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## Abstract <sup>\*</sup>

This paper provides evidence on the channels through which export promotion institutions affect bilateral trade using a sample of Latin American and Caribbean countries over the period 1995-2004. We find that these institutions have a larger impact on the extensive margin of exports, especially in the case of trade promotion organizations.

**Keywords:** Export Promotion, Trade Margins, Latin America

**JEL-Code:** F13, C23.

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# 1 Introduction

Recent papers have shown that public institutions operating abroad such as diplomatic representations and trade promotion organizations have significant effects on aggregate bilateral trade (e.g., Rose, 2007; Gil et al., 2008).<sup>1</sup> Although useful, these contributions do not allow us to understand how actions performed by these institutions affect trade. More specifically, evidence on whether their effects take place on the intensive or extensive margins of trade (or both) is entirely missing. This short paper aims at filling this gap in the literature by documenting the role played by both diplomatic foreign missions and offices of export promotion agencies in shaping bilateral exports from Latin American and Caribbean countries along both the intensive and extensive margins over the period 1995-2004.

## 2 Export Promotion Institutions and Trade Margins

Export is a complex activity affected by information incompleteness. Firms pursuing cross-border economic opportunities must engage in a costly process of identifying potential exchange partners and assessing their reliability, trustworthiness, timeliness, and capabilities (Rangan and Lawrence, 1999). It is well known that gathering information may have positive externalities. Hence, underinvestment in those activities might be expected. If search is subject to free-riding, then there may be, under certain circumstances, a rationale for export promotion policies (Rauch, 1996). Diplomatic foreign missions and trade promotion organizations, by informing on foreign markets and disseminating information on domestic products, may contribute to overcoming this problem and henceforth to expanding exports.<sup>2</sup>

Importantly, the strength of the information barriers is likely to differ across specific export activities. In particular, these barriers can be expected to be more severe when

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<sup>1</sup> Lederman et al. (2006) find that export promotion agencies have a strong and statistically significant effect on countries' total exports. Furthermore, Nitsch (2007a) reports that state visits have on average a positive impact on bilateral exports. Moreover, Rose (2004, 2005) and Nitsch (2007b) analyze the influence of international organizations and country groupings such as the G7 on trade flows, respectively.

<sup>2</sup> Of course, these institutions also entail costs. Thus, assessing these institutions from the point of view of social welfare would require contrasting these costs against the benefits they may potentially generate. Such an assessment is beyond the scope of this paper.

introducing new export products (extensive margin) than when attempting to expand sales abroad of an already exported good (intensive margin) (e.g., Volpe Martincus and Carballo, 2008). The reason is that relevant informational requirements associated with exporting (e.g., the alternative ways of shipping the merchandise and their corresponding costs, the condition to enter foreign markets and their demand profiles, etc) would probably be more easily met in the latter case. The impact of trade promotion institutions, as information cost reducing mechanisms, may accordingly differ across these trade margins. More precisely, a stronger impact could be anticipated on the product-extensive margin. This is particularly true for trade promotion organizations. Diversification is clearly a core objective as declared in their statement of purpose and it is therefore a natural measure by which to evaluate the impact of their interventions (see Jordana et al., 2009). Furthermore, trade promotion organizations are generally better endowed in terms of personnel with specialized marketing expertise and are therefore *a priori* in a better position to alleviate the specific information problems impeding exports of new products than pure diplomatic missions. However, evidence on the (potentially asymmetric) effects of trade promotion institutions across export margins is absent. Disentangling the effects of diplomatic foreign missions and export promotion agencies along the different export margins can then be insightful from both academic and policymaking perspectives. This is precisely what we aim at in this paper.

### **3 Empirical Methodology**

We identify the effect of trade promotion institutions on bilateral exports from Latin American and Caribbean to all countries using the “gravity” model of trade.<sup>3</sup> According to the basic version of this model trade flows between two countries depend positively on their economic sizes and negatively on their distance. Conventionally, variables capturing other relevant determinants of international trade are added to this specification such as common membership in a free trade agreement, the use of a common language, and the existence of colonial links. We extend this list by adding two variables which account for the presence of diplomatic foreign missions and trade promotion organizations in

importing countries and assess whether they play a role in shaping exports after conditioning on all other traditional factors. In particular, we estimate by OLS the following equation:

$$\ln X_{ijt} = \beta_1 TPO_{ijt} + \beta_2 EmbCon_{ij} + \beta_3 \ln Dist_{ij} + \beta_4 PTA_{ijt} + \beta_5 Lang_{ij} + \beta_6 ColTies_{ij} + \beta_7 ComCol_{ij} + \beta_8 Is_{ij} + \beta_9 Land_{ij} + \delta_{it} + \lambda_{jt} + \omega_t + \mu_{ijt} \quad (1)$$

where  $i$  indexes exporter countries,  $j$  importer countries, and  $t$  time;  $X$  denotes exports;  $TPO$  is a binary variable taking the value of 1 if the trade promotion organization of the exporter country has an office in the importer country and 0 otherwise;  $EmbCon$  is the number of diplomatic representations (embassies and consulates) of the exporter country in the importer country; remaining variables control for other factors that are likely to affect bilateral trade flows: (the natural logarithm of) the distance between (the main cities in) the trading partners ( $Dist$ ); membership in the same preferential trade agreement ( $PTA$ ), sharing a common language ( $Lang$ ), former colonial ties ( $ColTies$ ), sharing the same colonizer ( $ComCol$ ), and whether there are island ( $Is$ ) or landlocked ( $Land$ ) countries among the trading partners;  $\mu$  is the stochastic error. Finally, all time-varying country-specific variables such as GDP and population are captured by exporter-year and importer-year fixed effects ( $\delta_{it}$  and  $\lambda_{jt}$ , respectively), whereas common macroeconomic effects are controlled for by year fixed effects ( $\rho_t$ ).<sup>4</sup>

Notice that  $X = N(X/N)$ , where  $N$  is the number of products exported as determined by counting the 6-digit HS codes registering positive exports to each specific destination and will be our proxy for the extensive margin of exports, while  $X/N$  stands for average exports per product and will be our proxy for the intensive margin of exports. Since OLS is a linear operator, regressions of each these factors on the explanatory variables additively decompose their effects on these export margins. Hence, in order to determine these separate effects, we estimate:

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<sup>3</sup> This model has a long tradition in the empirical trade literature. It has been extremely successful in explaining trade flows. Furthermore, a solid theoretical foundation has been now established for this model (e.g., Anderson and van Wincoop, 2003, 2004).

<sup>4</sup> Our survey suggests that trade promotion agencies operate abroad either directly through own offices or, in some cases, through embassies and consulates. Further, some countries have both offices of their agencies and diplomatic representations in certain importing economies. In particular, with only a few exceptions, offices of trade promotion organizations are located in countries where there is at least one diplomatic representation, which most likely has been opened before. Hence, these offices are in fact an additional presence of trade promotion institutions in the importer country and therefore their impact on trade is most properly compared to that of additional diplomatic missions as opposed to the existence of such missions at all (i.e., a count variable instead of a binary variable).

$$\ln N_{ijt} = \beta_1^N TPO_{ijt} + \beta_2^N EmbCon_{jt} + \beta_3^N \ln Dist_{jt} + \beta_4^N PTA_{ijt} + \beta_5^N Lang_{ijt} + \beta_6^N ColTies_{jt} + \beta_7^N ComCol_{jt} + \beta_8^N Is_{jt} + \beta_9^N Land_{ijt} + \delta_{it}^N + \lambda_{jt}^N + \omega_t^N + \mu_{ijt}^N \quad (2)$$

$$\ln(X_{ijt}/N_{ijt}) = \beta_1^{XN} TPO_{ijt} + \beta_2^{XN} EmbCon_{jt} + \beta_3^{XN} \ln Dist_{jt} + \beta_4^{XN} PTA_{ijt} + \beta_5^{XN} Lang_{ijt} + \beta_6^{XN} ColTies_{jt} + \beta_7^{XN} ComCol_{jt} + \beta_8^{XN} Is_{jt} + \beta_9^{XN} Land_{ijt} + \delta_{it}^{XN} + \lambda_{jt}^{XN} + \omega_t^{XN} + \mu_{ijt}^{XN} \quad (3)$$

## 4 Data

We use bilateral trade data for Latin American and Caribbean countries over the period 1995-2004 from COMTRADE. Data on offices abroad of export promotion agencies have been collected directly from these agencies through a survey, whereas data on embassies and consulates in each possible trade partner directly has been collected from the websites of the corresponding Ministries of Foreign Affairs.<sup>5</sup> Our dataset also includes traditional gravity variables. Data on bilateral distance, common border, common language, colonial ties, common colonizer and island and landlocked conditions are from the databases maintained by CEPII. Data on preferential trade agreements are those used by Glick and Rose (2002) and are generously provided by Andrew Rose in his website. These data are complemented and updated with information reported in the WTO's webpage.

## 5 Results

Table 1 reports estimates of Equations (1)-(3). The results suggest that both export promotion institutions help increase bilateral trade along both the intensive and extensive margins. Notice, however, that their effects are asymmetric. More specifically, they are larger on the extensive margin. Furthermore, opening an office of the trade promotion organization in the importer country has a substantially larger impact on bilateral exports

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<sup>5</sup> We use two alternative definitions of offices of export promotion offices: a conservative definition, which only considers commercial offices and a liberal definition which also includes representation offices, and promotion and distribution centers. Estimates reported below are based on the former definition. Results obtained with the latter are almost identical and are available from the authors upon request. In addition, we should mention that, due to lack of precise date information, offices of export promotion agencies are assumed to be opened the same year these agencies started to operate. The index  $t$  on TPO then reflects the fact that some agencies began their operations after our initial sample year. Finally, following Rose (2007), the number of embassies and consulates is determined excluding honorary consulates. This number is assumed to remain constant over the period. This seems to be a sensible assumption as changes in the number of diplomatic foreign missions have not been substantial.

than placing an additional diplomatic mission and this differential impact is clearly stronger on the extensive margin.<sup>6</sup> This coincides with our priors.

Most standard gravity variables have the expected sign and are significant. Thus, preferential trade agreements, lower distance, direct colonial ties, having a common colonizer, and not being islands are associated with increased trade along both margins.<sup>7</sup>

Baseline estimates based on OLS might potentially suffer from biases originated in diverse econometric problems. First, trade flows display inertia and tend to be correlated across groups of countries. In other words, serial- and cross-sectional correlations are likely to be present in our data. Second, there may be a selection of countries into trading partners, which would generate a correlation between the unobserved error terms and the independent variable thus leading to inconsistent estimates. Third, ignoring the impact of the number of exporting firms might result in biased estimates (Helpman et al., 2008). Fourth, endogeneity may be present in the form of reverse causality. In particular, countries may set up foreign representations in those partners where exports are relatively large (e.g., Rose, 2007). We have therefore performed several robustness checks to address these econometric issues, including: Prais Winsten with panel corrected standard errors, Poisson à la Santos Silva and Tenreyro (2006), correction for sample selection, correction à la Helpman et al. (2008), “System” GMM à la Blundell and Bond (1998), and certain combinations of these strategies. Results from these alternative estimations are presented in Table 2. Overall they confirm our main findings. Hence, there seems to be consistent evidence that export promotion institutions affect bilateral exports along both the intensive and extensive margins. In particular, they have a larger impact on the

number of exported goods, especially in the case of offices of trade promotion organizations. Furthermore, this impact is larger than that of diplomatic missions.

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<sup>6</sup> The statistical significance of the difference between the estimated coefficients across equations is based on a test performed after a SUR (Seemingly Unrelated Regressions) estimation involving Equations (2) and (3).

<sup>7</sup> These results are robust to using alternative specifications including binary variables accounting for common land borders, membership in the WTO, and common currencies.

## **6 Conclusions**

In this short paper we have explored the existence of potentially asymmetric effects of export promotion institutions across export margins using data for Latin American and Caribbean countries over the period 1995-2004. We find that diplomatic foreign mission and trade promotion organizations tend to be associated with larger exports along both margins. However, their effects are non-uniform. Opening an office of these organizations abroad seems to contribute more to increasing the number of goods sold abroad than to expanding average exports and this contribution is larger than that of additional diplomatic representations.

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Table 1

<b>The Impact of Export Promotion Institutions on the Intensive and Extensive Margins of Exports</b>			
<b>Variables</b>	<b>X</b>	<b>N</b>	<b>X/N</b>
<b>Office of Trade Promotion Organization</b>	0.574*** (0.073)	0.371*** (0.029)	0.203*** (0.054)
<b>Number of Embassies and Consulates</b>	0.075*** (0.016)	0.045*** (0.011)	0.030*** (0.007)
<b>Preferential Trade Agreement</b>	1.451*** (0.075)	0.710*** (0.031)	0.741*** (0.054)
<b>Distance</b>	-2.484*** (0.045)	-1.123*** (0.019)	-1.362*** (0.031)
<b>Common Language</b>	0.953*** (0.069)	0.583*** (0.027)	0.370*** (0.053)
<b>Colony</b>	0.921*** (0.140)	0.421*** (0.050)	0.499*** (0.122)
<b>Common Colonizer</b>	1.373*** (0.114)	0.638*** (0.045)	0.735*** (0.084)
<b>Island</b>	-0.648*** (0.091)	-0.168*** (0.035)	-0.480*** (0.068)
<b>Landlocked</b>	-0.031 (0.183)	0.018 (0.066)	-0.049 (0.146)
<b>Exporter-Year Fixed Effects</b>	Yes	Yes	Yes
<b>Importer-Year Fixed Effects</b>	Yes	Yes	Yes
<b>Year Fixed Effects</b>	Yes	Yes	Yes
<b>Observations</b>	25,638	25,638	25,638
<b>R<sup>2</sup></b>	0.787	0.824	0.700
<b>Office of Trade Promotion Organization - Embassies and Consulates</b>	0.498*** (0.077)	0.326*** (0.032)	0.172*** (0.056)
<b>Office of Trade Promotion Organization (N)- Office of Trade Promotion Organization (X/N)</b>		0.169*** (0.065)	
<b>Embassies and Consulates (N) - Embassies and Consulates (X/N)</b>		0.015* (0.008)	
<b>[Office of Trade Promotion Organization (N)- Office of Trade Promotion Organization (X/N)]-[ Embassies and Consulates (N) - Embassies and Consulates (X/N)]</b>		0.153** (0.067)	

Robust standard errors reported below the estimated coefficients in parentheses. The tests of the statistical difference of the estimated coefficients across equations are based on a SUR estimation. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 2

The Impact of Export Promotion Institutions on the Intensive and Extensive Margins of Exports						
Alternative Econometric Approaches						
Econometric Approach	Office of Trade Promotion Organization			Number of Embassies and Consulates		
	X	N	X/N	X	N	X/N
<b>Prais-Winsten with Panel Corrected Standard Errors</b>	0.556*** (0.074)	0.359*** (0.029)	0.197*** (0.055)	0.073*** (0.016)	0.044*** (0.011)	0.029*** (0.007)
<b>Poisson</b>	0.299*** (0.083)	0.112*** (0.028)		0.009*** (0.002)	0.013*** (0.001)	
<b>Heckman Correction for Sample Selection</b>	0.656*** (0.226)	0.377*** (0.093)	0.278* (0.159)	0.256** (0.123)	0.104** (0.043)	0.152* (0.087)
<b>Correction for Sample Selection and Firm Extensive Margin Proposed by Helpman et al. (2008)</b>	0.163** (0.073)	0.107** (0.051)	0.059** (0.027)	0.035*** (0.010)	0.010* (0.006)	0.027*** (0.007)
<b>System GMM</b>	0.746*** (0.091)	0.482*** (0.036)	0.264*** (0.067)	0.098*** (0.02)	0.058*** (0.014)	0.039*** (0.009)
<b>Prais-Winsten with Panel Corrected Standard Errors with Correction for Sample Selection</b>	0.667*** (0.247)	0.410*** (0.100)	0.256 (0.177)	0.225*** (0.070)	0.144*** (0.031)	0.085* (0.046)
<b>System GMM with Correction for Sample Selection</b>	0.879*** (0.299)	0.540*** (0.036)	0.336* (0.180)	0.333** (0.148)	0.161*** (0.057)	0.152*** (0.057)

In the Poisson estimations, the dependent variables are in absolute levels (not natural logarithms). This estimation cannot be performed on average exports per product (X/N) since this is a non-integer number. In correcting for sample selection, we first estimate probit models and then incorporate the Mills ratio obtained from these estimations in the main equation. These Mills ratios are derived from a year-by-year probit which includes all variables, with one vector for contemporaneous values and one for each lagged and forward values (Wooldridge, 2002). Identification comes from an index of similarity in population's religious beliefs (Helpman et al., 2008), the average and the difference of the trading partners' GDP, and the absolute difference of the countries' endowments of capital, arable land, and skilled labor, relative to their working-age population, which are included in the selection equation but not in the main equation. When identification is based only on the religion index, estimation results are essentially the same. These results are available from the authors upon request. In the GMM estimations, we instrument *TPO*, *EmbCon*, and *PTA* with a set of economic determinants of trade and trade agreements, namely, the average and the difference of the trading partners' GDP, the GDP of the rest of the world, the absolute difference of the countries' relative endowments of the aforementioned production factors (Baier and Bergstrand, 2004). In addition, given that exporters are likely to open offices in countries which are economically important we also use as instruments the average of the economies' population and the importers' shares of total world imports. Finally, to control for preferences of diplomatic corps and representatives of trade promotion organizations, we include international arrivals of tourists to account for desirability of the destination countries as residing places. The tests for second order autocorrelation and the Hansen tests for overidentifying restrictions suggest that the GMM estimates are consistent. These specification tests are available from the authors upon request. All estimations include exporter-year, importer-year, and year fixed effects. Robust standard errors reported below the estimated coefficients in parentheses in all cases, but in the Prais-Winsten estimations, where standard errors are corrected for serial correlation and cross-sectional correlation. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

*Additional Data Sources:* Data on gross domestic product over the sample period are expressed in purchasing power parity and come from the World Development Indicators. The perpetual inventory method has been applied as indicated in Kamps (2004) with a depreciation rate of 13.3% (e.g., Schott, 2003) on gross fixed capital formation reported by the World Bank's World Development Indicators to derive countries' capital stocks. Data on countries endowments of arable land come from the Food and Agriculture Organization (FAO), whereas data on economy-wide labor data (i.e., population over 15 years) and the skill level of population (i.e., population with at least secondary school) from the database prepared by Barro and Lee (2000) over the period 1960-2000. Information on common currencies is that used by Glick and Rose (2002) and is kindly provided by Andrew Rose in his website. This information has been complemented and updated with that reported in Tsangarides et al. (2006). Data on population and tourist arrivals are from the World Development Indicators, whereas the countries shares in total imports have been calculated using trade data from COMTRADE. Finally, the proportion of population professing various religions, used as source of identification for selection into trading partners, are based on Guiso et al. (2003) and the CIA Fact Book.