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Constraints on Trade in the LAC Region

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ABSTRACT: This paper studies Latin America and the Caribbean's (LAC) trade performance in recent years and estimates the salience of key country-specific factors in explaining underperformance in some sub-regions within LAC. First, the paper documents that, while the average country in the region displays aggregate trade values that are consistent with a standard gravity model, there is substantial heterogeneity across sub-regions and product-types. The paper then estimates an augmented gravity specification that includes proxies for the quality of infrastructure, the availability and quality of factors of production, and governance. Results point to infrastructure and customs regulation as key factors explaining undertrading in manufacturing in most sub-regions. Factors of production partly explain South America's underpeformance in manufacturing while governance explains undertrading across most product groups, but neither set of factors play a significant role in other sub-regions.

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I. INTRODUCTION

There is a widely held perception that countries in the Latin America and Caribbean (LAC) region are significantly less integrated into global markets than those in other countries, and that this hampers the region's development potential. IMF (2015) concludes that, since the mid-1980s, LAC has remained more closed than other emerging market regions, and most economies in the region are under-trading given their fundamentals. This has been true despite policy efforts in the region to lower trade barriers. Also, compared to other regions, countries in LAC have lower levels of intra-regional trade and tend to have less diversified exports, which remain concentrated in a relatively small number of low value-added commodities and natural resource-based products. The region's participation in global value chains is also very limited. Finally, LAC lags behind when it comes to SME's role in international trade and displays strong geographical disparities – a small handful of localities with the LAC region dominate exports. The bottom line is that trade in the LAC region has yet to reach its full potential as a driver of growth and development.

Based on surveys of country authorities in the LAC region conducted between September 2015 and September 2016, Mowatt (2017) finds that constraints to increasing the volume of exports from LAC, as well as their diversification and sophistication, stem from both domestic and international factors. However, domestic factors – such as quality of infrastructure, skills development, and high production costs – tended to outweigh international factors in the surveys.

Against this backdrop, this paper provides a systematic assessment of LAC's trade performance relative to other countries and studies the factors affecting trade flows to and from countries in the region. More precisely, the paper addresses two questions: 1) Are trade volumes in the LAC region significantly lower than what would be expected given their economic, cultural, and geographical characteristics? And 2) what factors, other than gravity and trade policy variables, hinder the region's trade integration potential?

The paper's results show that, except for services, LAC as a whole displays trade volumes that are consistent with economic and geographic characteristics. However, aggregate results mask substantial within-LAC heterogeneity. Empirical results presented in this paper point to significant under-performance in trade across all product groups for the Caribbean region (including services). In South America lower-than-predicted trade volumes (based on a baseline gravity model that controls for bilateral gravity variables and exporter and importer GDP and population) are dominated by trade in manufactured goods and services, while in Central America (excluding Mexico) under-trading is dominated by merchandise trade, that is trade in both manufactured goods and primary commodities. By contrast, the empirical results indicate significant over-trading in merchandise goods, and in particular manufactured products, for Mexico.

The paper then augments the baseline gravity model to study potential factors behind trade underperformance in different subregions within LAC. We first study whether trade policy variables, relating to both tariff and non-tariff barriers, can help explain any trade under-performance in the sub-regions. We then go on to further augment the model with a number of variables from the World Bank's International Logistics Performance Index (LPI), Business Enterprise surveys, and World Governance Indicators aimed at capturing the significance (or otherwise) of three sets of factors that could affect trade performance: transport infrastructure and efficiency of customs clearance, access to and quality of factors of production, and the quality of governance. Our empirical results from the 'augmented' gravity model show that these characteristics are important factors behind South America's trade underperformance, but less so for Central America and the Caribbean. Trade policy variables help to explain over-trading in merchandise goods for Mexico.

To the best of our knowledge, neither the International LPI index nor the Business Enterprise survey database have been used in any empirical analysis looking at the main constraints on trade in the LAC region. Behar, Manners, and Nelson (2013) indeed apply a gravity model that accounts for firm heterogeneity and multilateral resistance to show that a one standard deviation improvement in logistics is equivalent to a 14 percent decline in distance.[1] However, a couple of important caveats need to be borne in mind in exploiting this rich dataset. The first, which is common to all surveys, is that it is difficult to judge how representative the Business Enterprise survey results are of the population as a whole. Moreover, this survey dataset is about perceptions, and these may differ in important respects from reality in some cases. The second caveat has to do with the international dimension of the survey dataset: the openness of respondents to answering the questions may vary considerably from country to country. For example, apart from cultural differences, business managers in autocratic and closed regimes may be more reluctant to express openly their views compared with business managers operating in more democratic regimes. Nevertheless, it is still a useful exercise to exploit this database and examine the implications of the perceptions of local business managers on the key constraints affecting their business operations.

Given the focus of the paper, we do not estimate a fully saturated gravity model as proposed in recent contributions (see Baldwin and Taglioni, 2006). In this sense, our results cannot be framed in the context of a structural gravity framework. Yet, the empirical strategy adopted allows us to directly address the questions at the heart of the paper. We also focus on the 2015-2018 period, which roughly coincides with the decline in commodity prices that affected many countries in the Latin America and the Caribbean region and with the slowdown in global trade, and which avoids the trade disruptions triggered by the COVID-19 pandemic.

The rest of the paper is organized as follows. Section II reviews the empirical evidence and literature on trade in the LAC region. Section III discusses the key constraints on trade that have been put forward in the literature to explain why trade volumes in the LAC region are below their potential. Section IV provides information on the data sources used for the empirical work in this paper and describes the econometric approach that is used to examine the trade performance of the LAC region. Section V presents the empirical results, including estimates of the impact on trade volumes of the logistics and survey constraints and the governance indicators. Section VI summarizes the conclusions of our empirical study.

II. DOES THE LAC REGION TRADE TOO LITTLE?

Latin America and the Caribbean (LAC) and emerging Asia engaged in strong trade liberalization in the 1990s, focused on the reduction of tariffs, through either unilateral actions or trade agreements. However, as Morgan (2017) points out, non-tariff barriers (NTBs) have been increasing, and in particular sanitary and phytosanitary (SPS) standards and technical barriers to trade (TBTs) designed to protect humans, animals, and the environment and to guaranteeing minimum technical standards. The decline in transportation costs, which also spurred trade during the previous two decades, appears to have faded since the Global Financial Crisis.

Much of the existing empirical literature suggests that the LAC region trades significantly less than would be expected on the basis of its economic, cultural, and geographical characteristics. Indeed, Figure 1 shows that

[1] Multilateral resistance refers to the importance of *relative* trade costs in determining trade flows, that is bilateral trade costs relative to the trade costs faced by other trading partners.

the LAC region is less open to trade than most comparable EMDE regions of the world, except for Sub-Saharan Africa. Moreover, over the period 2015-21, Figures 2-7 show that both exports and imports of goods and services as a share of GDP were comparable to Emerging and Developing Asia (EmAsia) and Sub-Saharan Africa (SSA), but significantly lower than Emerging and Developing Europe (EmEur) and the Middle East and North Africa (MENA); however, non-oil exports in percent of GDP were similar to, or higher than, most comparable EMDE regions except for EmEur.

At the same time, in terms of openness to trade, it is important to note that the LAC region exhibits vast cross-country differences: over the period 2015-21, period average exports of goods and services in percent of GDP varied from 14.3% in Brazil to 38.3% in Mexico; non-oil exports from 8.3% in Colombia to 34.1% in Mexico; and imports of goods and services from 14.1% in Argentina to 39.4% in Mexico and 43.3% in the Caribbean.

Empirical results presented in IMF (2015) provide evidence that the LAC region trades well below its potential. It reports the results of gravity estimations for bilateral trade flows to formally assess comparative trade performance across economies. Their results suggest that observed export intensities are lower than what would be predicted based on standard economic, geographic, and cultural determinants; that is, most economies in the region have been found to under-trade relative to fundamentals drawn from gravity models. Moreover, LAC's comparative standing, in terms of bilateral trade intensity gaps relative to Asia, has worsened over time, driven mainly by South America. IMF (2015) concludes that, since the mid-1980s, LAC has remained more closed than other emerging market regions, and most economies in the region are under-trading given their fundamentals. This has been true despite policy efforts in the region to lower trade barriers.

At the same time, while intraregional trade as a share of LAC exports is lower than in other regions (such as Europe or Asia), LAC appears to have similar levels of regional trade integration if we restrict the comparators to emerging markets and developing countries (EMDCs) only. A clear difference, though, relates to the composition of trade flows within the region, with trade being more heavily oriented toward final goods than in other regions.

Cerra et al (2017) also find that Latin America's trade is less intra-regionally integrated compared to the rest of the world. With about 15 percent of total exports destined to markets within the region, LAC lags behind developed economies in Asia and Europe, where intra-regional destinations account for well over 50 percent of exports. The authors argue that low levels of intra-regional trade largely reflect the weak connectivity among countries due to geographic factors and low investment in infrastructure, evidenced by a lack of adequate roads and railways as well as inefficiencies at ports and airports, although with considerable heterogeneity across countries. The study also notes that intra-regional trade in LAC is more heavily oriented towards final goods, whereas intra-regional trade in other developing regions is concentrated in intermediate goods. The concentration of LAC's intra-regional trade in final goods is consistent with the concentration of the region's trade in primary commodities, given the region's natural resource endowments, which to some extent limits the immediate scope for the region to increase intra-regional trade.

More recently, Salinas (2021) benchmarks studies the determinants of export diversification by extending a standard gravity framework with structural factors similar to the ones included in this paper (i.e., infrastructure, quality and availability of factors of production, and governance). There are two key differences his work and the analysis in this paper. Methodologically, in contrast to Salinas (2021) the analysis in this paper estimates trade performance by way of a Poisson pseudo-Maximum Likelihood (PPML) estimator, which considers zero trade flows. This feature is particularly important when benchmarking trade in services. Second, Salinas (2021) benchmarks trade performance in manufacturing for a large set of countries, while our focus is on a larger set of products and centers around the LAC region.

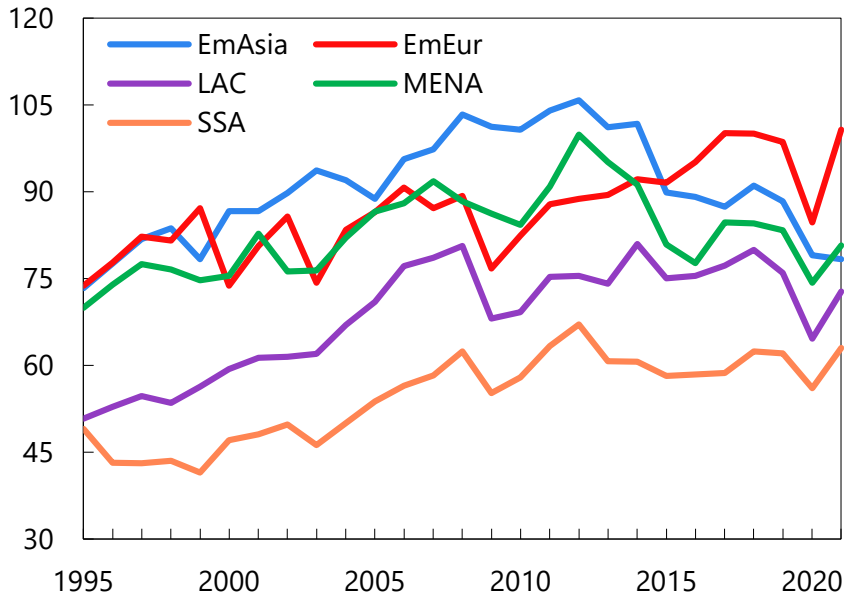
Campos, Pienknagura, and Timini (2023) compare globalization patterns between seven Latin American countries and countries in Asia. The authors estimate border thickness (Bergstrand and others, 2015), that captures the cost of trading internationally relative to the costs of trading domestically, for countries in both regions. Similar to this paper, the authors find that, as a whole, Latin American countries do not underperform. However, there is high degree of heterogeneity within the region.

Bown, Lederman, Pienknagura and Robertson (2017) further emphasize the need to boost growth and reduce transport costs in order to raise intra-regional trade flows. Empirical results presented in their report suggest that the average pair of countries in the LAC region has intraregional trade flows that are in line with, or exceed, what is predicted by gravity variables. That is, once one controls for economic and geographic characteristics, LAC does not display a significant intra-regional trade gap. By contrast, the East Asia and Pacific region has levels of intraregional trade that are statistically lower than those predicted by gravity variables. In short, there is no evidence indicating that LAC underperforms in terms of intra-regional trade once standard gravity variables such as distance and contiguity are taken into account. This result stresses the importance of gravity variables in explaining the region's apparent underperformance in intra-regional trade.

The authors of the above study also highlight that the conclusions of the gravity benchmarking are sensitive to the definition of region because the inclusion or exclusion of countries can change the size and distance of the average pair of countries in the region. For instance, an assessment of integration in the Americas (as opposed to the LAC region alone) provides substantially different conclusions: intra-American trade is statistically larger compared to what gravity variables would predict, suggesting that the inclusion of the United States and Canada boosts trade in the Americas beyond what would be predicted by their economic size and distance to LAC countries.

Figure 1: Trade Openness

(Percent of GDP; regional median)

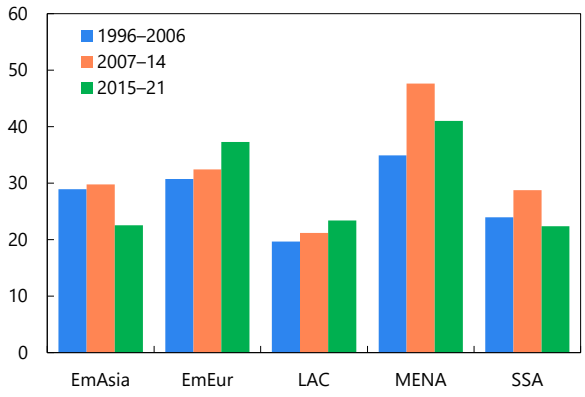


Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: Openness is the sum of exports and imports. EmAsia = emerging and developing Asia; EmEUR = emerging and developing Europe; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Sahara Africa.

Figure 2: Exports of Goods and Services

(Percent of GDP)

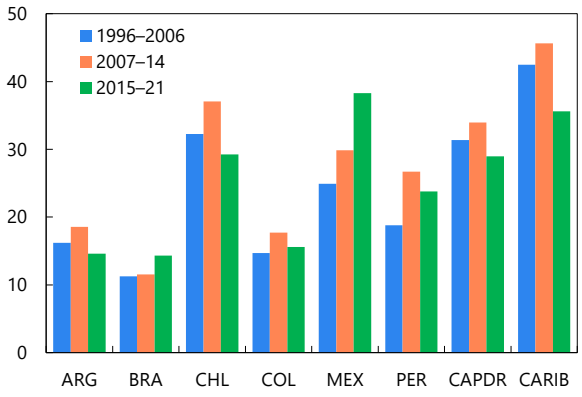


Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: Regional aggregates are US dollar nominal GDP-weighted averages. EmAsia = emerging and developing Asia; EmEur = emerging and developing Europe; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Sahara Africa.

Figure 3: Exports of Goods and Services

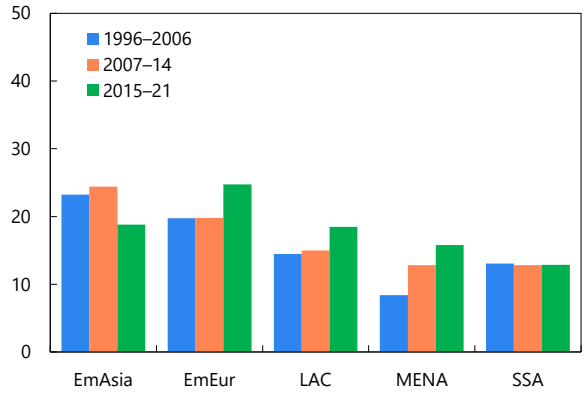
(Percent of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.

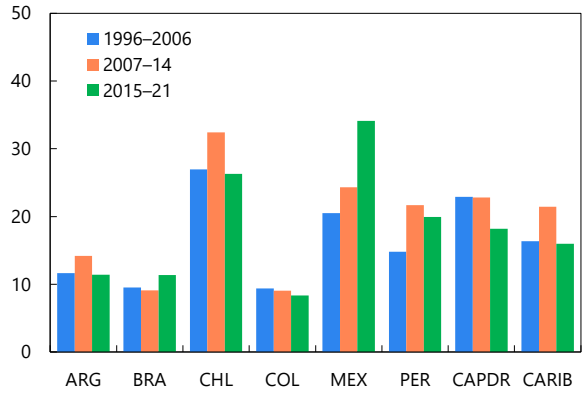
Note: Regional aggregates are US dollar nominal GDP-weighted averages. CAPDR = Central America, Panama, and the Dominican Republic; CARIB = Caribbean.

Figure 4: Non-Oil Exports
(Percent of GDP)



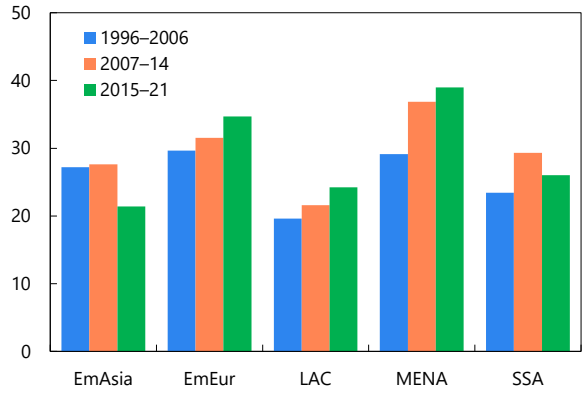
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Regional aggregates are US dollar nominal GDP-weighted averages. EmAsia = emerging and developing Asia; EmEur = emerging and developing Europe; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Sahara Africa.

Figure 5: Non-Oil Exports
(Percent of GDP)



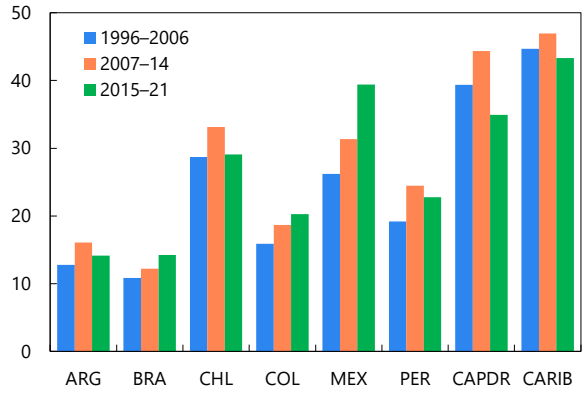
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Regional aggregates are US dollar nominal GDP-weighted averages. CAPDR = Central America, Panama, and the Dominican Republic; CARIB = Caribbean.

Figure 6: Imports of Goods and Services
(Percent of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Regional aggregates are US dollar nominal GDP-weighted averages. EmAsia = emerging and developing Asia; EmEur = emerging and developing Europe; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Sahara Africa.

Figure 7: Imports of Goods and Services
(Percent of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Regional aggregates are US dollar nominal GDP-weighted averages. CAPDR = Central America, Panama, and the Dominican Republic; CARIB = Caribbean.

III. KEY CONSTRAINTS ON TRADE IN THE LAC REGION

The nature of the key constraints on trade in the LAC region has changed over time. From the 1960s to the 1990s the main source of trade costs for LAC countries were traditional trade policy measures such as tariffs, import restrictions, and quotas, as countries in the region embraced protectionist policies. This, however, began to change starting in the early 1990s as countries across the region adopted trade liberalization policies. Through a combination of unilateral tariff reductions, participation in multilateral trade talks, and the emergence of numerous regional trade agreements, LAC countries managed to reduce the burden of traditional trade costs considerably in the course of a decade and a half. Instead, a new set of trade costs – especially those associated with transportation, customs clearance, logistics and information – emerged as the main barriers to trade expansion and economic integration for the LAC region by the early 2000s. Poor roads, slow customs procedures, and lack of market information began to pose major constraints on the export performance of firms operating in LAC (Kahn, Estevadeordal, and Moreira (2015)).

Moreira, Volpe, and Blyde (2008) and Moreira, Blyde, Volpe and Molina (eds., 2013) look in detail at the impact of transport costs on Latin American and Caribbean trade and argue that the main factors behind relatively high transport costs in the LAC region are regulation, the region's dilapidated transport infrastructure, and the lack of competition in the transport industry. Empirical results reported in Moreira, Blyde, Volpe and Molina (eds., 2013) suggest that LAC5 countries would enjoy a considerable increase in exports by lowering transport costs, with Colombia benefiting the most and Mexico the least.[2] More specifically, the increase in exports resulting from a 1% reduction in ad valorem transport costs would vary from 2½% (Mexico) to 8% (Colombia) for manufacturing, 4% (Mexico) to 8% (Colombia) for agriculture, and 1½% (Brazil) to 6% (Colombia) for mining.

Results from a survey of country authorities in the LAC region, conducted between September 2015 and September 2016, find that constraints to increasing the volume and diversification of exports from LAC include both domestic and international factors. However, domestic factors – such as quality of infrastructure, skills development, and high production costs – tended to outweigh international factors in the survey. Moreover, non-tariff barriers are widely perceived by country authorities to be considerably more of a constraint to exporting than tariff barriers. Mowatt (2017) summarizes the key findings of the survey as follows:

- A major constraint to export growth is infrastructure weaknesses and transportation costs.
- Human capital remains an important constraint on growth of exports for Latin America.
- Lack of access to finance is another important challenge facing potential exporters.
- High energy costs are also an important constraint, particularly in the Caribbean.
- Small size is seen as a major obstacle to Caribbean integration with Latin America

We now go on to study the relative importance of four broad groups of factors in constraining the expansion of trade – both intra- and inter-regional – by countries in the LAC region: (i) tariffs and non-tariff barriers; (ii) transport infrastructure and customs regulations; (iii) access to, and quality of, factors of production; and (iv) the quality of

[2] LAC5 countries include Brazil, Mexico, Colombia, Peru, and Chile.

governance.

IV. DATA AND ECONOMETRIC STRATEGY

Our empirical analysis uses data from a variety of sources. Data for merchandise trade flows, manufacturing trade flows and non-manufacturing trade flows come from CEPII's Gravity database (see Conte, Cotterlaz, and Mayer, 2022). Data is reported at the exporter country-importer country-year level, and, for each country-pair, trade flows are deflated and are averaged over the 2012-2019 period. The dataset reports trade flows from three sources: the IMF's Direction of Trade Statistics database (DOTS), the UN's Comtrade database, and CEPII's BACI database. In our analysis we use flows from BACI for two reasons. First, flows are reported at the aggregate level (merchandise) and broken down between manufacturing and non-manufacturing goods. Second, by using mirrored data, BACI enlarges the coverage of country pairs compared to DOTS and Comtrade.

In addition to trade flows, CEPII's Gravity database reports other bilateral and country level variables necessary to estimate gravity models. Data includes bilateral distance (between capital cities), a dummy taking value one if the country pair shares a common language, a dummy taking value one if the country pair shares a land border, a dummy taking value one if the country-pair has a preferential trade agreement in force, a dummy taking value one if the country is landlocked, GDP in current USD and population. We complement these variables with additional trade policy variables. These include the importer country's trade weighted merchandise MFN tariff, accessed through the World Bank's World Development Indicators, and a measure of non-tariff trade restrictiveness from Estefania-Flores et al. (2022).[3]

Data on bilateral trade in services are from the WTO-OECD Balanced Trade in Services (BaTIS) database. The database leverages all official statistics available at the national level and supplements them with estimations and adjustments to provide users with a complete matrix of exports and imports of services. Subsequently, the asymmetries between reported and mirror flows are reconciled by calculating a symmetry-index weighted average between the two, following a similar approach to the one developed for merchandise trade statistics. Details on the data and its construction can be found in Liberatore and Wettstein (2021).

At the heart of our paper is the analysis of how three policy clusters (infrastructure, logistics and customs; factors of production; and governance) affect trade flows. Data on infrastructure, logistics and customs come from two sources. The first source is the World Bank's logistics performance index (LPI), which presents information on six core components: 1) the efficiency of customs and border management clearance, 2) the quality of trade transport infrastructure, 3) the ease to arrange competitively priced shipments, 4) the competence and quality of logistics services, 5) the ability to track and trace consignments, and 6) the timely delivery of shipments. For our econometric analysis we use data on the first two components, each one taking values between 1 (low) and 7 (high). The second source is the World Bank's Enterprise surveys (WBES), which reports information on the number of firms in each country reporting transport and customs as an obstacle to business operations, respectively. Our baseline specification controls for the first two subcomponents of the LPI for both the export and importer country. In one specification we also expand the model to include data on the number of mobile broadband users per 100 inhabitants, a proxy for digital infrastructure.

Data on the quality and access to key factors of production are from WBES and from the Penn World Tables

[3] The authors construct an empirical measure of how restrictive official government policy is towards the international flow of goods and services, from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), which they label the Measure of Aggregate Trade Restrictiveness (MATR).

(PWT), revision 10.1. From the latter we use an index of human capital based on a country's average years of schooling. From the former we use data on the share of firms that report access to finance and access to electricity as obstacles for firm performance. As a robustness check, instead of using the PWT index of human capital, we proxy human capital quality with data from the WBES on the share of firms reporting access to an adequately educated labor force as a major or very severe constraint on business operations.

The final group of variables used in the analysis are governance variables and they come from two sources. First, we use data from WBES on the share of firms reporting corruption, political instability, and crime, theft and violence as major obstacles, respectively. As a robustness check, we ran a separate set of regressions using data from the World Governance Indicators (WGI) on control of corruption, the rule of law, and absence of violence, respectively. Box 1 provides a full list of the variables used in the analysis, as well as the abbreviations used in the tables.

To benchmark Latin American and the Caribbean's performance we estimate an extended gravity model. Given the prevalence of zero trade flows and concerns about heteroskedasticity, we estimate our model using the Poisson pseudo-maximum likelihood (PPML) estimator proposed by Santos Silva and Tenreyro (2006).[4] More precisely, we estimate the following model:

$$T_{i,j}^{x} = exp\{\alpha_0 + \alpha_1 \ln(GDP_i) + \alpha_2 \ln(GDP_j) + \alpha_3 \ln(POP_i) + \alpha_4 \ln(POP_j) + \alpha_5 \ln(d_{ij}) + \alpha_6 w_{ij} + \alpha_7 TP_{ij} + \alpha_8 Z_i + \alpha_9 Z_j + +\beta LAC\} + \varepsilon_{ij} \quad (1)$$

Where $T_{i,j}^{x}$ is the average trade flow over the period 2015-2019 between country *i* and country *j* in product family $x \in$ {merchandise, services, manufacturing goods, and primary commodities}, GDP is average GDP in each country, POP is population, d is the bilateral distance between the country pair, w is a set of bilateral and country-specific variables including a common language dummy, a common land border dummy, and a landlocked dummy for both exporter and importer, and TP is a vector of trade policy variables. The vectors Z_i and Z_j are either proxies of logistics and customs for both the exporter and importer, respectively, proxies of the quality and availability of factors of production, or proxies of governance. Finally, LAC can be either a dummy that takes value one if the exporter or importer are in LAC, or a vector of four dummies that take value one if the exporter or importer are in either South America, Central America, the Caribbean or Mexico.

Our main objective is to study the economic and statistical significance of β. With that aim, we conduct a sequential estimation of (1), where we first force α_7, α_8 and α_9 to be equal to zero (a stripped gravity estimation), then we add the effects of policy variables (forcing only α_8 and α_9 to be equal to zero) and then we proceed to estimate the full augmented model by including each cluster of variables at a time. For expositional conciseness, we show the estimated values of β in figures, deferring full estimation results to Annex I.

Note that, given the focus of the paper, we do not estimate a fully saturated gravity model as proposed in recent contributions (see Baldwin and Taglioni, 2006; Felbermayr and Yotov, 2021). In this sense, our results cannot be framed in the context of a structural gravity framework. Yet, the empirical strategy adopted allows to directly address the questions at the heart of the paper. We also focus on the 2015-2019 period for several reasons. First, this is a period which roughly coincides with the decline in commodity prices that affected many countries

[4] As argued by the authors, in the presence of heteroskedacity, the coefficients of log-linearized models are biased. Moreover, Santos Silva and Tenreyro (2011) show that the PPML estimator performs well even in the presence of a large share of zero flows data. Zero trade flows could reflect the fixed costs of exporting amid heterogeneity across product groups.

in the Latin America and the Caribbean and with the slowdown in global trade. It also avoids the disruptions in trade flows arising from the COVID-19 pandemic. Finally, there are several studies benchmarking Latin America and the Caribbean's trade prior to 2015 (e.g., IMF, 2015, Bown and others, 2017).

Box 1: Gravity Model: Explanation of Variables

Trade variables

$LTrTOT_{ij}$	Log of total trade flows, merchandise and services, in current US dollars between Country *i* and Country *j*
$LTrMRC_{ij}$	Log of total merchandise trade flows in current US dollars between Country *i* and Country *j*
$LTrMANU_{ij}$	Log of trade flows of manufacturing goods in current US dollars between Country *i* and Country *j*
$LTrPRIPD_{ij}$	Log of trade flows of primary commodities in current US dollars between Country *i* and Country *j*
$LTrSERV_{ij}$	Log of trade flows of services in current US dollars between Country *i* and Country *j*
LAC	Dummy variable taking the value of one if exporting Country i is in the Latin American and Caribbean region, zero otherwise
SA	Dummy variable taking the value of one if exporting Country *i* is in South America, zero otherwise
CA	Dummy variable taking the value of one if exporting Country *i* is in Central America, zero otherwise
MEX	Dummy variable taking the value of one if either the exporting Country I or the importing Country j is Mexico
CAR	Dummy variable taking the value of one if exporting Country *i* is in the Caribbean sub-region, zero otherwise

Gravity Variables

$LGDP_i$ / $LGDP_j$	Log of GDP, in current US dollars, of Country *i* / Country *j*
$LPOP_i$ / $LPOP_j$	Log of population of Country *i* / Country *j*
LDISTANCE	Log of distance (km) between the capital cities of Countries *i* and *j*
LANG	Dummy variable taking the value of one if Countries *i* and *j* share a common language, zero otherwise
BORDER	Dummy variable taking the value of one if Countries *i* and *j* share a common border, zero otherwise
$LANDLL_i$ / $LANDLL_j$	Dummy variable taking the value of one if Country *i* / Country *j* is landlocked, zero otherwise

Box 1: Gravity Model: Explanation of Variables (cont.)

Trade Policy Variables (TP)

TRI_j	Non-tariff trade barrier index for importing Country *j* from the Measure of Aggregate Trade Restrictiveness (MATR) database computed by Estefania-Flores and others (2022).
$MFNT_j$	Most favored nation (MFN) tariff imposed by importing Country *j* on imports from Countries not having a preferential trade / tariff agreement with Country *j* (weighted by trade values across import lines)
RTA	Dummy variable taking the value of one if both Countries *i* and *j* have a regional trade agreement in place, zero otherwise
NAFTA	Dummy variable taking the value of one if both Countries *i* and *j* are members of the NAFTA trade agreement, zero otherwise

Infrastructure and Customs

$LPITRANS_i$ / $LPITRANS_j$	Value of the *quality of trade and transport infrastructure* component of the World Bank's International Logistics Performance Index (LPI) for exporting Country *i* / importing Country *j*. Higher values denote better infrastructure.
$LPICUST_i$ / $LPICUST_j$	Value of the *efficiency of customs and border clearance* component of the World Bank's International Logistics Performance Index (LPI) for exporting Country *i* / importing Country *j*. Higher values denote higher efficiency.
$BESTRANS_i$ / $BESTRANS_j$	Percent of firms in Country *i* / Country *j* that trade that identify transport as a major or very severe constraint on the operations of their business
$BESCUST_i$ / $BESCUST_j$	Percent of firms in Country *i* / Country *j* that trade that identify customs regulations and clearance as a major or very severe constraint on the operations of their business
$MBUSERS_i$ / $MBUSERS_j$	Number of mobile broadband users per 100 inhabitants in Country *I* Country *j*

Quality and Access of Factors of Production

$BESFIN_i$ / $BESFIN_j$	Percent of firms in Country *i* / Country *j* that trade that identify access to finance as a major or very severe constraint on the operations of their business
$BESELEC_i$ / $BESELEC_j$	Percent of firms in Country *i* / Country *j* that trade that identify electricity as a major or very severe constraint on the operations of their business

Box 1: Gravity Model: Explanation of Variables (cont.)

$BESSKLAB_i$ / $BESSKLAB_j$	Percent of firms in Country *i* / Country *j* that trade that identify an inadequately educated workforce as a major or very severe constraint on the operations of their business
HCI_i	Human Capital Index for exporting Country *I*, from the Penn World Tables

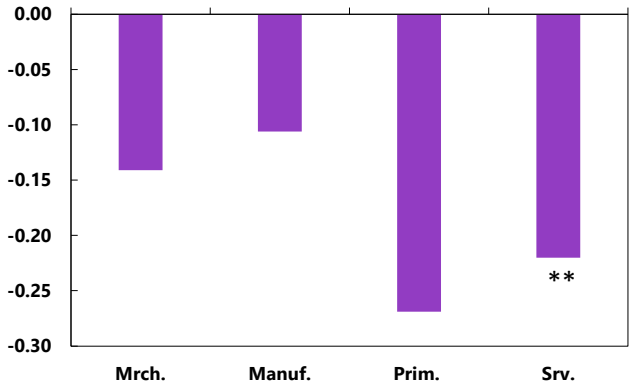
Governance and Institutions

$BESCORR_i$ / $BESCORR_j$	Percent of firms in Country *i* / Country *j* that trade that identify corruption as a major or very severe constraint on the operation of their business
$BESCRI_i$ / $BESCRI_j$	Percent of firms in Country *i* / Country *j* that trade that identify crime, theft and disorder as a major or very severe constraint on the operation of their business
$BESPOLINST_i$ / $BESPOLINST_j$	Percent of firms in Country *i* / Country *j* that trade that identify political instability as a major or very severe constraint on the operation of their business
$BESGOVAvg_i$ /	Simple average of the above three governance indicators for Country *I* /
$BESGOVAvg_j$	Country $_j$ from the World Bank's Business Enterprise Surveys
$WGICORR_i$ / $WGICORR_j$	World Governance Indicator (WGI) aggregate indicator for Country *i* / Country *j* on control of corruption
$WGIPOLST_i$ / $WGIPOLST_j$	World Governance Indicator (WGI) aggregate indicator for Country *i* / Country *j* on political stability and absence of violence / terrorism
$WGIROL_i$ / $WGIROL_j$	World Governance Indicator (WGI) aggregate indicator for Country *i* / Country *j* on rule of law
$WGIGOVAvg_i$ / $WGIGOVAvg_j$	Simple average of the above three governance indicators for Country *I* / Country *j* from the World Governance Indicator

V. RESULTS

We begin by presenting results stemming from the standard gravity model, with regional dummies (separately) for Latin America and the Caribbean (LAC) as a whole and for four sub-regions, namely South America (SA), Central America (CA), Mexico (MEX), and the Caribbean (CAR) (Tables 1 and 2 in Annex I). These baseline regressions, with no policy variables or proxies for constraints to trade, show significant under-trading only in the case of services for Latin America as a whole (Figure 8).

Figure 8. Baseline Results—LAC



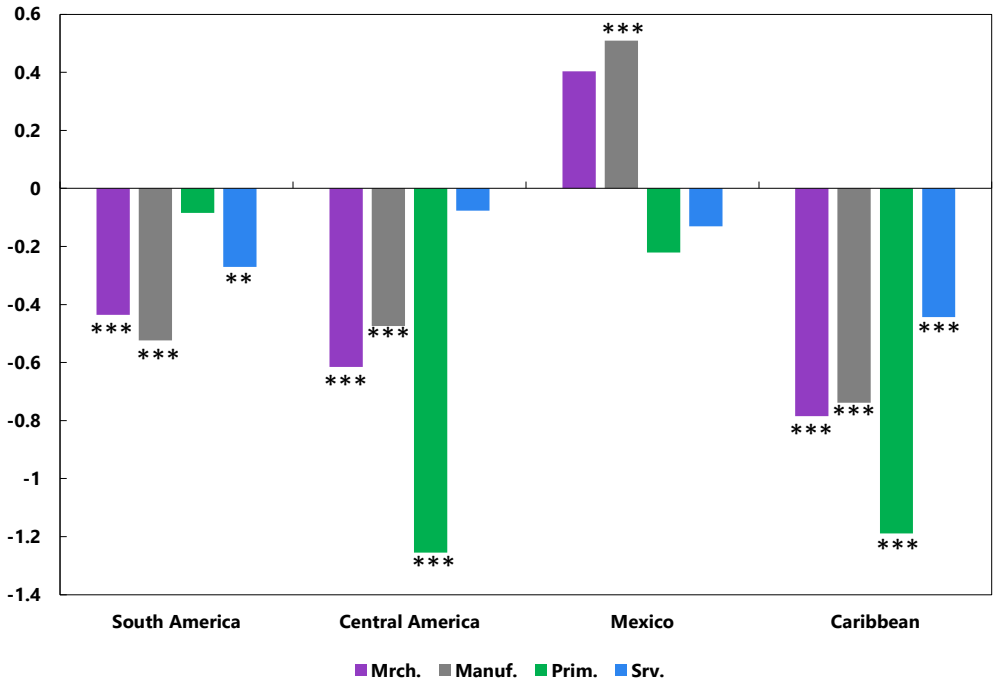
Note: ** statistically significant at the 5 percent level. Otherwise, not statistically significant.

To dig deeper into Latin America and the Caribbean's trade performance, the rest of the section extends the analysis in two directions. First, we assess whether LAC's trade performance differs when studying trade between LAC countries and extra-regional partners as opposed to trade occurring between regional partners. Next, we turn to studying the relative trade performance of different sub-regions within LAC.

Our analysis suggests that intra-regional trade in LAC is lower compared to what would be predicted by economic and geographic factors (Table 3). In the case of merchandise trade we find that, consistent with the results in Tables 1 and 2, the coefficient for extra-regional trade is negative but is not statistically significant. By contrast, intra-regional trade is negative and statistically significant. In the case of trade in services, results point to substantial under-trading both with extra- and intra-regional partners, with more pronounced under-trading in the case of intra-regional trade.

Our results also point to significant differences across sub-regions (Figure 9). Evidence points to significant under-trading in manufactured goods and services for South America, and significant under-trading across all product groups (merchandise trade, manufacturing, primary commodities, and services) for the Caribbean. Trade flows in Central America stand below the gravity benchmark in merchandise goods, both manufactured goods and primary commodities, but not in services. By contrast, the baseline regressions suggest significant *over-trading* in manufactured goods in the case of Mexico.

Figure 9. Baseline Results, by Sub-region



Note: *** Statistically significant at the 1 percent level, ** statistically significant at the 5 percent level., * statistically significant at the 10 percent level. Otherwise, not statistically significant.

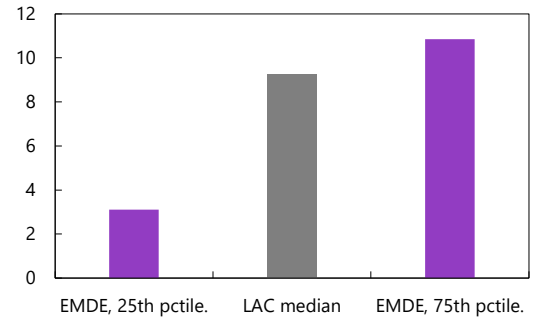
We next go on to augment the baseline gravity regressions with four sets of variables that can possibly explain each sub-regions' trade under-performance– trade policy variables; transport infrastructure and customs regulations; access to, and quality of, factor of production; and governance indicators.

Before presenting estimation results, Figure 10 illustrates the relative standing of LAC countries on key variables related to the four sets of constraints listed earlier. The figure presents the median value for the countries in LAC in our sample, together with the 25th and 75th percentile value for emerging market and development economies (EMDEs) excluding LAC countries.

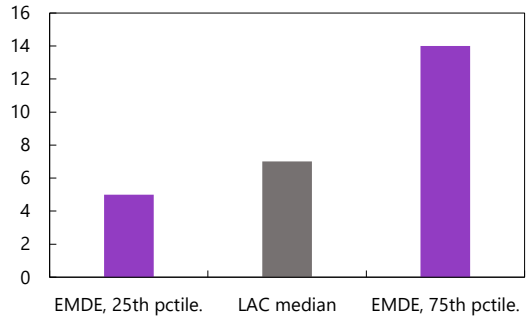
In most cases LAC countries stand in between the best and worst performers in EMDEs, suggesting scope for improvement. Three cases worth highlighting are non-tariff trade restrictions (MATR), electricity as a constraint, and governance as a constraint. In the case of MATR, the median LAC country stands close to the best performers among non-LAC EMDES, pointing to LAC countries having relatively low non-tariff restrictions. By contrast, issues related to governance and, especially, access to reliable electricity, appear to negatively affect disproportionately LAC countries relative to other EMDEs, as the median LAC country stands closer to the worst performers among EMDEs.

Figure 10. Benchmarking Constraints to Trade

Panel A. MFN tariff

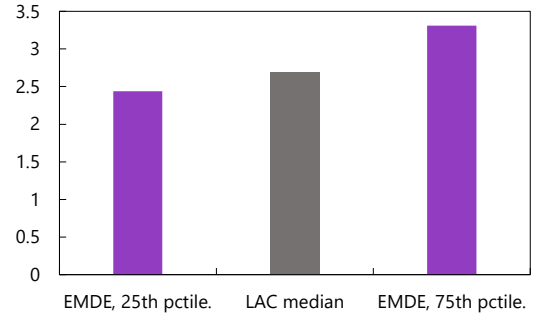


Panel B. Non-tariff Measured Aggregate Trade Restrictions

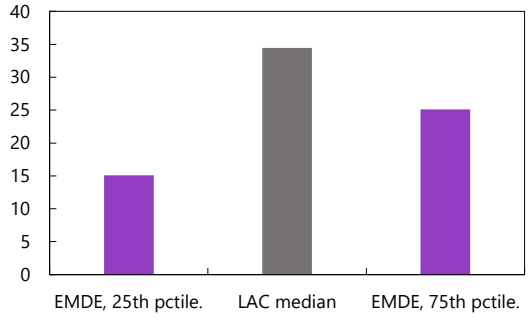


s

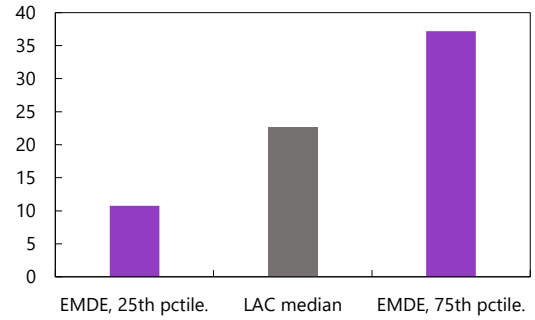
Panel C. Logistics Performance Index



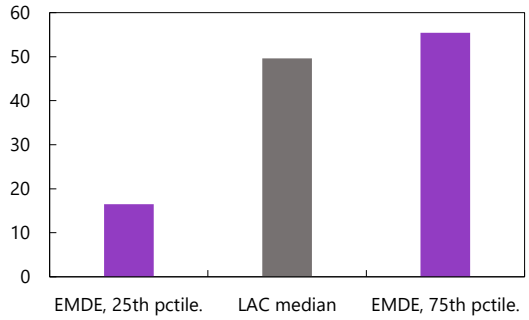
Panel D. Electricity as a Constraint



Panel E. Access to Finance as a Constraint



Panel F. Governance as a Constraint

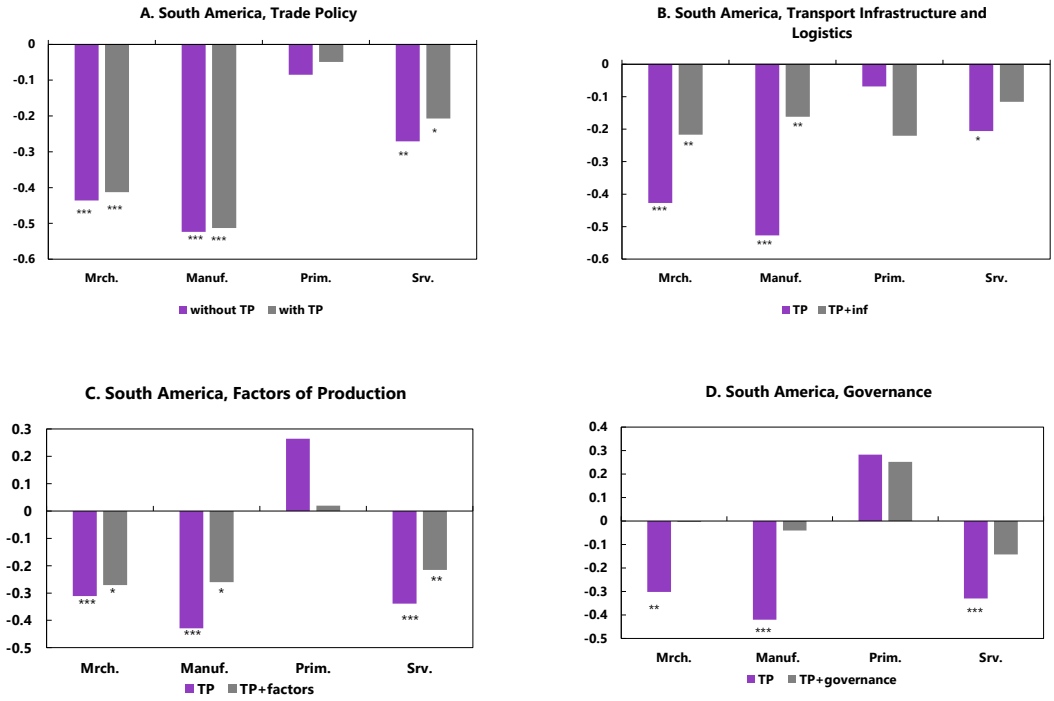


Source: Authors' calculations.
Note: Values are averages for the period 2015-2019. MFN tariffs are rates, MATR is a count of restrictions, the LPI is an index, and constraints are share of firms identifying each factor as a constraint. For governance, Panel F shows the country average for three indicators: corruption as a constraint, political instability as a constraint, and crime and violence as a constraint.

How do these factors shape LAC's trade performance? This question is tackled through an 'augmented' gravity equations, with results presented in Tables 4-13 and summarized in Figures 11-14. Our results point to the following:

- For *South America*, adding the trade policy variables has a negligible impact on the size and statistical significance of the coefficients for the regional dummy variable (Figure 11). On transport infrastructure and customs regulations, the value of the regional dummy coefficient halves when using the LPI index variables for trade in manufactured goods, but there is still significant under-trading. However, under-trading in services is fully explained away by the LPI index variables. Further adding a digital infrastructure variable – the number of mobile broadband users per 100 inhabitants – has only a marginal impact on the size and significance of the coefficient on the regional dummy. With regard to factor inputs, there is a notable reduction in the coefficient for the regional dummy for trade in manufacturing (but not services), when we include the WBES survey results for electricity and access to finance, together with the Human Capital Index from the Penn World Tables. Finally, inclusion of a simple average of the three governance variables from the WBES survey results (political instability, corruption, theft and crime) makes the coefficients on the regional dummies become statistically insignificant in all cases (i.e. across all product groups).

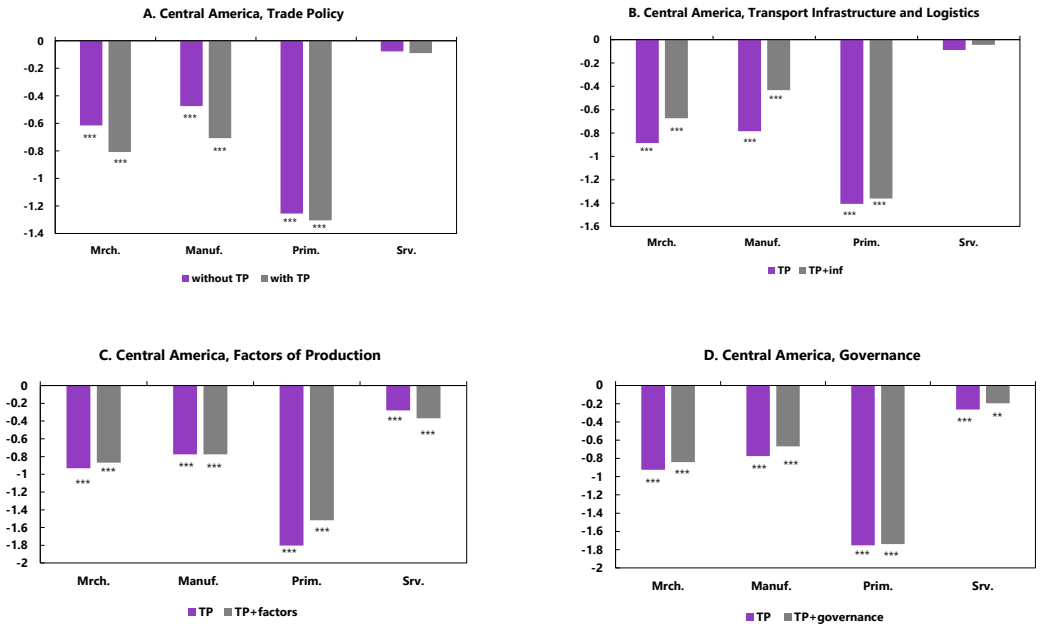
Figure 11. South America's Trade Performance



Note: *** Statistically significant at the 1 percent level, ** statistically significant at the 5 percent level., * statistically significant at the 10 percent level. Otherwise, not statistically significant.

- For *Central America*, neither the trade policy variables, nor the governance variables from the WBES survey results, have any notable impact on the values of the regional dummy coefficients, which continue to show significant under-trading for both manufactured goods and primary commodities (Figure 12). The LPI index variables, and in particular transport infrastructure, notably reduces the value of the regional dummy coefficient for trade in manufacturing but there is still significant under-trading; the impact on explaining under-trading in primary commodities is marginal. Inclusion of the Human Capital Index and the WBES survey results for electricity and access to finance also have very little impact on the value and statistical significance of the coefficients on the regional dummies, even though the coefficients on many of these factor input variables tend to be statistically significant and of the right sign.

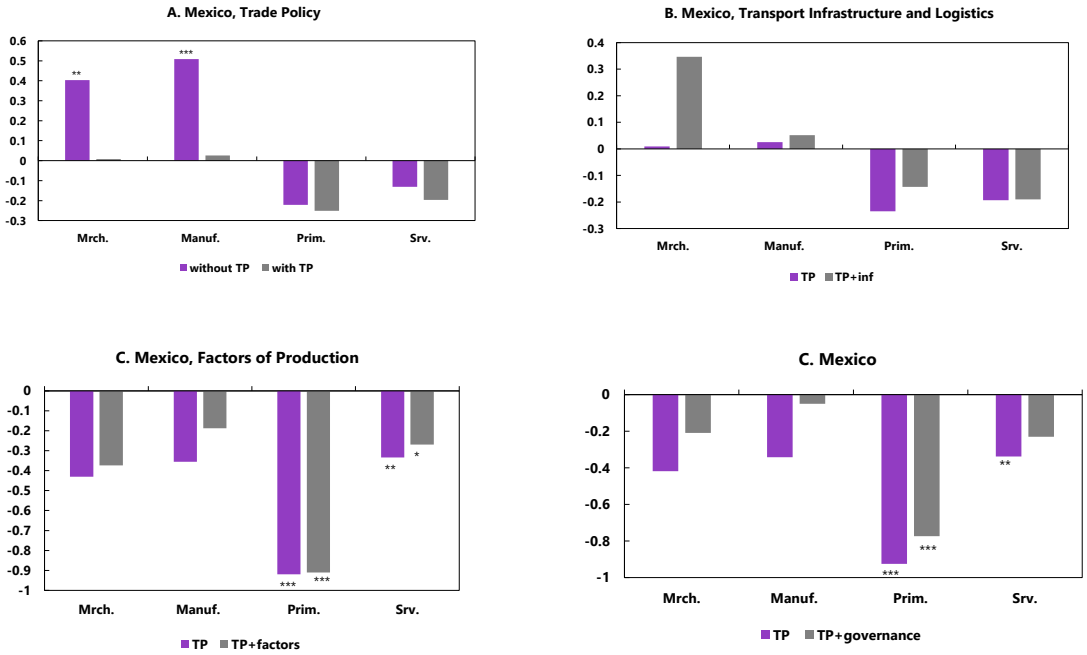
Figure 12. Central America's Trade Performance



Note: *** Statistically significant at the 1 percent level, ** statistically significant at the 5 percent level., * statistically significant at the 10 percent level. Otherwise, not statistically significant.

- For *Mexico,* the trade policy variables fully explain over-trading in merchandise trade, namely manufactured goods (Figure 13). However, addition of the NAFTA dummy implies significant *under-trading* in primary commodities, partly reflecting perhaps that NAFTA tends to favor trade in manufactured goods rather than trade in primary commodities, and hence may be encouraging resource re-allocation away from primary commodities towards manufactured goods. Also, the addition of the simple average of the three governance variables from the WBES survey results reduces a bit the extent of under-trading in primary commodities.

Figure 13. Mexico's Trade Performance

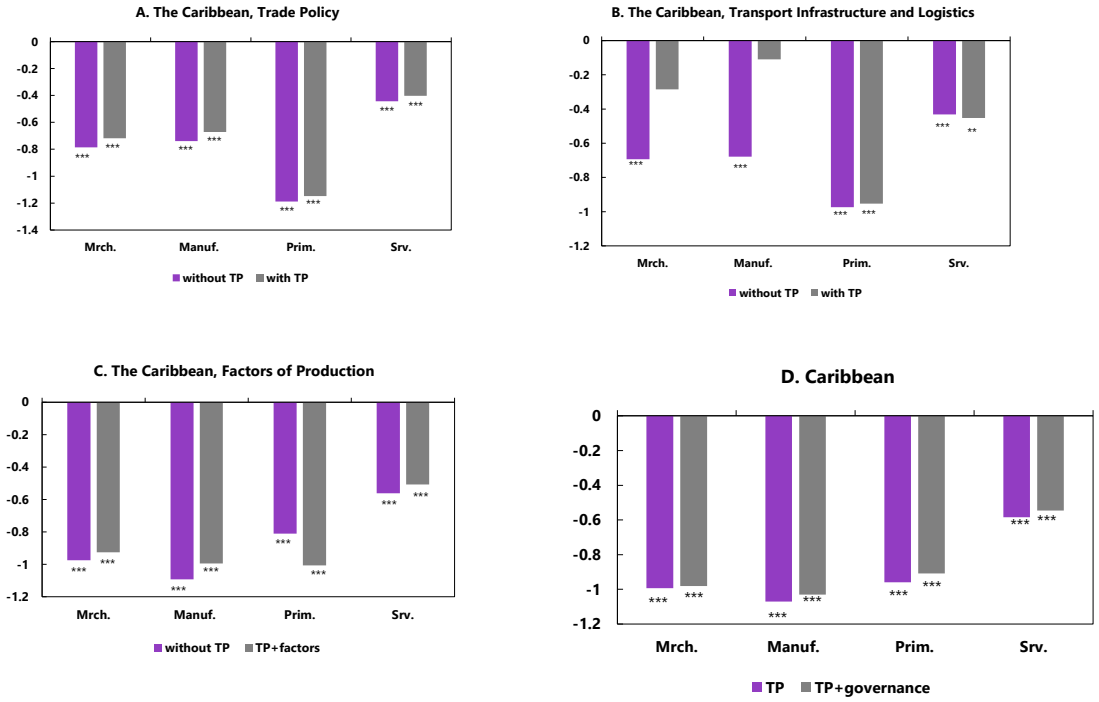


Note: *** Statistically significant at the 1 percent level, ** statistically significant at the 5 percent level., * statistically significant at the 10 percent level. Otherwise, not statistically significant.

- For the *Caribbean,* neither the trade policy variables nor the factor input variables can help explain under-trading in either merchandise trade or in services (Figure 14). The same applies for the governance variables from the WBES surveys. However, the regional dummy coefficient becomes statistically insignificant for merchandise trade when we use the LPI index variables for transport infrastructure and customs regulations, although there is no notable impact for trade in services.

We also carry out various robustness checks for trade in merchandise goods and services, which are presented in Tables 14-16. Table 14 reports regression results replacing the World Bank's International LPI index variables with the WBES survey results on transport and customs regulations as major or very severe constraints on business operations. Table 15 presents the results from replacing the Human Capital Index with the WBES survey results on an inadequately educated workforce as a major or very severe constraint for the 'factor input variables' augmented regressions. Finally, Table 16 presents the results of replacing the WBES governance indicators (political instability, corruption, theft and crime) with the WGI governance indicators (corruption, political stability and absence of violence / terrorism, and rule of law).

Figure 14. The Caribbean's Trade Performance



Note: *** Statistically significant at the 1 percent level, ** statistically significant at the 5 percent level., * statistically significant at the 10 percent level. Otherwise, not statistically significant.

In general, the results are less satisfactory when using the robustness check alternative variables. For South America the World Bank's WBES variables for transport and customs clearance fully explains under-trading in manufacturing, but there is negligible impact for trade in services. However, these variables have marginal impacts on the regional dummy coefficients for Central America and for the Caribbean. Also, results using the WBES survey results show a statistically significant sign that is the opposite from what one would expect for inadequately educated workforce as a major or very severe constraint for South America, while showing no notable impact on the coefficients for the regional dummies for Central America and the Caribbean. Finally, The WGI governance indicators help explain some under-trading in services, but not in merchandise trade, for South America; like the WBES governance variables, the WGI governance indicators do not seem to explain under-trading in Central America or the Caribbean.

To sum up: for *South America*, under-trading in merchandise goods, and in particular manufactured goods, is explained by the WBES governance indicators, and the LPI transport and customs variables also help to explain a large part of under-trading in manufactured goods. Under-trading in services is fully explained by transport and customs variables and the WBES governance indicators. For *Central America* under-trading in merchandise goods is not fully explained by any of the set of constraint variables, although the LPI index variables – and in particular transport infrastructure – significantly reduces the value of the regional dummy coefficient for trade in manufactured goods. For *Mexico*, the trade policy variables fully explain over-trading in merchandise goods, and in particular manufactured goods. However, addition of the NAFTA dummy implies significant under-trading in

primary commodities. This could be because NAFTA tends to favor trade in manufactured goods rather than trade in primary commodities, and thereby provides a strong disincentive for trade in the latter. For the *Caribbean*, under-trading in manufactured goods can be explained by the LPI transport and customs variables.

VII. CONCLUSIONS

Our baseline regressions, not taking into account any policy variables or constraints, provide significant evidence of under-trading in the LAC region only for services. However, when we disaggregate the data by sub-regions we find much broader evidence of under-trading. More specifically we find evidence of significant under-trading in merchandise goods, in particular manufacturing, and also in services for South America, and across all product groups – merchandise trade and services – for the Caribbean. Central America shows evidence of significant under-trading in merchandise goods, both manufactured goods and primary commodities, but not in services. By contrast, the baseline regressions suggest significant *over-trading* in manufactured goods in the case of Mexico. Our empirical results also suggest that LAC's under-performance in trade emanates from *intra-regional* trade rather than from *inter-regional* trade.

We then go on to augment the baseline gravity regressions with four sets of variables that can possibly explain the sub-regions under-performance in trade – trade policy variables; transport infrastructure and customs regulations; access to, and quality of, factors of production; and governance indicators.

In general, these additional variables, and in particular poor transport infrastructure and inefficiencies in customs clearance, help to explain a significant part of under-trading in the sub-regions. The LPI transport and customs variables explain away a large part of the under-trading in manufactured goods for *South America.* The WBES governance indicators are also significant in explaining under-trading in both manufactured goods and services for *South America*, but do not seem to explain under-trading in *Central America* or the *Caribbean.* Access to factor inputs cannot fully explain under-trading for any of the sub-regions, although for *South America* there is a notable reduction in under-trading in manufactured goods when we include the Human Capital Index from the Penn World Tables. For *Central America* under-trading in merchandise goods is not explained by any of the set of constraint variables, although the LPI index variables – and in particular transport infrastructure – significantly reduces the value of the regional dummy coefficient for trade in manufactured goods. For *Mexico*, the trade policy variables fully explain over-trading in manufactured goods. However, addition of the NAFTA dummy implies significant under-trading in primary commodities. This could be because NAFTA tends to favor trade in manufactured goods at the expense of trade in primary commodities, and hence may be encouraging resource re-allocation away from primary commodities towards manufactured goods. For the *Caribbean*, under-trading in manufactured goods can be explained by the LPI transport and customs variables.

To sum up, more research needed to understand (i) factors underpinning Central America's and the Caribbean's underperformance in trade, and (ii) the benefits of removing constraints behind LAC's trade underperformance.

Annex I. Tables of gravity model results

Table 1. Baseline gravity model regressions - Merchandise and Services Trade

DEPENDENT VARIABLE	**$LTrMRC_{ij}$**				**$LTrSERV_{ij}$**			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.778***	18.86	0.770***	19.72	1.048***	29.33	1.046***	29.50
$LGDP_j$	0.813***	14.36	0.803***	15.33	1.065***	36.81	1.063***	36.65
$LPOP_i$	-0.00525	-0.103	-0.00619	-0.125	-0.370***	-8.670	-0.369***	-8.661
$LPOP_j$	-0.126***	-2.595	-0.125***	-2.705	-0.369***	-10.65	-0.368***	-10.67
LDISTANCE	-0.427***	-7.066	-0.426***	-7.193	-0.597***	-19.20	-0.596***	-19.26
LANG	0.290***	2.739	0.327***	3.308	0.835***	10.09	0.841***	10.21
BORDER	1.159***	7.006	1.098***	7.462	-0.0285	-0.232	-0.0330	-0.273
LAC	-0.141	-0.905			-0.220**	-2.205		
SA			-0.436***	-5.211			-0.271**	-2.439
CA			-0.615***	-4.433			-0.0767	-0.885
MEX			0.403**	2.381			-0.131	-0.565
CAR			-0.785***	-4.469			-0.443***	-2.834
$LANDLL_i$	-0.134	-1.238	-0.144	-1.321	-0.284**	-2.445	-0.286**	-2.462
$LANDLL_j$	-0.283***	-2.593	-0.287***	-2.647	-0.167	-1.301	-0.168	-1.307
Constant	-12.91***	-10.02	-12.52***	-9.829	-23.71***	-33.67	-23.64***	-33.34
Observations	21,010		21,010		13,687		13,687	
R-squared	0.456		0.495		0.751		0.752	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 2. Baseline gravity model regressions - Manufacturing and Primary Commodities Trade

DEPENDENT VARIABLE	$LTrMANU_{ij}$				$LTrPRIPD_{ij}$			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.814***	17.35	0.806***	18.05	0.610***	13.34	0.600***	13.31
$LGDP_j$	0.855***	12.60	0.843***	13.55	0.624***	13.71	0.623***	13.57
$LPOP_i$	0.0159	0.279	0.0150	0.269	-0.0979*	-1.828	-0.0991*	-1.869
$LPOP_j$	-0.181***	-3.246	-0.180***	-3.405	0.133**	2.276	0.132**	2.264
LDISTANCE	-0.444***	-6.823	-0.442***	-6.939	-0.359***	-5.895	-0.364***	-6.070
LANG	0.291**	2.424	0.334***	3.008	0.213	1.493	0.234*	1.650
BORDER	1.154***	6.442	1.079***	6.829	1.190***	6.360	1.176***	6.442
LAC	-0.106	-0.589			-0.269	-1.500		
SA			-0.524***	-6.575			-0.0847	-0.424
CA			-0.474***	-3.295			-1.255***	-5.256
MEX			0.509***	2.755			-0.221	-0.624
CAR			-0.739***	-4.044			-1.189***	-4.794
$LANDLL_i$	0.0312	0.255	0.0256	0.210	-0.911***	-5.637	-0.946***	-5.882
$LANDLL_j$	-0.235**	-1.987	-0.238**	-2.021	-0.751***	-5.316	-0.760***	-5.374
Constant	-14.24***	-9.396	-13.81***	-9.227	-9.633***	-8.350	-9.333***	-8.072
Observations	21,010		21,010		21,010		21,010	
R-squared	0.418		0.459		0.265		0.271	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 3. Gauging Intra-regional Trade: Baseline regressions - Merchandise and Services

DEPENDENT VARIABLE	$LTrMRC_{ij}$		$LTrSERV_{ij}$	
EXPLANATORY VARIABLE	coef	tstat	coef	tstat
$LGDP_i$	0.775***	18.71	1.045***	29.33
$LGDP_j$	0.810***	14.34	1.061***	36.23
$LPOP_i$	-0.00271	-0.0535	-0.367***	-8.624
$LPOP_j$	-0.123**	-2.539	-0.366***	-10.54
LDISTANCE	-0.431***	-7.096	-0.600***	-19.07
LANG	0.301***	2.842	0.847***	10.10
BORDER	1.158***	7.030	-0.0321	-0.262
LAC	-0.0982	-0.597	-0.183*	-1.807
intra-LAC	-0.426**	-1.991	-0.521***	-3.149
$LANDLL_i$	-0.139	-1.271	-0.287**	-2.464
$LANDLL_j$	-0.287***	-2.622	-0.170	-1.321
Constant	-12.79***	-9.821	-23.59***	-32.90
Observations	21,010		13,687	
R-squared	0.459		0.751	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 4. Gravity model regressions with Trade Policy Variables - Merchandise and Services Trade

DEPENDENT VARIABLE	$LTrMRC_{ij}$				$LTrSERV_{ij}$			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.770***	19.72	0.765***	20.96	1.046***	29.50	1.047***	29.66
$LGDP_j$	0.803***	15.33	0.638***	11.26	1.063***	36.65	1.001***	18.33
$LPOP_i$	-0.00619	-0.125	0.0280	0.590	-0.369***	-8.661	-0.368***	-8.783
$LPOP_j$	-0.125***	-2.705	0.0808	1.307	-0.368***	-10.67	-0.306***	-5.370
LDISTANCE	-0.426***	-7.193	-0.348***	-5.457	-0.596***	-19.26	-0.582***	-13.86
LANG	0.327***	3.308	0.278***	2.737	0.841***	10.21	0.835***	10.21
BORDER	1.098***	7.462	0.832***	6.566	-0.0330	-0.273	-0.0354	-0.300
RTA			0.662***	6.793			0.0474	0.560
TRI_j			-0.292*	-1.671			-0.0413	-0.385
$MFNT_j$			-0.0393**	-1.972			-0.0320*	-1.843
SA	-0.436***	-5.211	-0.413***	-4.348	-0.271**	-2.439	-0.207*	-1.924
CA	-0.615***	-4.433	-0.808***	-6.374	-0.0767	-0.885	-0.0892	-0.959
MEX	0.403**	2.381	0.00828	0.0363	-0.131	-0.565	-0.196	-0.843
CAR	-0.785***	-4.469	-0.718***	-4.946	-0.443***	-2.834	-0.402***	-2.597
$LANDLL_i$	-0.144	-1.321	-0.0967	-0.934	-0.286**	-2.462	-0.284**	-2.464
$LANDLL_j$	-0.287***	-2.647	-0.236**	-2.395	-0.168	-1.307	-0.155	-1.239
Constant	-12.52***	-9.829	-11.79***	-11.76	-23.64***	-33.34	-22.99***	-22.55
Observations	21,010		21,010		13,687		13,687	
R-squared	0.495		0.555		0.752		0.752	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 5. Gravity model regressions with Trade Policy Variables - Manufacturing and Primary Commodities Trade

DEPENDENT VARIABLE	**$LTrMANU_{ij}$**				**$LTrPRIPD_{ij}$**			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.806***	18.05	0.800***	18.96	0.600***	13.31	0.601***	13.45
$LGDP_j$	0.843***	13.55	0.632***	9.814	0.623***	13.57	0.645***	7.692
$LPOP_i$	0.0150	0.269	0.0591	1.121	-0.0991*	-1.869	-0.0949*	-1.830
$LPOP_j$	-0.180***	-3.405	0.0836	1.198	0.132**	2.264	0.0939	1.033
LDISTANCE	-0.442***	-6.939	-0.357***	-5.205	-0.364***	-6.070	-0.322***	-4.360
LANG	0.334***	3.008	0.275**	2.409	0.234*	1.650	0.243*	1.733
BORDER	1.079***	6.829	0.777***	5.621	1.176***	6.442	1.053***	5.505
RTA			0.756***	7.125			0.286	1.627
TRI_j			-0.412**	-2.043			0.186	0.913
$MFNT_j$			-0.0410*	-1.862			-0.0348	-1.261
SA	-0.524***	-6.575	-0.513***	-5.370	-0.0847	-0.424	-0.0494	-0.216
CA	-0.474***	-3.295	-0.707***	-5.412	-1.255***	-5.256	-1.304***	-5.440
MEX	0.509***	2.755	0.0258	0.100	-0.221	-0.624	-0.251	-0.704
CAR	-0.739***	-4.044	-0.671***	-4.818	-1.189***	-4.794	-1.148***	-4.564
$LANDLL_i$	0.0256	0.210	0.0816	0.699	-0.946***	-5.882	-0.928***	-5.767
$LANDLL_j$	-0.238**	-2.021	-0.167	-1.596	-0.760***	-5.374	-0.751***	-5.274
Constant	-13.81***	-9.227	-12.74***	-11.11	-9.333***	-8.072	-10.06***	-5.777
Observations	21,010		21,010		21,010		21,010	
R-squared	0.459		0.523		0.271		0.281	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 6. Gravity model regressions with Trade Policy Variables and NAFTA - Manufacturing and Primary Commodities Trade

DEPENDENT VARIABLE	$LTrMANU_{ij}$				$LTrPRIPD_{ij}$			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.800***	18.96	0.799***	18.51	0.601***	13.45	0.575***	13.47
$LGDP_j$	0.632***	9.814	0.631***	10.39	0.645***	7.692	0.624***	7.503
$LPOP_i$	0.0591	1.121	0.0596	1.151	-0.0949*	-1.830	-0.0806	-1.604
$LPOP_j$	0.0836	1.198	0.0840	1.233	0.0939	1.033	0.0980	1.134
LDISTANCE	-0.357***	-5.205	-0.358***	-5.181	-0.322***	-4.360	-0.351***	-4.763
LANG	0.275**	2.409	0.272**	2.322	0.243*	1.733	0.109	0.856
BORDER	0.777***	5.621	0.771***	5.375	1.053***	5.505	0.834***	4.483
RTA	0.756***	7.125	0.755***	7.114	0.286	1.627	0.261	1.473
TRI_j	-0.412**	-2.043	-0.411**	-2.012	0.186	0.913	0.246	1.318
$MFNT_j$	-0.0410*	-1.862	-0.0412*	-1.900	-0.0348	-1.261	-0.0421	-1.535
SA	-0.513***	-5.370	-0.512***	-5.326	-0.0494	-0.216	-0.0218	-0.0949
CA	-0.707***	-5.412	-0.707***	-5.414	-1.304***	-5.440	-1.309***	-5.464
MEX	0.0258	0.100	0.0159	0.0733	-0.251	-0.704	-0.663**	-2.318
CAR	-0.671***	-4.818	-0.672***	-4.800	-1.148***	-4.564	-1.156***	-4.602
NAFTA			0.0258	0.120			1.142***	4.436
$LANDLL_i$	0.0816	0.699	0.0830	0.723	-0.928***	-5.767	-0.889***	-5.792
$LANDLL_j$	-0.167	-1.596	-0.166	-1.574	-0.751***	-5.274	-0.723***	-4.920
Constant	-12.74***	-11.11	-12.71***	-11.33	-10.06***	-5.777	-9.085***	-5.113
Observations	21,010		21,010		21,010		21,010	
R-squared	0.523		0.524		0.281		0.377	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 7. Gravity model regressions with Transport and Customs Variables - Merchandise and Services Trade

DEPENDENT VARIABLE	**$LTrMRC_{ij}$**				**$LTrSERV_{ij}$**			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.758***	20.55	0.435***	4.454	1.045***	28.76	1.008***	12.84
$LGDP_j$	0.633***	10.91	0.363***	3.345	1.005***	18.07	1.072***	10.76
$LPOP_i$	0.0255	0.523	0.240***	2.870	-0.367***	-8.602	-0.307***	-4.684
$LPOP_j$	0.0834	1.337	0.294***	3.947	-0.308***	-5.329	-0.353***	-4.155
LDISTANCE	-0.342***	-5.359	-0.290***	-4.573	-0.581***	-13.74	-0.609***	-13.28
LANG	0.293***	2.862	0.372***	3.673	0.838***	10.14	0.799***	9.806
BORDER	0.835***	6.570	0.886***	6.700	-0.0363	-0.307	-0.0327	-0.270
RTA	0.648***	6.703	0.591***	6.719	0.0467	0.549	0.0177	0.201
TRI_j	-0.297*	-1.702	-0.396***	-2.740	-0.0399	-0.368	0.0309	0.272
$MFNT_j$	-0.0382*	-1.912	-0.0281	-1.504	-0.0317*	-1.809	-0.0293	-1.621
SA	-0.427***	-4.469	-0.217**	-2.199	-0.206*	-1.902	-0.116	-1.029
CA	-0.886***	-6.476	-0.674***	-4.592	-0.0899	-0.928	-0.0447	-0.449
MEX	0.00948	0.0412	0.347	1.315	-0.193	-0.824	-0.190	-0.839
CAR	-0.693***	-4.773	-0.285	-1.636	-0.431**	-2.290	-0.452**	-2.394
$LANDLL_i$	-0.0885	-0.824	-0.185*	-1.684	-0.286**	-2.452	-0.190*	-1.714
$LANDLL_j$	-0.226**	-2.253	-0.269***	-2.624	-0.150	-1.186	-0.108	-0.859
$LPITRANS_i$			3.602***	3.666			-2.225***	-3.466
$LPITRANS_j$			2.292**	2.533			-1.398*	-1.690
$LPICUST_i$			-1.501**	-2.237			2.748***	5.451
$LPICUST_j$			-0.571	-0.811			1.312**	2.010
Constant	-11.59***	-11.29	-9.140***	-6.867	-23.01***	-22.20	-24.00***	-18.43
Observations	15,453		15,453		11,389		11,389	
R-squared	0.557		0.618		0.751		0.754	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 8. Gravity model regressions with Transport and Customs Variables - Manufacturing and Primary Commodities Trade

DEPENDENT VARIABLE	$LTrMANU_{ij}$				$LTrPRIPD_{ij}$			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.792***	18.59	0.162	1.532	0.596***	13.08	1.383***	13.86
$LGDP_j$	0.627***	9.519	0.442***	3.632	0.645***	7.461	0.0873	0.644
$LPOP_i$	0.0596	1.106	0.510***	5.788	-0.122**	-2.237	-0.736***	-9.376
$LPOP_j$	0.0867	1.233	0.227***	2.603	0.0923	0.993	0.532***	4.874
LDISTANCE	-0.352***	-5.124	-0.287***	-4.378	-0.307***	-4.167	-0.314***	-4.131
LANG	0.286**	2.493	0.389***	3.456	0.277*	1.956	0.320**	2.160
BORDER	0.779***	5.621	0.841***	5.841	1.068***	5.636	0.988***	5.544
RTA	0.742***	7.038	0.651***	6.870	0.271	1.539	0.505***	2.982
TRI_j	-0.418**	-2.077	-0.482***	-2.997	0.190	0.923	0.112	0.563
$MFNT_j$	-0.0400*	-1.819	-0.0327	-1.591	-0.0331	-1.200	0.00227	0.0871
SA	-0.527***	-5.489	-0.162*	-1.704	-0.0686	-0.297	-0.220	-1.102
CA	-0.784***	-5.754	-0.433***	-2.991	-1.406***	-5.121	-1.360***	-4.868
MEX	0.0256	0.0989	0.502	1.633	-0.235	-0.651	-0.143	-0.384
CAR	-0.678***	-4.857	-0.110	-0.610	-0.974***	-3.790	-0.953***	-3.464
$LANDLL_i$	0.106	0.880	0.00646	0.0555	-1.064***	-6.146	-0.944***	-4.449
$LANDLL_j$	-0.160	-1.512	-0.215**	-1.990	-0.723***	-4.966	-0.758***	-4.888
$LPITRANS_i$			4.453***	3.809			0.358	0.383
$LPITRANS_j$			2.048**	2.178			3.330**	2.425
$LPICUST_i$			-0.0688	-0.0856			-5.203***	-6.913
$LPICUST_j$			-0.763	-1.018			0.703	0.641
Constant	-12.53***	-10.71	-9.707***	-6.507	-9.774***	-5.508	-12.22***	-6.256
Observations	15,453		15,453		15,453		15,453	
R-squared	0.525		0.625		0.292		0.347	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 9. Gravity model regressions with Transport and Customs Variables and Digital Infrastructure - Merchandise and Services Trade

DEPENDENT VARIABLE	$LTrMRC_{ij}$				$LTrSERV_{ij}$			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.439***	4.428	0.381***	3.927	0.997***	12.64	0.934***	11.51
$LGDP_j$	0.377***	3.267	0.254**	2.342	1.085***	10.58	0.920***	7.767
$LPOP_i$	0.249***	2.909	0.308***	3.655	-0.302***	-4.543	-0.226***	-3.114
$LPOP_j$	0.279***	3.527	0.404***	4.831	-0.361***	-4.128	-0.189*	-1.747
LDISTANCE	-0.252***	-3.589	-0.269***	-3.688	-0.645***	-11.97	-0.689***	-12.83
LANG	0.312***	3.142	0.317***	3.328	0.819***	9.989	0.837***	10.58
BORDER	0.966***	7.269	0.990***	7.710	-0.0691	-0.563	-0.0507	-0.420
RTA	0.646***	6.871	0.670***	7.413	-0.0517	-0.507	-0.0173	-0.170
TRI_j	-0.437***	-2.942	-0.499***	-3.253	0.0624	0.530	-0.0369	-0.313
$MFNT_j$	-0.0375	-1.614	-0.0405*	-1.848	-0.0274	-1.307	-0.0268	-1.383
SA	-0.199*	-1.791	-0.203*	-1.846	-0.108	-0.958	-0.136	-1.298
CA	-0.660***	-4.361	-0.635***	-4.305	-0.0337	-0.323	-0.0647	-0.594
CAR	-0.289	-1.596	-0.219	-1.236	-0.464**	-2.345	-0.396**	-2.115
MEX	0.282	1.054	0.258	0.991	-0.135	-0.569	-0.175	-0.793
$LANDLL_i$	-0.106	-0.957	-0.0799	-0.706	-0.204*	-1.809	-0.164	-1.422
$LANDLL_j$	-0.233**	-2.303	-0.195*	-1.948	-0.107	-0.848	-0.0613	-0.495
$LPITRANS_i$	3.344***	3.276	3.304***	3.161	-2.128***	-3.245	-2.249***	-3.611
$LPITRANS_j$	2.149**	2.306	2.398***	2.637	-1.506*	-1.787	-1.269	-1.470
$LPICUST_i$	-1.252*	-1.766	-1.244*	-1.752	2.650***	5.135	2.531***	4.896
$LPICUST_j$	-0.592	-0.796	-0.837	-1.144	1.444**	2.146	1.090	1.557
$MBUSERS_i$			0.00287*	1.648			0.00447***	2.920
$MBUSERS_j$			0.00401**	2.333			0.00584***	3.540
Constant	-9.496***	-6.558	-8.003***	-5.636	-23.79***	-17.63	-21.59***	-15.45
Observations	14,058		14,058		10,558		10,558	
R-squared	0.636		0.636		0.760		0.766	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 10. Gravity model regressions with Factor Input Variables - Merchandise and Services Trade

DEPENDENT VARIABLE	**$LTrMRC_{ij}$**				**$LTrSERV_{ij}$**			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.855***	23.55	0.690***	12.79	0.953***	30.65	1.038***	21.80
$LGDP_j$	0.606***	10.98	0.620***	11.47	0.963***	20.08	0.958***	21.50
$LPOP_i$	-0.0718	-1.637	0.0970	1.567	-0.346***	-9.297	-0.453***	-8.308
$LPOP_j$	0.0570	1.100	0.0528	1.000	-0.307***	-5.420	-0.297***	-5.595
LDISTANCE	-0.307***	-3.127	-0.312***	-3.011	-0.680***	-12.65	-0.696***	-12.38
LANG	0.425***	3.253	0.508***	4.239	0.486***	4.365	0.446***	3.842
BORDER	0.862***	5.197	0.854***	5.267	0.298***	2.847	0.322***	3.071
RTA	0.573***	4.798	0.623***	5.317	-0.0225	-0.259	-0.0146	-0.170
TRI_j	-0.388***	-3.087	-0.425***	-3.594	-0.0831	-0.915	-0.136	-1.489
$MFNT_j$	-0.0118	-1.018	-0.0111	-1.059	0.00506	0.620	-0.000259	-0.0274
SA	-0.311**	-2.140	-0.271*	-1.781	-0.339***	-4.237	-0.215**	-2.366
CA	-0.931***	-5.726	-0.869***	-5.205	-0.280***	-3.616	-0.368***	-4.327
MEX	-0.431	-1.608	-0.374	-1.330	-0.334**	-2.317	-0.269*	-1.776
CAR	-0.975***	-5.139	-0.926***	-4.872	-0.562***	-6.355	-0.508***	-5.696
$LANDLL_i$	0.0440	0.431	-0.0714	-0.736	-0.233**	-2.146	-0.195*	-1.712
$LANDLL_j$	-0.144	-1.466	-0.141	-1.479	-0.417***	-4.902	-0.389***	-4.288
$BESFIN_i$			0.00263	0.511			-0.00413	-1.221
$BESFIN_j$			0.00413	1.124			0.00866**	2.551
HCI_i			0.483***	3.730			-0.401***	-4.272
$BESELEC_i$			-0.00807***	-3.212			-0.00154	-0.680
$BESELEC_j$			-0.00248	-1.042			-0.00772***	-2.779
Constant	-12.00***	-11.39	-11.90***	-10.08	-19.86***	-23.04	-18.86***	-20.37
Observations	10,350		10,350		8,501		8,501	
R-squared	0.509		0.520		0.714		0.716	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 11. Gravity model regressions with Factor Input Variables - Manufacturing and Primary Commodities Trade

DEPENDENT VARIABLE	**$LTrMANU_{ij}$**				**$LTrPRIPD_{ij}$**			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.961***	23.02	0.713***	14.13	0.486***	10.06	0.490***	4.022
$LGDP_j$	0.605***	10.10	0.643***	11.04	0.615***	6.659	0.567***	6.447
$LPOP_i$	-0.0997**	-2.222	0.110**	1.982	0.0315	0.578	0.138	0.931
$LPOP_j$	0.0389	0.699	0.00323	0.0588	0.135	1.395	0.182*	1.928
LDISTANCE	-0.298***	-2.992	-0.327***	-3.106	-0.394***	-3.698	-0.389***	-3.651
LANG	0.376***	2.618	0.418***	3.159	0.704***	3.738	0.897***	4.964
BORDER	0.766***	4.550	0.765***	4.556	1.293***	5.179	1.208***	6.009
RTA	0.798***	6.536	0.835***	6.887	-0.398*	-1.885	-0.213	-1.167
TRI_j	-0.427***	-3.235	-0.413***	-3.328	-0.232	-0.788	-0.427	-1.595
$MFNT_j$	0.000663	0.0654	-0.00612	-0.594	-0.0802*	-1.892	-0.0297	-1.030
SA	-0.429***	-3.378	-0.260*	-1.799	0.265	0.715	0.0199	0.0705
CA	-0.776***	-4.578	-0.776***	-4.367	-1.803***	-9.665	-1.518***	-7.315
MEX	-0.355	-1.196	-0.188	-0.633	-0.919***	-3.180	-0.910***	-3.338
CAR	-1.092***	-5.249	-0.995***	-4.819	-0.811***	-3.141	-1.006***	-3.548
$LANDLL_i$	0.174	1.614	-0.0895	-0.922	-0.535**	-2.514	-0.408**	-2.003
$LANDLL_j$	-0.0837	-0.855	-0.0608	-0.635	-0.445**	-1.983	-0.567***	-2.831
$BESFIN_i$			-0.0180***	-3.711			0.0397***	5.806
$BESFIN_j$			0.00618	1.634			-0.00336	-0.465
HCI_i			0.435***	4.020			0.702**	2.053
$BESELEC_i$			-0.00578**	-2.300			-0.00984**	-2.184
$BESELEC_j$			-0.000336	-0.134			-0.0129***	-3.053
Constant	-14.04***	-12.40	-12.42***	-10.64	-7.321***	-3.837	-10.20***	-5.357
Observations	10,350		10,350		10,350		10,350	
R-squared	0.553		0.564		0.163		0.289	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 12. Gravity model regressions with Governance Indicators - Merchandise and Services Trade

DEPENDENT VARIABLE	$LTrMRC_{ij}$				$LTrSERV_{ij}$			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.859***	24.20	0.758***	16.35	0.968***	31.47	0.916***	25.92
$LGDP_j$	0.601***	10.72	0.578***	10.28	0.963***	20.08	0.934***	19.62
$LPOP_i$	-0.0737*	-1.673	-0.0127	-0.235	-0.352***	-9.464	-0.306***	-7.417
$LPOP_j$	0.0582	1.112	0.0677	1.180	-0.308***	-5.451	-0.279***	-5.082
LDISTANCE	-0.313***	-3.204	-0.337***	-3.212	-0.673***	-12.94	-0.685***	-12.42
LANG	0.414***	3.181	0.381***	3.149	0.488***	4.435	0.461***	3.912
BORDER	0.876***	5.317	0.886***	5.237	0.310***	2.968	0.310***	2.966
RTA	0.575***	4.833	0.594***	4.977	0.00717	0.0861	0.0486	0.596
TRI_j	-0.369***	-2.931	-0.379***	-3.176	-0.0625	-0.692	-0.0790	-0.876
$MFNT_j$	-0.0145	-1.238	-0.0114	-0.990	0.00391	0.482	0.00814	0.804
SA	-0.302**	-2.075	-0.00469	-0.0254	-0.330***	-4.191	-0.143	-1.321
CA	-0.924***	-5.746	-0.841***	-4.730	-0.265***	-3.457	-0.195**	-2.326
MEX	-0.419	-1.566	-0.210	-0.761	-0.339**	-2.374	-0.231	-1.525
CAR	-0.993***	-5.139	-0.982***	-4.851	-0.584***	-6.709	-0.546***	-6.073
$LANDLL_i$	0.0327	0.332	-0.118	-1.210	-0.232**	-2.173	-0.275**	-2.415
$LANDLL_j$	-0.151	-1.547	-0.196**	-1.995	-0.415***	-4.914	-0.445***	-4.924
$BESGOVAvg_i$			-0.00873***	-2.988			-0.00473***	-2.599
$BESGOVAvg_j$			-0.00307	-1.162			-0.00300	-1.490
Constant	-11.94***	-11.49	-9.722***	-8.560	-20.20***	-24.22	-19.10***	-19.79
Observations	12,638		12,638		9,704		9,704	
R-squared	0.508		0.499		0.713		0.708	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 13. Gravity model regressions with Governance Indicators - Manufacturing and Primary Commodities Trade

DEPENDENT VARIABLE	**$LTrMANU_{ij}$**				**$LTrPRIPD_{ij}$**			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.965***	23.54	0.783***	18.01	0.501***	10.64	0.601***	8.081
$LGDP_j$	0.602***	9.891	0.619***	10.29	0.603***	6.528	0.476***	5.201
$LPOP_i$	-0.103**	-2.297	0.00941	0.189	0.0367	0.670	-0.0374	-0.480
$LPOP_j$	0.0382	0.680	0.00702	0.118	0.142	1.480	0.233**	2.415
LDISTANCE	-0.303***	-3.058	-0.345***	-3.269	-0.404***	-3.782	-0.421***	-3.954
LANG	0.363**	2.539	0.330**	2.549	0.702***	3.775	0.664***	3.471
BORDER	0.781***	4.669	0.794***	4.643	1.282***	5.223	1.295***	5.340
RTA	0.805***	6.592	0.845***	7.037	-0.389*	-1.879	-0.368*	-1.784
TRI_j	-0.406***	-3.058	-0.379***	-3.097	-0.219	-0.757	-0.357	-1.306
$MFNT_j$	-0.00126	-0.124	-0.00431	-0.405	-0.0866**	-2.056	-0.0383	-1.118
SA	-0.420***	-3.317	-0.0411	-0.244	0.282	0.764	0.252	0.826
CA	-0.774***	-4.597	-0.668***	-3.590	-1.752***	-9.616	-1.739***	-8.852
MEX	-0.342	-1.149	-0.0510	-0.174	-0.925***	-3.209	-0.773***	-2.927
CAR	-1.071***	-5.153	-1.030***	-4.731	-0.960***	-3.690	-0.908***	-3.546
$LANDLL_i$	0.141	1.338	-0.126	-1.255	-0.435**	-2.233	-0.297	-1.474
$LANDLL_j$	-0.0886	-0.907	-0.0923	-0.935	-0.453**	-2.068	-0.691***	-3.258
$BESGOVAvg_i$			-0.0157***	-6.370			0.00851*	1.907
$BESGOVAvg_j$			-0.000103	-0.0406			-0.0144***	-2.967
Constant	-13.99***	-12.46	-10.90***	-9.689	-7.432***	-3.992	-6.785***	-3.388
Observations	12,638		12,638		12,638		12,638	
R-squared	0.552		0.558		0.156		0.191	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 14. Robustness regressions with Transport and Customs Variables - Merchandise and Services Trade

DEPENDENT VARIABLE	$LTrMRC_{ij}$				$LTrSERV_{ij}$			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.860***	24.40	0.871***	17.51	0.967***	31.65	0.963***	25.68
$LGDP_j$	0.604***	10.97	0.598***	10.56	0.963***	20.24	0.991***	19.14
$LPOP_i$	-0.0735*	-1.670	-0.0963*	-1.919	-0.352***	-9.487	-0.348***	-8.490
$LPOP_j$	0.0555	1.069	0.0534	0.968	-0.308***	-5.470	-0.308***	-5.323
LDISTANCE	-0.314***	-3.213	-0.321***	-3.129	-0.672***	-12.96	-0.649***	-12.35
LANG	0.415***	3.200	0.406***	3.435	0.490***	4.473	0.497***	4.333
BORDER	0.876***	5.304	0.898***	5.329	0.310***	2.964	0.358***	3.527
RTA	0.574***	4.837	0.588***	4.929	0.00882	0.106	0.0676	0.813
TRI_j	-0.367***	-2.915	-0.380***	-3.148	-0.0629	-0.698	-0.111	-1.194
$MFNT_j$	-0.0143	-1.223	-0.00905	-0.766	0.00385	0.475	-0.0180*	-1.721
SA	-0.300**	-2.072	-0.199	-1.229	-0.332***	-4.220	-0.289***	-3.143
CA	-0.920***	-5.750	-0.883***	-5.187	-0.267***	-3.503	-0.170**	-1.976
MEX	-0.417	-1.559	-0.305	-1.170	-0.342**	-2.395	-0.219	-1.331
CAR	-0.990***	-5.135	-1.035***	-5.167	-0.586***	-6.741	-0.613***	-6.541
$LANDLL_i$	0.0333	0.338	-0.0415	-0.413	-0.232**	-2.174	-0.244**	-2.184
$LANDLL_j$	-0.148	-1.526	-0.176*	-1.821	-0.415***	-4.918	-0.411***	-4.670
$BESTRANS_i$			-0.0161***	-3.167			-0.00484	-1.047
$BESTRANS_j$			-0.000897	-0.182			-0.0167***	-2.626
$BESCUST_i$			0.00979	1.095			0.000281	0.0511
$BESCUST_j$			-0.00519	-0.685			0.0260***	2.642
Constant	-12.00***	-11.65	-11.57***	-9.771	-20.19***	-24.31	-20.67***	-21.76
Observations	12,870		12,870		9,900		9,900	
R-squared	0.507		0.504		0.713		0.709	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 15. Robustness regressions with Factor Input Variables - Merchandise and Services Trade

DEPENDENT VARIABLE	**$LTrMRC_{ij}$**				**$LTrSERV_{ij}$**			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.860***	24.40	0.753***	19.20	0.967***	31.65	0.977***	25.05
$LGDP_j$	0.604***	10.97	0.619***	11.47	0.963***	20.24	0.963***	21.28
$LPOP_i$	-0.0735*	-1.670	0.00193	0.0407	-0.352***	-9.487	-0.361***	-8.222
$LPOP_j$	0.0555	1.069	0.0442	0.834	-0.308***	-5.470	-0.299***	-5.554
LDISTANCE	-0.314***	-3.213	-0.316***	-3.059	-0.672***	-12.96	-0.669***	-12.94
LANG	0.415***	3.200	0.454***	4.023	0.490***	4.473	0.514***	4.556
BORDER	0.876***	5.304	0.878***	5.411	0.310***	2.964	0.337***	3.164
RTA	0.574***	4.837	0.611***	5.208	0.00882	0.106	0.0436	0.538
TRI_j	-0.367***	-2.915	-0.395***	-3.339	-0.0629	-0.698	-0.124	-1.356
$MFNT_j$	-0.0143	-1.223	-0.0131	-1.261	0.00385	0.475	-0.00122	-0.128
SA	-0.300**	-2.072	-0.321**	-2.141	-0.332***	-4.220	-0.235***	-2.683
CA	-0.920***	-5.750	-1.064***	-6.239	-0.267***	-3.503	-0.240***	-2.970
MEX	-0.417	-1.559	-0.309	-1.125	-0.342**	-2.395	-0.335**	-2.214
CAR	-0.990***	-5.135	-1.022***	-5.190	-0.586***	-6.741	-0.518***	-5.817
$LANDLL_i$	0.0333	0.338	-0.0747	-0.755	-0.232**	-2.174	-0.223**	-1.980
$LANDLL_j$	-0.148	-1.526	-0.136	-1.418	-0.415***	-4.918	-0.387***	-4.329
$BESFIN_i$			-0.00461	-1.032			-0.000350	-0.107
$BESFIN_j$			0.00470	1.293			0.00908***	2.724
$BESSKLAB_i$			0.0118***	3.145			-0.00383	-1.211
$BESELEC_i$			-0.0150***	-5.326			0.00111	0.418
$BESELEC_j$			-0.00290	-1.263			-0.00774***	-2.798
Constant	-12.00***	-11.65	-10.62***	-9.939	-20.19***	-24.31	-20.19***	-22.12
Observations	12,870		12,870		9,900		9,900	
R-squared	0.507		0.521		0.713		0.711	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 16. Robustness regressions with Governance Indicators - Merchandise and Services Trade

DEPENDENT VARIABLE	$LTrMRC_{ij}$				$LTrSERV_{ij}$			
EXPLANATORY VARIABLE	coef	tstat	coef	tstat	coef	tstat	coef	tstat
$LGDP_i$	0.764***	20.99	0.742***	11.08	1.047***	29.66	0.938***	15.31
$LGDP_j$	0.637***	11.26	0.544***	7.050	1.001***	18.33	0.916***	13.58
$LPOP_i$	0.0265	0.557	0.0484	0.720	-0.368***	-8.783	-0.248***	-3.633
$LPOP_j$	0.0809	1.311	0.183**	2.347	-0.306***	-5.370	-0.211***	-2.884
LDISTANCE	-0.348***	-5.460	-0.350***	-5.556	-0.582***	-13.86	-0.586***	-13.82
LANG	0.278***	2.733	0.263**	2.567	0.835***	10.21	0.818***	9.885
BORDER	0.833***	6.579	0.838***	6.595	-0.0354	-0.300	-0.0368	-0.309
RTA	0.661***	6.793	0.646***	6.719	0.0474	0.560	0.0365	0.426
TRI_j	-0.292*	-1.672	-0.292	-1.638	-0.0413	-0.385	-0.0460	-0.434
$MFNT_j$	-0.0393**	-1.971	-0.0375*	-1.844	-0.0320*	-1.843	-0.0304*	-1.704
SA	-0.414***	-4.358	-0.385***	-3.990	-0.207*	-1.924	-0.162	-1.507
CA	-0.811***	-6.384	-0.789***	-6.361	-0.0892	-0.959	-0.0397	-0.422
MEX	0.00835	0.0366	0.101	0.426	-0.196	-0.843	-0.0730	-0.310
CAR	-0.723***	-4.952	-0.692***	-4.757	-0.402***	-2.597	-0.344**	-2.246
$LANDLL_i$	-0.101	-0.973	-0.105	-0.996	-0.284**	-2.464	-0.287**	-2.492
$LANDLL_j$	-0.237**	-2.397	-0.256**	-2.541	-0.155	-1.239	-0.161	-1.288
$WGIGOVAvg_i$			0.0246	0.454			0.110**	2.399
$WGIGOVAvg_j$			0.102*	1.849			0.0877*	1.787
Constant	-11.77***	-11.72	-10.82***	-8.669	-22.99***	-22.55	-21.44***	-18.87
Observations	20,460		20,460		13,687		13,687	
R-squared	0.556		0.557		0.752		0.749	

Source: Authors' calculations.

Note: t-statistics calculated using robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

References

Baldwin, R. and D. Taglioni (2006), “Gravity for Dummies and Dummies for Gravity Equations,” NBER Working Paper 12516.

Behar, A., P. Manners, and B.D. Nelson (2013), “Exports and International Logistics”, Oxford Bulletin of Economics and Statistics, Vol. 75 Issue 6, December 2013.

Bown, C.P., D. Lederman, S. Pienknagura and R. Robertson (2017), “Better Neighbors: Toward a Renewal of Economic Integration in Latin America”, The World Bank Group, Washington, D.C., U.S.A.

Campos, R., S. Pienknagura, and J. Timini (2023), “How Far has Globalization Gone? A Tale of Two Regions,” IMF Working Paper WP/23/255.

Moreira, M.M., J. Blyde, C. Vulpe, and (2013, eds.), “Too Far to Export: Domestic Transport Costs and Regional Export Disparities in Latin America and the Caribbean”, Inter-American Development Bank, Washington, D.C., U.S.A.

Cerra, V. et al. (2017), “Cluster Report – Trade Integration in Latin America and the Caribbean”, IMF Country Report No. 17/66, March 2017, International Monetary Fund, Washington, D.C., U.S.A.

Conte, M. P. Cotterlaz and T. Mayer, 2022. "The CEPII Gravity Database," Working Papers 2022-05, CEPII research center

Estefania-Flores J., D. Furceri, S.A. Hannan, J.D. Ostry, and A.K. Rose (2022), “A Measurement of Aggregate Trade Restrictions and their Economic Effects”, IMF Working Paper No. 2022/001.

Felbermayr, G., and Y. Yotov (2021), “From Theory to Policy with Gravitas: A Solution to the Mystery of the Excess Trade Balances”, European Economic Review, Vol. 139:103875.

International Monetary Fund (October 2015), Regional Economic Outlook, Western Hemisphere Department, “Trade Integration in Latin America and the Caribbean: Hype, Hope, and Reality”, International Monetary Fund, Washington, D.C., U.S.A.

Kahn, T., A. Estevadeordal, and M. M. Moreira (2015), “Bringing Down the Barriers: A Review of IDB Research on Trade Costs in Latin American and the Caribbean”, Inter-American Development Bank, Washington, D.C., U.S.A.

Liberatore, A., and S. Wettstein (2021), “THE OECD-WTO BALANCED TRADE IN SERVICES DATABASE (BaTIS)”: https://www.oecd.org/sdd/its/OECD-WTO-Balanced-Trade-in-Services-database-methodology-BPM6.pdf

Moreira, M.M., C. Vulpe, and J. Blyde (2008), “Unclogging the Arteries: The Impact of Transport Costs on Latin American and Caribbean Trade”, Inter-American Development Bank, Washington, D.C., U.S.A.

Moreira, M.M., J. Blyde, C. Vulpe, and (2013, eds.), “Too Far to Export: Domestic Transport Costs and Regional Export Disparities in Latin America and the Caribbean”, Inter-American Development Bank, Washington, D.C., U.S.A.

Mowatt, R. (2017) “Trade Policy Issues in Latin America and the Caribbean: Views from Country Authorities and Current State of Play”, unpublished background paper, International Monetary Fund, Washington, D.C., U.S.A.

Salinas, G. (2021) “Proximity and Horizontal Policies: The Backbone of Export Diversification and Complexity,” IMF Working Paper No. 2021/064.

Santos Silva, J.M.C, and S. Tenreyro (2006), “The log of Gravity,” The Review of Economics and Statistics, Vol. 88 (4): 641-658.

Santos Silva, J.M.C, and S. Tenreyro (2011), “Further simulation evidence on the performance of the Poisson pseudo-maximum likelihood estimator,” Economics Letters, Vol. 112 (2): 220-222.

PUBLICATIONS