denmark	OECD
Dominica	DEXIA	LAC
Dominican Republic	CEI-RD	LAC
Ecuador	CORPEI	LAC
Egypt, Arab Rep.	ExpoLink	MENA
El Salvador	Exporta El Salvador	LAC
Estonia	Enterprise Estonia	EEA
Fiji	FTIB	EEA
Finland	Finpro	OECD
France	UBIFRANCE	OECD
Germany	BFAI	OECD
Ghana	GEPC	SSA
Grenada	Trade & Industry Unit, Ministry of Finance	LAC
Guatemala	AGEXPRONT	LAC
Guyana	GO-INVEST	SSA
Honduras	FIDE	LAC
Hong Kong, China	HKTDC	EEA
Hungary	Hungarian Investment and Trade Development Agency	EEA
Iceland	Trade Council of Iceland	OECD
Ireland	Enterprise Ireland	OECD
Israel	Israel Export & International Cooperation Institute	MENA
Jamaica	JAMPRO	LAC
Jordan	JEDCO	MENA
Kenya	Export Promotion Council	SSA
Latvia	LIDA	EEA
Lebanon	IDAL	MENA
Lesotho	Trade Promotion Unit	SSA
Lithuania	LDA	EEA
Malawi	MEPC	SSA
Malaysia	MATRADE	EEA
Malta	Malta Enterprise	MENA
Mauritius	Enterprise Mauritius	SSA
Mexico	Bancomext	LAC
Moldova	MEPO	EEA
Morocco	CMPE	MENA
Mozambique	IPEX	SSA
Netherlands	EVD	OECD
Nicaragua	APEN	LAC
Niger	ANIPEX	SSA
Norway	Innovation Norway	OECD
Panama	National Direction of Investment & Export Promotion	LAC
Paraguay	PROPARAGUAY	LAC
Peru	Prompex	LAC
Portugal	ICEP Portugal	OECD
Puerto Rico	Compania de Comercio y Exportacion	LAC
Rwanda	RIEPA	SSA
Senegal	ASEPEX	SSA
Serbia and Montenegro	SIEPA	EEA
Sierra Leone	SLEDIC	SSA
Slovak Republic	SARIO	EEA
Slovenia	TIPO	EEA
South Africa	TISA	SSA
Spain	ICEX	OECD
Sweden	Swedish Trade Council	OECD
Switzerland	OSEC Business Network Switzerland	OECD
Taiwan, China	TAITRA	EEA
Tanzania	Board of External Trade	SSA
Thailand	Department of Export Promotion	EEA
Trinidad and Tobago	TIDCO Limited	LAC
Tunisia	FAMEX	MENA
Turkey	IGEME	EEA
Uganda	Uganda Export Promotion Board	SSA
United Kingdom	UKTI	OECD
Uruguay	Uruguay XXI	LAC
Venezuela, RB	BANCOEX	LAC
Vietnam	Vietrade	EEA
West Bank and Gaza	Paltrade	MENA
Yemen, Rep.	Yemen Export Supreme Council	MENA
Zambia	EBZ	SSA

## Auxiliary Regressions

Table A reports first stage regressions of the 2SLS estimations with and without sample selection correction (i.e., with and without log of aid per capita and log of GDP per capita as instruments), and with and without the additional variables discussed in Table 4. In the first two columns reported in Table A, the number of years has a positive and statistically significant impact on EPA's budget per capita suggesting that older EPA's tend to have larger budgets. Log of aid per capita also has a statistically significant partial correlation with EPA budgets in the second column. Countries receiving more aid per capita tend to have large budgets per capita allocated to EPAs. In the third column, however, the log of number of years since the creation of the EPA appears as a weak instrument, with a much smaller coefficient which is not statistically different from zero. The log of aid per capita is still highly significant in this third specification.

Table B reports results of second stage regressions with and without sample correction, as well as with the additional variables discussed in Table 4. In two of the three specifications reported in Table B the log of the number of years since the creation of the EPA does not directly explain exports per capita as the coefficient is not statistically significant. In the second specification the number of years has a statistically significant coefficient at the 10 percent level. The log of aid per capita and log of GDP, which are used as the exclusion restrictions in the selection equation, appear as additional explanatory variables in the second and third columns. The log of GDP has a positive and statistically significant coefficient in both specifications, thus suggesting that it directly affects exports and therefore may not be an appropriate variable to use in the selection equation. However, log of aid per capita does not directly determine exports per capita, as its coefficient is statistically insignificant in both specifications, and, as seen in Table A, it is also an adequate instrument for EPA budgets as it has a statistically significant coefficient in those regressions.

**Table A: Instrumenting EPA's budget—1st stage regression<sup>a</sup>**

	Dependent variable: EPA's budget		
Log of number of years since creation of EPA <sup>b</sup>	3.352** ( 0.313 )	3.183** ( 0.545 )	0.077 ( 0.205 )
Log of GDP per capita (ln <i>GDP/pop</i> )	1.701* ( 0.926 )	1.623 ( 0.983 )	0.524* ( 0.242 )
Log of Trade restrictiveness (ln <i>T</i> )	-1.435 ( 1.084 )	-1.036 ( 0.986 )	0.087 ( 0.582 )
Log of Trade restrictiveness in ROW (ln <i>MA</i> )	-1.794 ( 1.997 )	3.072 ( 2.583 )	-0.549 ( 1.573 )
Log of Forex volatility (ln <i>Vol</i> )	-0.280 ( 0.249 )	-0.298** ( 0.113 )	-0.584** ( 0.149 )
Days to comply with export regulation (ln <i>Reg</i> )	-0.037 ( 0.060 )	-0.027 ( 0.108 )	-0.065** ( 0.015 )
Log of geo-trade/GDP ratio (ln F&R)	1.113 ( 0.724 )	1.668** ( 0.374 )	0.858 ( 0.781 )
Log of aid per capita (ln <i>Aidc</i> )		0.798** ( 0.181 )	0.481** ( 0.114 )
Log of GDP (ln ( <i>GDP</i> ))		0.799 ( 0.649 )	-0.211 ( 0.427 )
Executive Board seats to private sector			1.101 ( 0.960 )
Degree of decentralization of agencies devoted to exp. prom.			-0.643** ( 0.217 )
Share of agency budget spent on non-export promotion activities			0.317* ( 0.166 )
Strategy focuses on non traditional exports or sector specific			-0.314 ( 0.222 )
Share of EPA funding coming from public sources			-0.100 ( 0.162 )
Share of country image activities in EPA's expenditure			0.116 ( 0.229 )
Share of marketing activities in EPA's expenditure			-0.192 ( 0.117 )
Share of research activities in EPA's expenditure			-0.908** ( 0.192 )
Share of export support serv. in EPA's expenditure			
Share of large clients in EPA expenditure			0.036 ( 0.233 )
Share of established exporters in EPA expenditure			-0.146 ( 0.226 )
EPA has representation offices abroad			0.742 ( 0.479 )
Constant	-27.838** ( 9.712 )	-32.194 ( 26.936 )	-3.060 ( 8.849 )
<i>P</i> -value of F test	0.000	0.000	0.000
Number of observations	78	77	51
R-squared	0.694	0.738	0.886

<sup>a</sup>These are all OLS estimates. Regional dummies included in all regressions.

<sup>b</sup>Standard errors are in parenthesis and corrected non-parametrically for clustering within region. \*\* stands for significance at the 5 percent level; and \* stands for significance at the 10 percent level.

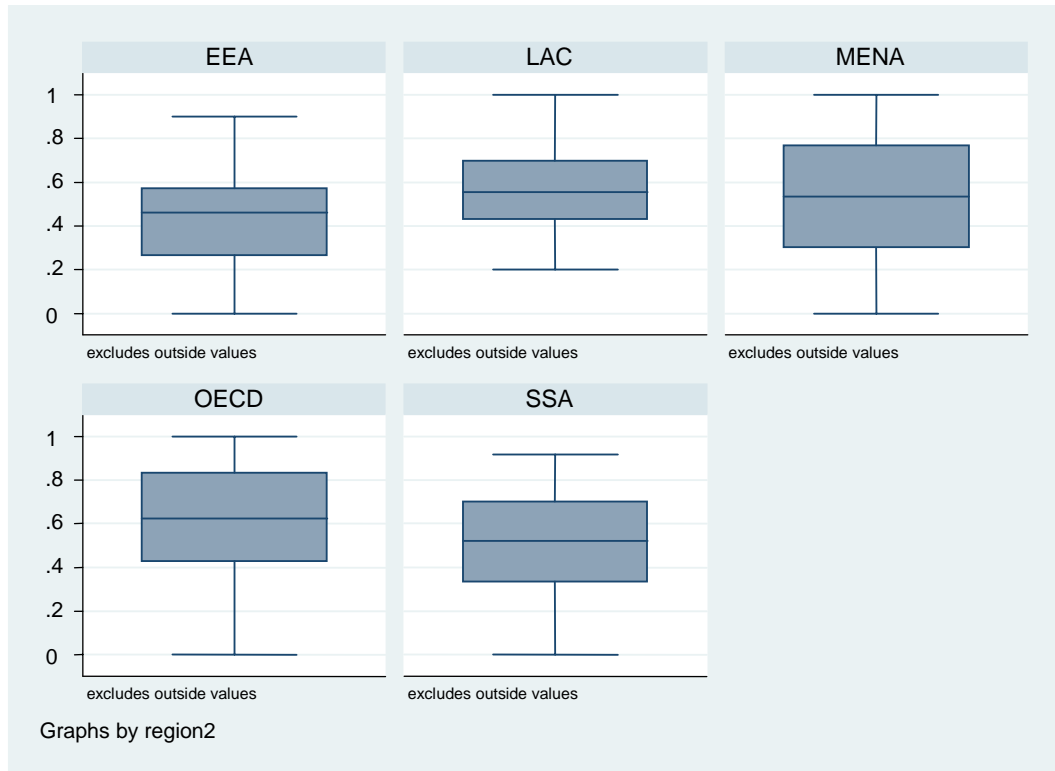
**Table B: Are instruments correlated with exports per capita?<sup>a</sup>**

	Dependent variable: Log of exports per capita		
Log of Budget per capita (ln <i>Bud/pop</i> ) <sup>b</sup>	0.110** ( 0.038 )	0.089** ( 0.033 )	0.050 ( 0.063 )
Log of GDP per capita (ln <i>GDP/pop</i> )	0.670** ( 0.136 )	0.821** ( 0.115 )	0.799** ( 0.164 )
Log of Trade restrictiveness (ln <i>T</i> )	0.031 ( 0.137 )	0.029 ( 0.119 )	-0.001 ( 0.163 )
Log of Trade restrictiveness in ROW (ln <i>MA</i> )	-1.340** ( 0.274 )	-2.582** ( 0.338 )	-0.549 ( 0.440 )
Log of Forex volatility (ln <i>Vol</i> )	-0.140 ( 0.139 )	-0.061 ( 0.115 )	-0.247 ( 0.170 )
Days to comply with export regulation (ln <i>Reg</i> )	-0.009 ( 0.007 )	-0.009 ( 0.006 )	-0.016 ( 0.011 )
Log of geo-trade/GDP ratio (ln <i>F&amp;R</i> )	0.598** ( 0.089 )	0.152** ( 0.108 )	0.019 ( 0.156 )
Log of number of years since EPA creation	0.076 ( 0.053 )	0.076* ( 0.044 )	0.111 ( 0.073 )
Log of aid per capita (ln <i>Aidc</i> )		-0.063 ( 0.054 )	-0.029 ( 0.081 )
Log of GDP (ln ( <i>GDP</i> ))		-0.343** ( 0.063 )	-0.292** ( 0.077 )
Executive Board seats to private sector			0.629** ( 0.251 )
Degree of decentralization of agencies devoted to exp. prom.			-0.201* ( 0.112 )
Share of agency budget spent on non-export promotion activities			-0.004 ( 0.063 )
Strategy focuses on non traditional exports or sector specific			0.078 ( 0.084 )
Share of EPA funding coming from public sources			-0.066 ( 0.044 )
Share of country image activities in EPA's expenditure			-0.028 ( 0.073 )
Share of marketing activities in EPA's expenditure			-0.009 ( 0.067 )
Share of research activities in EPA's expenditure			0.002 ( 0.106 )
Share of export support serv. in EPA's expenditure			
Share of large clients in EPA expenditure			-0.010 ( 0.076 )
Share of established exporters in EPA expenditure			-0.076* ( 0.045 )
EPA has representation offices abroad			0.129 ( 0.149 )
Constant	-3.898** ( 1.261 )	0.940 ( 1.476 )	0.692 ( 1.967 )
<i>P</i> -value of F test	0.000	0.000	0.000
Number of observations	78	77	51
R-squared	0.953	0.969	0.966

<sup>a</sup>These are all OLS estimates. Regional dummies included in all regressions.

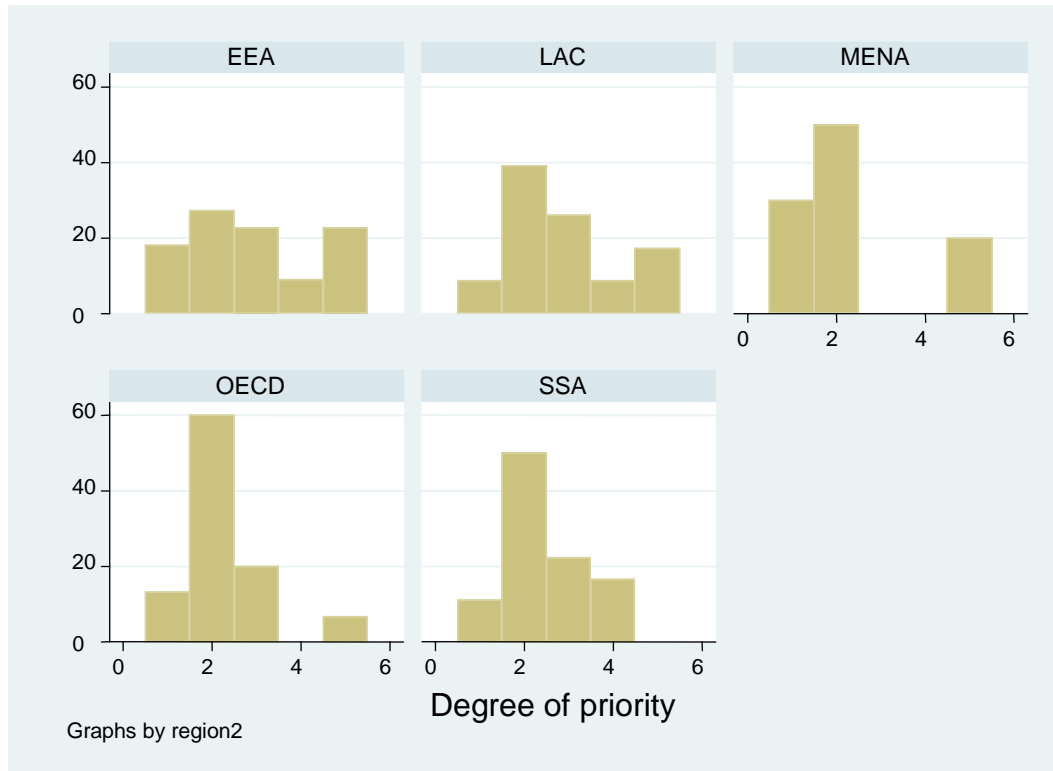
<sup>b</sup>Standard errors are in parenthesis and corrected non-parametrically for clustering within region. \*\* stands for significance at the 5 percent level; and \* stands for significance at the 10 percent level.

**Figure 1: Share of Executive Board seats granted to the private sector by region**



**Note:** The vertical axis shows the percentage of Executive Board seats in the hands of the private sector. Each box provides the bounds for the 25<sup>th</sup> and 75<sup>th</sup> percentile in each region, and the lines coming out of the box provide the adjacent value to the 25<sup>th</sup> and 75<sup>th</sup> percentiles in each region. The line within the box provides the median.

**Figure 2: Priority granted to export promotion within the agency by region**



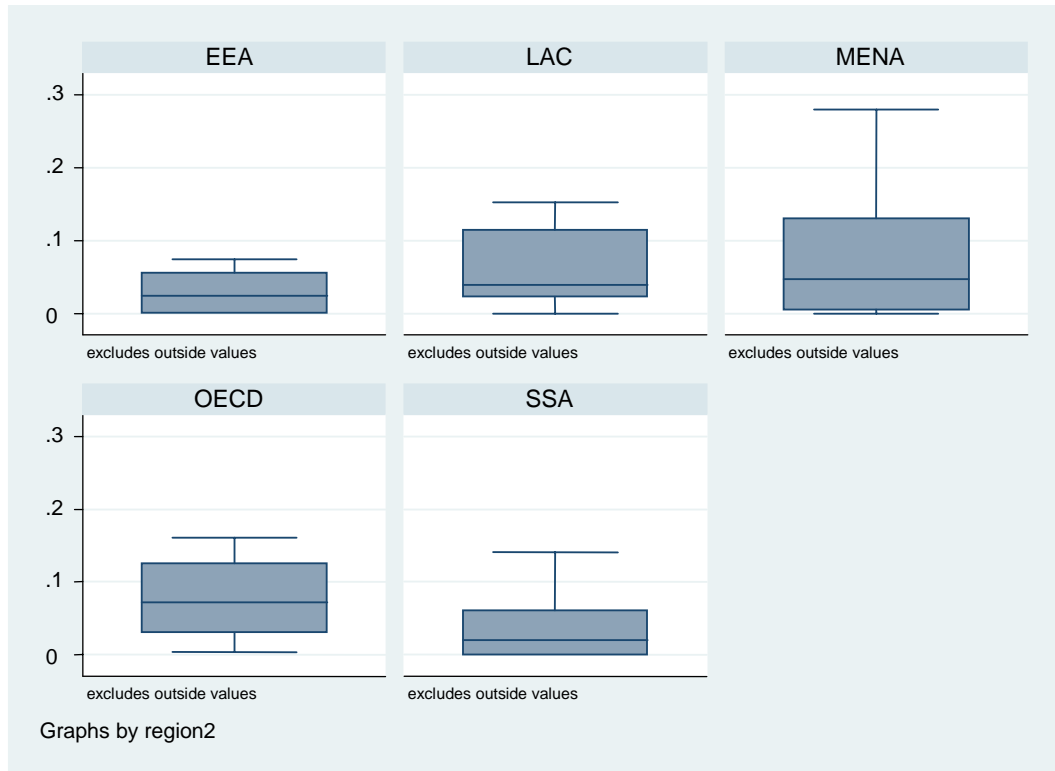
**Note:** The vertical axis shows the percentage of responses that correspond to each of the categories in the horizontal axis. A value of 1 in the horizontal axis means that export promotion is the only activity of the agency; a value of 2 means that it is its top priority; a value of 3 means that it is one of its top two priorities; a value of 4 means that it is one of its top 3 priorities and a value of 5 means that export promotion is a secondary activity of the agency.

**Figure 3: Strategy or goals of export promotion agencies by region**



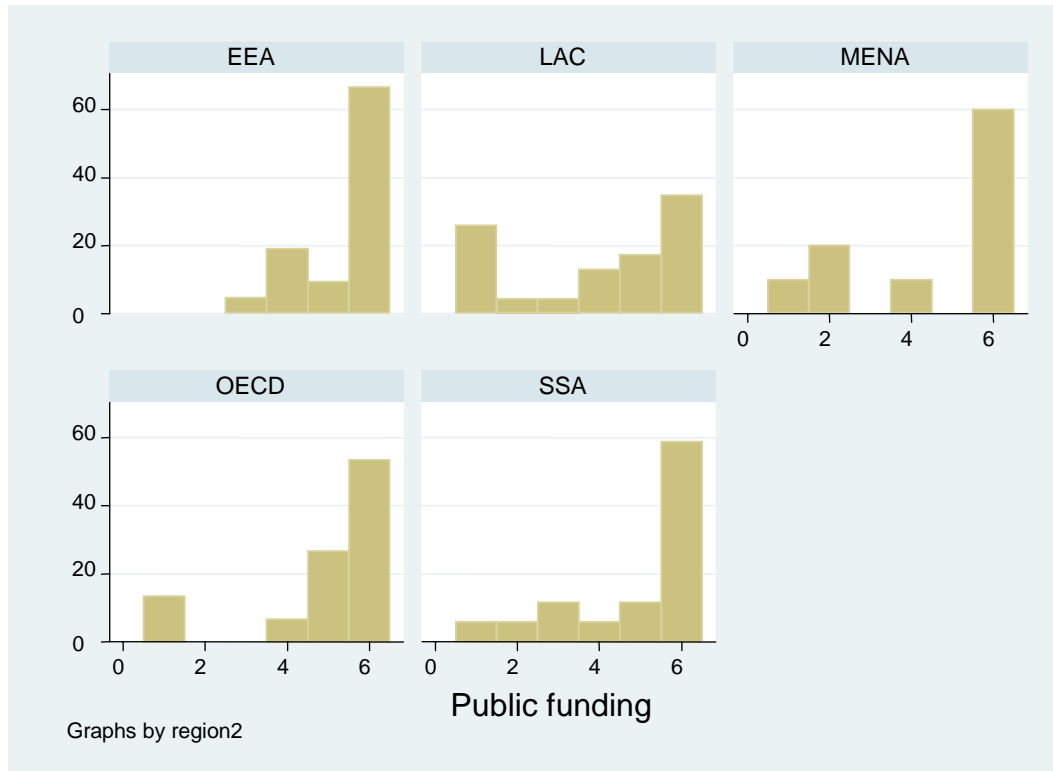
**Note:** The vertical axis shows the percentage of responses that correspond to each of the categories in the horizontal axis. A value of 1 in the horizontal axis indicates that the agency’s goal is to promote overall exports; a value of 2 indicates that the goal of the agency is to promote non traditional exports only; a value of 3 indicates that the agency aims at promotion specific sectors, and a value of 4 indicates that the agency aims at promotion industrial clusters and other objectives.

**Figure 4: Ratio of national export promotion agency budget to exports by region**



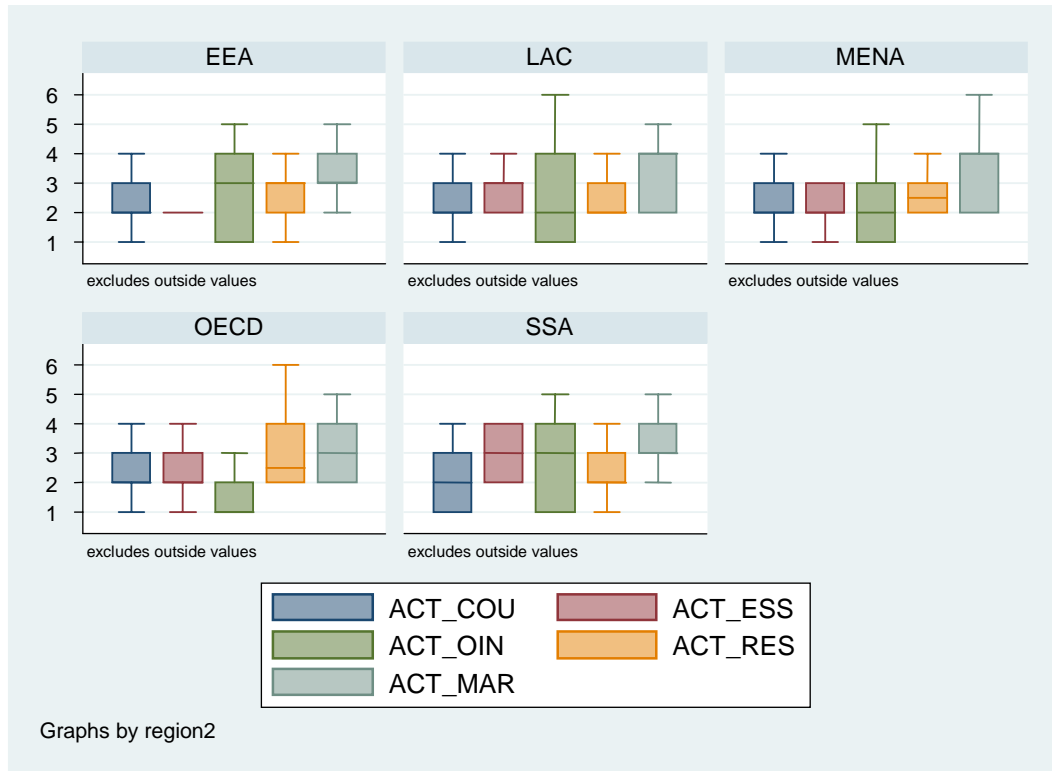
**Note:** The vertical axis shows the ratio of EPA's budgets to total exports expressed in percentage points. Each box provides the bounds for the 25<sup>th</sup> and 75<sup>th</sup> percentile in each region, and the lines coming out of the box provide the adjacent value to the 25<sup>th</sup> and 75<sup>th</sup> percentiles in each region. The line within the box provides the median.

**Figure 5: Importance of public funding in agencies budget by region**



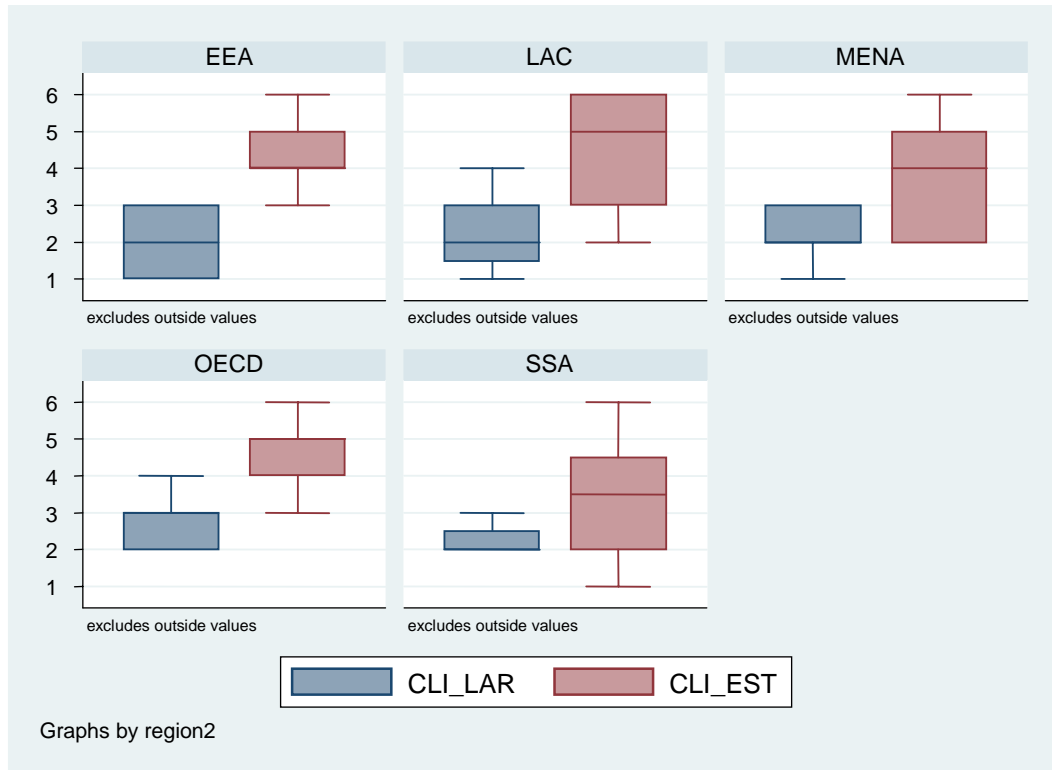
**Note:** The vertical axis shows the percentage of responses that correspond to each of the categories in the horizontal axis. The importance of public funding is a discrete variable that takes values between 1 and 6. A value of 1 indicates that public funding represents 0 percent of the budget; a value of 2 indicates that public funding is less than 10 percent of the budget; a value of 3 indicates that public funding is between 10 and 25 percent of the budget; a value of 4 indicates that public funding is between 25 and 50 percent; a value of 5 indicates that public funding is between 50 and 75 percent and a value of 6 indicates that public funding represents more than 75 percent of the budget.

**Figure 6: Export promotion agencies activities by region**



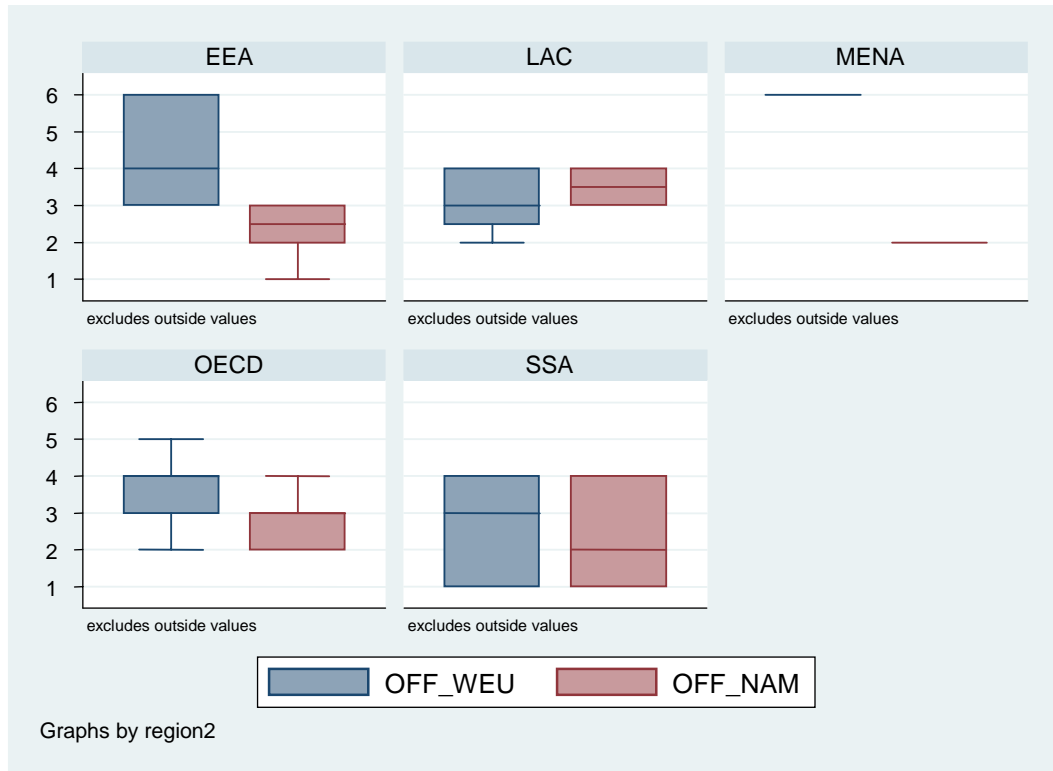
The share of each activity in total expenditure is a discrete variable that takes values between 1 and 6. A value of 1 indicates that the activity represents 0 percent of the total expenditure; a value of 2 indicates that the activity represents less than 10 percent of total expenditure; a value of 3 indicates that the activity represents between 10 and 25 percent of total expenditure; a value of 4 indicates that the activity represents between 25 and 50 percent; a value of 5 indicates that the activity represents between 50 and 75 percent and a value of 6 indicates that the activity represents more than 75 percent of total expenditure. The 5 activities considered are country image building (act\_cou), export support services (act\_ess), marketing (act\_mar), research and publications (act\_res), and other activities not related to export promotion (act\_oin). Each box provides the bounds for the 25<sup>th</sup> and 75<sup>th</sup> percentile in each region, and the lines coming out of the box provide the adjacent value to the 25<sup>th</sup> and 75<sup>th</sup> percentiles in each region. The line within the box provides the median.

**Figure 7: Export promotion agencies activities by type of client and by region**



The share of each type of client in total expenditure is a discrete variable that takes values between 1 and 6. A value of 1 indicates that the type of client represents 0 percent of the total expenditure; a value of 2 indicates it represents less than 10 percent of total expenditure; a value of 3 indicates that it represents between 10 and 25 percent of total expenditure; a value of 4 indicates that it represents between 25 and 50 percent; a value of 5 indicates that it represents between 50 and 75 percent and a value of 6 indicates that it represents more than 75 percent of total expenditure. The 2 types of clients considered are large (cli\_lar) and established (cli\_est). Each box provides the bounds for the 25<sup>th</sup> and 75<sup>th</sup> percentile in each region, and the lines coming out of the box provide the adjacent value to the 25<sup>th</sup> and 75<sup>th</sup> percentiles in each region. The line within the box provides the median.

**Figure 8: Geographic decomposition of offices abroad by region**

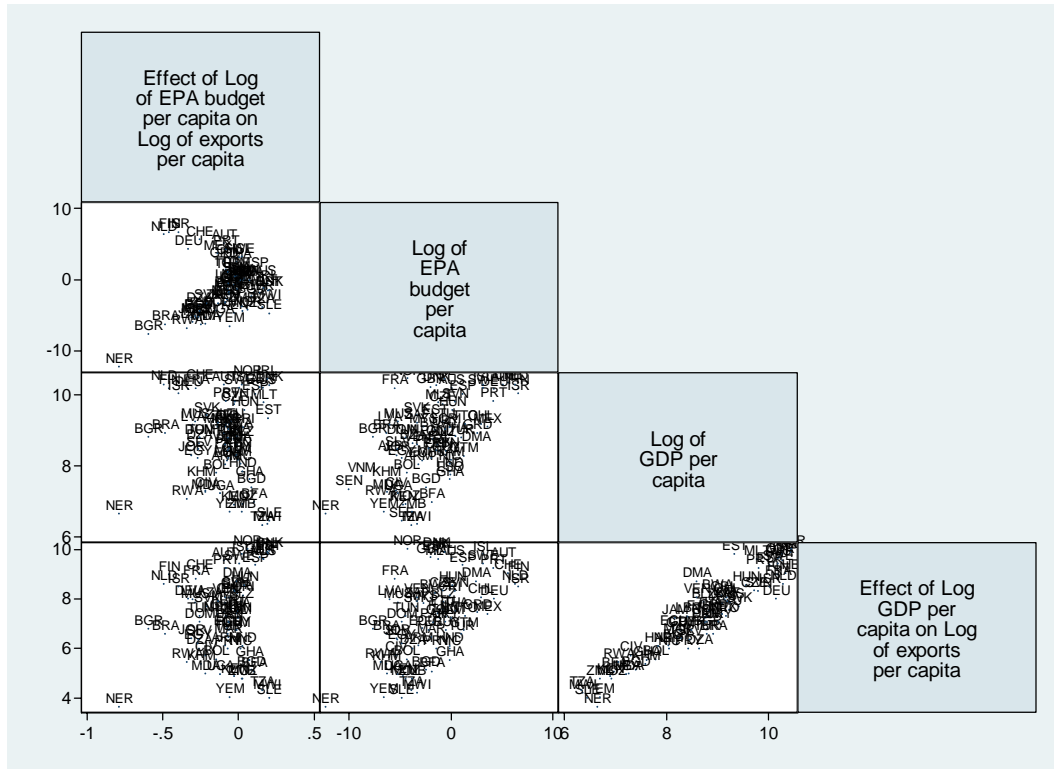


**Note:** The share of the budget of offices abroad spent in Western Europe (WEU) and North America (NAM) is a discrete variable that takes values between 1 and 6. A value of 1 indicates that the expenditure in a particular region represents 0 percent of the total expenditure of offices abroad; a value of 2 indicates it represents less than 10 percent of total expenditure of offices abroad; a value of 3 indicates that it represents between 10 and 25 percent of total expenditure; a value of 4 indicates that it represents between 25 and 50 percent; a value of 5 indicates that it represents between 50 and 75 percent and a value of 6 indicates that it represents more than 75 percent of total expenditure. Each box provides the bounds for the 25<sup>th</sup> and 75<sup>th</sup> percentile in each region, and the lines coming out of the box provide the adjacent value to the 25<sup>th</sup> and 75<sup>th</sup> percentiles in each region. The line within the box provides the median.





**Figure 11: Impact of EPA budget on exports by level of income and budget size**



Note: The top axis is the predicted impact of EPA budget on exports per capita, and the bottom right axis is the predicted impact of GDP per capita on exports per capita using the estimates of the regression results reported in the fourth column of Table 3 (Heckman estimates).